THEIVANAI AMMAL COLLEGE FOR WOMEN

(AUTONOMOUS)

(Permanently Affiliated to the Thiruvalluvar University - Vellore)
(Re-Accredited by NAAC (3rd Cycle) with CGPA of 3.2/4 at 'A' Grade)
(Recognized under 2(f) and 12(B) by UGC)
Villupuram, Tamilnadu

ACADEMIC COUNCIL BOOKLET - XIII

IQAC, Arts & Science (Master Copy)

2021 - 2022

Internal Quality Assurance Cell

I. UG PROGRAMME PROFILE – Allotment of Hours

(With effect from 2021-2024 Batch onwards)

Learning Outcome Based Curriculum Framework (LOCF)

PREAMBLE: Programme Profile for UG & PG are presented in this Booklet

Components	I Sem	II Sem	III Sem	IV Sem	V Sem	VI Sem
Part I Languages/AECC-II Tamil/Hindi/French (2 Levels)	5	5	5	5	-	-
Part II English for Communication Stream - I / Stream - II /AECC-I (2 Levels)	5	5	5	5	-	-
Part III Major Core /(DSC)	12	11	12	9	18	23
Allied/(GE)	6	6	6	6	-	-
Major Elective/(DSE)	-	-	-	-	5	5
Professional English	6	6	-	-	-	-
Project/ Core Paper	-	-	-	-	5	-
Part IV Non Major Elective/(SEC)	-	3	-	3	-	-
Online Course*	Depends upon the department choice.					
Value Education/(SEC)	2	-	2	-	2	-
Soft Skill/(SEC)	-	-	-	2	-	2
Part V Extension Activity/ Physical Education (outside class hours)	60 Hours (Compulsory)		60 Hours (Optional)		60 Hours (Optional)	
Total Hours	**36**	**36**	**30**	**30**	**30**	**30**
Not more than Seven Courses per Semester for Arts and Eight Courses per Semester for Science. ***Three hours for Online Course has to be taken from part III in the respective Semesters as given in the Profile.**						

UG PROGRAMME PROFILE – Allotment of Credits

(With effect from 2021-2024 Batch onwards)

Learning Outcome Based Curriculum Framework (LOCF)

Components	Two Year Language Programme B.A., B.Sc.,		One Year Language PROGRAMME B.B.A., B.Com., BCA.,	
	Credit per Semester	Total Credit	Credit per Semester	Total Credit
Part I Languages/AECC-II Tamil/Hindi/French (2 Levels)	3/4	12/16	3/4	6/8
Part II English for Communication Stream - I / Stream - II /AECC-I (2 Levels)	3/4	12/16	3/4	6/8
Part III Major Core /(DSC)	Depends upon the courses	75	Depends upon the courses	87
Allied/(GE)	4	16	4	16
Major Elective/(DSE)	4	8	4	8
Professional English	4	8	4	8
Project	5	5	5	5
Comprehensive viva	1	1	1	1
Summer Internship	1(Per Year)	2 (Extra)	1(Per Year)	2 (Extra)
Part IV Non Major Elective/(SEC)	2	4	2	4
Value Education/(SEC)	1	3	1	3
Soft Skill/(SEC)	1	2	1	2
Online Course	1/2	1/2	1/2	1/2
Part V Extension	1/2	1/6	1/2	1/6
Total		**148/164**		**148/160**

II. PG PROGRAMME PROFILE – Allotment of Hours

(With effect from 2021-2023 Batches onwards)

Learning Outcome Based Curriculum Framework (LOCF)

Components	I Semester	II Semester	III Semester	IV Semester
Major core/ DSC	30	25	18	26
Interdisciplinary/GE	-	-	5	
Research Methodology/AECC	-	-	5	-
Project	-	-	2	4
Non Major Elective/SEC	-	5	-	-
Service Learning (outside class hours)	40 Hrs		-	-
Total Hours	**30**	**30**	**30**	**30**

Minimum one MOOCs Course to be Completed during the First year under Extra Credit Earning Provision.

PG PROGRAMME PROFILE – Allotment of Credits

(With effect from 2021-2023 Batches onwards)

Learning Outcome Based Curriculum Framework (LOCF)

Components	Credit per Semester	Total Credit
Major Core	Depends upon the courses	71
Interdisciplinary/GE	4	4
Research Methodology/AECC	4	4
Project	6	6
Non Major Elective/SEC	4	4
Service learning	1 (one year)	1
Total Credit		**90**

III. ONLINE COURSE

(This will replace the Guidelines given in the Academic Council Booklet IX with Effect from 2021-2024 Batch onwards)

- Passing Minimum – 40 % in the External Examination.
- Credits Allotment - 2 credits can be allotted after Successful Completion of Online Course.
- If a Student gets NC, She has to Redo the course in the next Academic year (odd / even Semester course can appear in odd /even Semester)

IV. UG & PG PROJECT EVALUATION

S.No.	Criteria	Duration	Evaluation	
			CIA (Valuation by Faculty Guide)	**ESE (Average of Internal & External Marks)**
1	Research Proposal - Statement of the Problem, Research Methodology	July - September	10	-
2	Analysis of data/Implementation, Results & Findings, Conclusion	October - November	10	-
3	Preparation of report I Draft II Draft III Draft Final draft	December I Week December II Week December III Week January I Week	10	-
4	Research Publications	December - February	30	-
5	Project report		-	30
6	Viva Voce		-	10
		TOTAL	**60**	**40**

- At each stage Power Point Presentation is to be made for Assessment.
- Project Proposal and Final Project Report are to be Presented in Power Point in the Presence of all Teachers of the Departments and their Class Students.
- Faculty with 2 years of Teaching Experience will be Guiding the PG Students for Projects.
- Emphasis is given to Inter-Disciplinary Projects.

தமிழாய்வுத்துறை
இளங்கலைத்தமிழ்

முகவுரை

ஆறு பருவங்களுக்குரிய பாடத்திட்ட வடிவமைப்பு இடம் பெற்றுள்ளது. **முதல் மற்றும் இரண்டாம்** பருவத்திற்கு உரிய பாடத்திட்டங்கள் மற்றும் அகமதிப்பீட்டுக் கூறுகள் இடம் பெற்றுள்ளன. **இப்பாடத்திட்டமானது 2021 - 2024 ஆம் கல்வியாண்டுகளில் பயிலும் மாணவியர்களுக்கு உரியது.**

பாடத்திட்ட அமைப்பு : இளங்கலைத்தமிழ் (B.A)

பாடத்திட்டப் பயன்கள்

- தமிழ் இலக்கியங்களின் வாயிலாக சமூகத்தை மேம்படுத்துதல்.
- தமிழ் மொழியின் இயல்புகள் உணர்ந்து மொழியியலாளராக தம்மை உருவாக்கிக்கொள்ளுதல்.
- படைப்பிலக்கியங்களின் தன்மைகளை உணர்ந்து படைப்பிலக்கியவாதியாக மாறுதல்.
- ஊடகங்களில் பணிவாய்ப்பினைப் பெறுதல்.

பருவம்	பிரிவு	வகை	பாடக் குறியீடு	பாடத்தலைப்பு	முன் பாடக் குறியீடு	வாரம் மணி நேரம்	தரம்
							Min/ Max
I	I	தமிழ்	UTAL107 UTAL108	பொதுத்தமிழ் - I / சிறப்புத்தமிழ் - I	UTAL105/ UTAL106	5	3/4
	II	ஆங்கிலம்	UENL109/ UENL110	English for Communication (Stream-I)/ English for Communication (Stream-II)	UENL107/ UENL108	5	3/4
	III	முதன்மைப்பாடம் -I	UTAM102	நன்னூல்- எழுத்ததிகாரம்	-	6	4
		முதன்மைப்பாடம் -II	UTAM110	தமிழ் மொழி வரலாறு	-	6	5
		சார்புப்பாடம் -III	UTAA111	இக்கால இலக்கியங்கள்	-	6	4
		அலுவல்சார் ஆங்கிலம்	UPEM101	Professional English I	-	6	4
	IV	மதிப்பீட்டுக் கல்வி			-	2	1
				மொத்தம்		**36**	**24/26**
II	I	தமிழ்	UTAL207 UTAL208	பொதுத்தமிழ் -II/ சிறப்புத்தமிழ் -II	UTAL205/ UTAL 206	5	3/4
	II	ஆங்கிலம்	UENL209/ UENL210	English for Communication (Stream-I) / English for Communication (Stream-II)	UENL207/ UENL208	5	3/4
	III	முதன்மைப்பாடம் - IV	UTAM202	நன்னூல் - சொல்லதிகாரம்	-	6	5
		முதன்மைப்பாடம் -V	UTAM206	சிற்றிலக்கியங்கள்	-	5	4
		சார்புப்பாடம் -VI	UTAA207	தமிழ் இலக்கிய வரலாறு	-	6	4
		அலுவல்சார் ஆங்கிலம்	UPEM201	Professional English II	-	6	4
	IV	துறை சாரா விருப்பப்பாடம் - I	UTAE201	படைப்பிலக்கியம் - I	-	3	2
	V	கூடுதல் செயல்பாடு (Extension Activites)			-	-	2
				மொத்தம்		**36**	**27/30**
III	I	தமிழ்	UTAL307 UTAL308	பொதுத்தமிழ் -III / சிறப்புத்தமிழ் -III	UTAL 305/ UTAL306	5	3/4
	II	ஆங்கிலம்	UENL309 UENL310	English for Communication (Stream-I)/ English for Communication (Stream-II)	UENL 307/ UENL 308	5	3/4
	III	முதன்மைப்பாடம் -VII	UTAM303	யாப்பருங்கலக்காரிகை	-	4	5
		முதன்மைப்பாடம் -VIII	UTAM304	காப்பியங்கள்		4	4
		முதன்மைப்பாடம் -IX	UTAM306	கவிதை இலக்கியம்		4	4
		சார்புப்பாடம் -X	UTAA306	தமிழக வரலாறும் பண்பாடும்	UTAM106	6	4
		மதிப்பீட்டுக்கல்வி				2	1
				மொத்தம்		**30**	**24/26**

IV	I	தமிழ்	UTAL407 UTAL408	பொதுத்தமிழ் - IV/ சிறப்புத்தமிழ் -IV	UTAL405/ UTAL406	5	3/4
	II	ஆங்கிலம்	UENL409 UENL410	English for Communication (Stream-I) / English for Communication (Stream-II)	UENL407/ UENL 408	5	3/4
	III	முதன்மைப்பாடம் -XI	UTAM401	புறப்பொருள் வெண்பாமாலை	-	4	5
		முதன்மைப்பாடம் -XII	UTAM405	அற இலக்கியங்கள்	-	5	5
		சார்புப்பாடம் -XIII	UTAA404	நாட்டுப்புறவியல்	UTAM601	6	5
	IV	துறைசாரா விருப்பப்பாடம் -II	UTAE203	படைப்பிலக்கியம்- II	-	3	2
		Online course		Spoken Tutorial (NPTEL)		3	1/2
		திறன்சார்கல்வி			-	2	1
	V	கூடுதல் செயல்பாடு (Extension Activites)					2
				மொத்தம்		**30**	**25/30**
V	III	முதன்மைப்பாடம் - XIV	UTAM505	கவின் கலைகள்	-	6	5
		முதன்மைப்பாடம் -XV	UTAM506	சமய இலக்கியம்	-	6	5
		முதன்மைப்பாடம் -XVI	UTAM509	நம்பியகப்பொருள்	UTAM403	6	5
		முதன்மைப்பாடம் -XVII	UTAP501/ UTAM510	திட்டக்கட்டுரை / ஊடகத்தமிழ்	-	5	5/4
		துறைச்சார் விருப்பாடம் -XVIII	UTAO511 UTAO512 UTAO513	நாடகவியல் பெண்ணியம் சிந்தனையியல்	-	5	4
	IV	மதிப்பீட்டுக்கல்வி				2	1
				மொத்தம்		**30**	**24/25**
VI	III	முதன்மைப்பாடம் -XIX	UTAM603	இலக்கியத் திறனாய்வியல்	-	6	4
		முதன்மைப்பாடம் -XX	UTAM604	சொற்பொழிவுக்கலை	-	6	4
		முதன்மைப்பாடம் - XXI	UTAM607	தண்டியலங்காரம்	-	6	5
		முதன்மைப்பாடம் -XXII	UTAM609	சங்க இலக்கியம்	-	5	5
		துறைச்சார் விருப்பப்பாடம் - XXIII	UTAO610 UTAO611 UTAO612	புலம்பெயர்வு இலக்கியம் பெண்ணியப் படைப்புகள் விளம்பரவியல்	-	5	4
	III	புறவாய்மொழித்தேர்வு	UTAC606	மீள் ஆய்வு	-	-	1
	VI	திறன்சார்கல்வி			-	2	1
	V	கூடுதல் செயல்பாடு (Extension Activites)			-	-	2
				மொத்தம்		**30**	**24/26**
				கூட்டு எண்ணிக்கை		**192**	**148/163**

துறைசாரா விருப்பப் பாடம் (பிறதுறை மாணவியர்களுக்கு மட்டும்)

பருவம்	வகை	பாடக் குறியீடு	பாடத்தலைப்பு	முன் பாடக் குறியீடு	வாரம் மணி நேரம்	தரம் Min/ Max
II	துறைசாரா விருப்பப் பாடம் - II	UTAE202	படைப்பிலக்கியம் - I	-	3	2
IV	துறைசாரா விருப்பப் பாடம் - II	UTAE402	படைப்பிலக்கியம் - II	-	3	2

துறைச்சார் விருப்பப்பாடம்

பருவம்	வகை	பாடக் குறியீடு	பாடத்தலைப்பு	முன் பாடக் குறியீடு	வாரம் மணி நேரம்	தரம் Min/ Max
V	துறைச்சார் விருப்பாடம் -XVIII	UTAO511 UTAO512 UTAO513	நாடகவியல் பெண்ணியம் சிந்தனையியல்	-	5	4
VI	துறைச்சார் விருப்பப்பாடம் - XXIII	UTAO610 UTAO611 UTAO612	புலம்பெயர்வு இலக்கியம் பெண்ணியப் படைப்புகள் விளம்பரவியல்	-	5	4

கோடைக்காலப் பயிற்சி (விருப்பம் உள்ள மாணவியருக்குரியது)
(EXTRA CREDIT)

பருவம்	பிரிவு	வகை	பாடக் குறியீடு	பாடத்தலைப்பு	மணி நேரம்	தரம்	
						Min	Max
II	**III**	முதன்மைப்பாடம்	UTAI201	கோடைக்கால பயிற்சி வகுப்பு	ஒரு மாதம்	-	1
IV	**III**	முதன்மைப்பாடம்	UTAI401	கோடைக்கால பயிற்சி வகுப்பு	ஒரு மாதம்	-	1

தன்விருப்பப்பாடம் (விருப்பம் உள்ள மாணவியருக்குரியது)
(SELF STUDY PAPER)

பருவம்	பிரிவு	வகை	பாடக் குறியீடு	பாடத்தலைப்பு	வாரம் மணி நேரம்	தரம்	
						Min	Max
V	**III**	முதன்மைப்பாடம் - I	UTAS501	பதிப்பியல்	**26**	-	1
			UTAS502	கல்வெட்டியல்			
			UTAS503	தகவல் தொடர்பியல்			

நன்னூல் (எழுத்ததிகாரம்)

UTAM 102

பருவம் : முதல் பருவம் | **தரம் : 04**

பிரிவு : முதன்மைப்பாடம் - I | **மணிநேரம்/வாரம் : 06**

வகுப்பு : I B.A. தமிழ் | **மொத்த மணிநேரம் : 78**

கற்றலின் நோக்கம்

மாணவியர்,

- எழுத்துக்களின் தோற்றம் வளர்ச்சி குறித்து அறிதல்.
- எழுத்துக்கள் பிறக்கும் முறை குறித்து அறிதல்.
- எழுத்துகள் சொற்களாக அமையும் முறையினை அறிதல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- எழுத்துக்களின் வகைகள் குறித்து அறிந்து தெளிவர்.
- எழுத்து இலக்கணம் குறித்த சரியான புரிதலை அடைவர்.
- எழுத்துக்களை சொற்களாக சரியாக பயன்படுத்துவர்.

அலகு -1 **15 மணி நேரம்**

பாயிரவியல் - எழுத்தியல்.

அலகு -2 **20 மணி நேரம்**

பதவியல்

அலகு -3 **15 மணி நேரம்**

உயிரீற்றுப் புணரியல்.

அலகு -4 **15 மணி நேரம்**

மெய்யீற்றுப் புணரியல்.

அலகு -5 **13 மணி நேரம்**

உருபுப் புணரியல்.

பாடநூல்

- ஆறுமுக நாவலர் (உரை). (2002). *நன்னூல். எழுத்ததிகாரம்*. சைவ சித்தாந்த நூற்பதிப்புக் கழகம். சென்னை.

பார்வை நூல்கள்

- இராச, பாண்டியன். (2002). *நன்னூல் எழுத்ததிகாரம்.* சென்னை.
- கண்ணன்.கு. *நன்னூல் எழுத்ததிகாரம்.* (2006). பாவை பப்ளிகேஷன்ஸ். சென்னை.

தமிழ் மொழி வரலாறு
UTAM110

பருவம் : முதல் பருவம் **தரம்** : 05
பிரிவு : முதன்மைப்பாடம் - II **மணிநேரம் /வாரம்** : 06
வகுப்பு : I B.A. தமிழ் **மொத்த மணிநேரம்** : 78

கற்றலின் நோக்கம்

மாணவியர்,

- மொழியின் தோற்றம், வளர்ச்சி குறித்து அறிதல்.
- தமிழ் மொழி, எழுத்து இவற்றின் சிறப்பினை அறிதல்.
- மொழியின் வளர்ச்சி படிநிலையில் ஏற்படும் மாற்றங்கள் குறித்து அறிதல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- பிற மொழிக்கும் தமிழ் மொழிக்கும் உள்ள வேறுபாடு குறித்து அறிதல்.
- தமிழ்மொழி மாறியும் வளர்ந்தும் வந்துள்ள தன்மையை அறிவர்.
- எந்தவொரு மொழியிலும் மாற்றங்கள் தவிர்க்க இயலாதது என்பதை உணர்வர்.

அலகு - 1 **14 மணி நேரம்**

மொழியின் தோற்றம் - மொழியின் சிறப்பு - மொழியின் அமைப்பு - திராவிட மொழி இனங்கள்.

அலகு - 2 **20 மணி நேரம்**

தமிழ் மொழி எழுத்தின் தோற்றம் - எழுத்துகளின் வகைகள் - எழுத்தும் ஒலியும் - தமிழ் எழுத்துகள் - வட்டெழுத்துக்கள்.

அலகு - 3 **15 மணி நேரம்**

சோழர் காலத்தமிழ் - பல்லவர் காலத்தமிழ் - நாயக்கர் காலத்தமிழ் - பாண்டியர் காலத்தமிழ்.

அலகு - 4 **14 மணி நேரம்**

தமிழ் மொழியும் பிறமொழி கலப்பும் - கிளைமொழிகள் பொதுமொழி - திருந்திய மொழிகளும் திருந்தா மொழிகளும் - ஆரிய மொழி - திராவிட மொழி இடையேயான ஒற்றுமை.

அலகு - 5 **15 மணி நேரம்**

பழங்காலம் முதல் இக்காலம் வரை தமிழ் மொழியில் ஒலி, ஒளி வடிவ மாற்றங்கள்.

பாடநூல்கள்

- சக்திவேல், சு. (2002). *தமிழ் மொழி வரலாறு.* மணிவாசகர் பதிப்பகம். சென்னை.
- வரதராசன், மு. (2007). *தமிழ் மொழி வரலாறு.* பாரி நிலையம். பிராட்வே. சென்னை.

பார்வை நூல்கள்

- தெ.பொ.மீ. (2007). *தமிழ் மொழி வரலாறு.* கழக வெளியீடு. டி.டி.கே.சாலை. சென்னை.
- ஜெகதீசன், இரா.(2019).காலந்தோறும் மொழியாராச்சியும் மொழியமைப்பும், குறிஞ்சி பதிப்பகம். வேலூர்.

இக்கால இலக்கியங்கள்
UTAA111

பருவம் : முதல் பருவம் **தரம்** : 04
பிரிவு : சார்புப்பாடம் - III **மணிநேரம் / வாரம்** : 06
வகுப்பு : I B.A. தமிழ் **மொத்த மணிநேரம்** : 78

கற்றலின் நோக்கம்

மாணவியர்,

- தமிழ் மரபுக்கவிதை, புதுக்கவிதை முதலியானவற்றை அறிமுகப்படுத்துதல்.
- சிறுகதை, நாவல், கட்டுரை முதலான இலக்கிய வடிவங்களை கற்பித்தல்.
- இக்கால இலக்கியத்தின் மீதான ஈர்ப்பை மிகுவித்தல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- இக்கால இலக்கியத்தின் மீதான ஆர்வம் மிகும்.
- புதிய இலக்கிய வடிவங்களை அறிவர்.
- கவிதை, சிறுகதை ஆகியவற்றை படைக்க முயல்வர்.

அலகு - 1 கவிதை **14 மணி நேரம்**

பாரதியார் - கண்ணன்பாட்டு (தாய், தந்தை) பாரதிதாசன் - இருண்ட வீடு - பழமலை - குரோட்டன்களோடு கொஞ்ச நேரம் - முதல் ஐந்து கவிதைகள்.

அலகு - 2 நாடகம் **20 மணி நேரம்**

ஔவை - இன்குலாப்.

அலகு - 3 சிறுகதை **15 மணி நேரம்**

ரத்தினபாயின் ஆங்கிலம் - சுந்தரராமசாமி - கதவு - கி.ராஜநாராயணன் - அன்பளிப்பு கு.அழகிரிசாமி - புலி கலைஞன் - அசோகமித்திரன் - கொடிப்பாதை - கண்மணி குணசேகரன்.

அலகு - 4 நாவல் **14 மணி நேரம்**

ஒரு புளியமரத்தின் கதை - சுந்தர ராமசாமி.

அலகு - 5 கட்டுரை **15 மணி நேரம்**

தொ.பரமசிவம் - பரண்.

பாடநூல்கள்

- பாரதிதாசன். (2009). *இருண்ட வீடு*. குமரன் பதிப்பகம். சென்னை.
- பழமலை. (2010). *குரோட்டன்களோடு கொஞ்ச நேரம்*. தாமரைச் செல்வி பதிப்பகம். சென்னை.
- இன்குலாப். (2017). *ஔவை*. அன்னம் பதிப்பகம். தஞ்சாவூர்.

பார்வை நூல்கள்

- பரமசிவம், தொ. (2017). *பரண்*. சந்தியா பதிப்பகம். சென்னை.
- சுந்தர ராமசாமி. (2017). *ஒரு புளியமரத்தின் கதை*. காலச்சுவடு பதிப்பகம். நாகர்கோவில்.
- ராமகிருஸ்ணன், எஸ். (2019). *தமிழின் நூறு சிறந்த சிறுகதைகள்*. தேசாந்தரி பதிப்பகம் சென்னை.

நன்னூல் - சொல்லதிகாரம்
UTAM 202

பருவம் : இரண்டாம் பருவம் | **தரம் : 05**
பிரிவு : முதன்மைப்பாடம் -V | **மணிநேரம்/வாரம் : 06**
வகுப்பு : I B.A. தமிழ் | **மொத்த மணிநேரம் : 78**

கற்றலின் நோக்கம்

மாணவியர்,

- சொல் அமைப்பு, சொல் உருவாக்கம் குறித்து அறிந்து கொள்ளுதல்.
- சொற்பிழை நீக்கல், சொற்றொடர் அமைப்பின் விதிகளை தெரிந்து கொள்ளுதல்.
- சொற்கள் பிறக்கும் முறை அறிதல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- சொற்களின் வகைகளை அறிந்து தெளிவர்.
- சொல் இலக்கணம் குறித்த சரியான புரிதலை அடைவர்.
- சொற்களை சரியாக பயன்படுத்துவர்.

அலகு - 1 **16 மணி நேரம்**

பெயரியல்.

அலகு - 2 **16 மணி நேரம்**

வினையியல்.

அலகு - 3 **16 மணி நேரம்**

பொதுவியல் - I (நூற்பா 352 முதல் 384 வரை)

அலகு - 4 **15 மணி நேரம்**

பொதுவியல் - II (நூற்பா 385 முதல் 419 வரை)

அலகு - 5 **15 மணி நேரம்**

இடையியல், உரியியல்.

பாடநூல்

- ஆறுமுக நாவலர் உரை. (2002) *நன்னூல் சொல்லதிகாரம் (காண்டிகையுரை).* சைவ சித்தாந்த நூற்பதிப்புக்கழகம். சென்னை.

பார்வை நூல்கள்

- இளவரசு, சோம. (உரை). (2004). *நன்னூல் சொல்லதிகாரம். காண்டிகையுரை.* மணிவாசகர் பதிப்பகம். சென்னை.
- முகிலை ராசபாண்டியன் (உரை). (2008). *நன்னூல் சொல்லதிகாரம். காண்டிகையுரை.* மணிவாசகர் பதிப்பகம். சென்னை.
- ஸ்ரீசந்திரன், ஜெ. (உரை) (2007). நன்னூல் *காண்டிகையுரை.* வர்த்தமானன் பதிப்பகம். சென்னை.

சிற்றிலக்கியங்கள்
UTAM206

பருவம் : இரண்டாம் பருவம் | **தரம் : 04**
பிரிவு : முதன்மைப்பாடம் -V | **மணிநேரம்/வாரம் : 05**
வகுப்பு : I B.A. தமிழ் | **மொத்த மணிநேரம் : 65**

நோக்கம்:

மாணவியர்

- தமிழிலுள்ள சிற்றிலக்கியங்களைப் பற்றி அறிந்து கொள்ளல்.
- சிற்றிலக்கியங்களில் இடம்பெற்றுள்ள வாழ்வியல் நெறிகளை தெரிந்து கொள்ளல்.
- சிற்றிலக்கியங்களில் திறனாய்வுக் கோட்பாட்டை பொருத்திப் பார்த்தல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- சிற்றிலக்கியத்தின் வகை மற்றும் அமைப்புகளை அறிந்து தெளிவர்.
- சிற்றிலக்கியத்திற்குரிய தனித்தன்மைகளை அறிவர்.
- சிற்றிலக்கியத்தின் கூறுகளை உணர்வர்

அலகு- I பிள்ளைத் தமிழ், பரணி **15 மணி நேரம்**

தமிழ் இலக்கிய வகைமைகளில் சிற்றிலக்கிய வகை - சிற்றிலக்கியத்திற்கான பொது இலக்கண வரையறை - சிற்றிலக்கியச் சிறப்புகளும் தனித்தன்மைகளும் - முத்துக்குமாரசாமி பிள்ளைத் தமிழ் - வருகைப்பருவம் முதல் 5 பாடல்கள் மட்டும் - கலிங்கத்துப் பரணி - காளிக்குக் கூளி கூறியது கூழ் சமைத்தல் மட்டும்.

அலகு-II அந்தாதி, தூது, உலா **15 மணி நேரம்**

அந்தாதி - அபிராமி அந்தாதி முதல் 10 பாடல்கள் மட்டும் - தமிழ்விடு தூது - தமிழின் சிறப்புரைத்தல் 70 முதல் 100 வரை உள்ள கண்ணிகள் - மூவருலா - குலோத்துங்க சோழனுலா முதல் 10 பாடல்கள் மட்டும்.

அலகு- III கலம்பகம், சதகம், குறவஞ்சி **10 மணி நேரம்**

நந்திக்கலம்பகம் - கொடைச்சிறப்பு முதல் 10 பாடல்கள் மட்டும் - நீதி சதகம் அறப்பளீசுர சதகம் முதல் 5 பாடல்கள் மட்டும் - குற்றாலக்குறவஞ்சி - மலை வளம் கூறுதல் முதல் 10 பாடல்கள் மட்டும்.

அலகு- IV பள்ளு, மடல், கோவை **10 மணி நேரம்**

முக்கூடற்பள்ளு - பயிர்த் தொழில் மட்டும் - திருக்கோவையார் முதல் 5 பாடல்கள் மட்டும் - சிறிய திருமடல் - முதல் 5 பாடல்கள் மட்டும்.

அலகு- V நான்மணிமாலை, பள்ளியெழுச்சி பதிகம் **10 மணி நேரம்**

நால்வர் நான்மணிமாலை - முதல் 10 பாடல்கள் மட்டும் - திருப்பள்ளி எழுச்சி - பெரியாழ்வார் முதல் 5 பாடல்கள் மட்டும் பதிகம் - கண்ணிநுண் சிறுத்தாம்பு - மதுரகவியாழ்வார் முதல் 5 பாடல்கள் மட்டும்.

பாடநூல்கள்

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- இராதாகிருஷ்ணன், செ. (ப.ஆ). (2010). *தமிழ்விடு தூது.* முல்லை நிலையம். சென்னை.
- புலியூர்க்கேசிகன் (ப.ஆ). (2000). *குற்றாலக்குறவஞ்சி.* பாரி நிலையம். சென்னை.
- இராதாகிருஷ்ணன், செ. (ப.ஆ). (2010) *நந்திக்கலம்பகம்.* முல்லை நிலையம். சென்னை.

பார்வை நூல்கள்

- செயராமன், ந.வீ. (2010) *சிற்றிலக்கியச் செல்வம்.* மணிவாசகர் பதிப்பகம். சிதம்பரம்.
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- முத்துராசன். கு. (2005). *சிற்றிலக்கியச் சிந்தனைகள்.* தேன் தமிழ் பதிப்பகம். சேலம்.
- *பிள்ளைத் தமிழ் இலக்கியங்கள்.* (2007). மணிவாசகர் பதிப்பகம். சிதம்பரம்.
- *முக்கூடற்பள்ளு.* (2007). வானதி பதிப்பகம். பாரி நிலையம். சென்னை.

தமிழ் இலக்கிய வரலாறு
UTAA207

பருவம்	:	இரண்டாம் பருவம்	**தரம்**	:	04
பிரிவு	:	சார்புப்பாடம் VII	**மணிநேரம் / வாரம்**	:	06
வகுப்பு	:	I B.A.தமிழ்	**மொத்த மணிநேரம்**	:	78

கற்றலின் நோக்கம்

மாணவியர்,

- தமிழ் இலக்கிய வரலாற்றை கற்பித்தல்.
- தமிழ் இலக்கிய நூல்களின் தோற்றம், வளர்ச்சி ஆகியனவற்றை அறிதல்.
- தமிழ் இலக்கியங்கள் வடிவ உள்ளடக்க மாற்றங்களை தெளிவுப்படுத்துதல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- தமிழ் இலக்கியங்கள் காலந்தோறும் தோன்றி வளர்ந்த வரலாற்றை அறிவர்.
- இலக்கியங்களுக்கும் அரசியல் வரலாற்றுக்கும் இடையே உள்ள உறவை அறிவர்.
- இலக்கிய நூல்களின் தோற்றக் காரணிகளை அறிந்து தெளிவர்.

அலகு - 1 சங்க இலக்கியம் 14 மணி நேரம்

சங்கம் விளக்கம் - முதல்சங்கம், இடைசங்கம், கடைச்சங்கம் - தோற்றம் வளர்ச்சி - சங்கம் பற்றிய செய்திகள் - சங்கம் பற்றிய அறிஞர்கள் கருத்து - சங்க இலக்கியங்கள் - எட்டுத்தொகையும் பத்துப்பாட்டு - திணைக்கோட்பாடு - அகத்திணைகள் ஐந்திணைக்குரிய முதற்பொருள்கள் - உரிப்பொருள்கள் - கருப்பொருள்கள்.

அலகு - 2 சங்கம் மருவிய கால இலக்கியம் 20 மணி நேரம்

இரட்டைக் காப்பியங்கள் - சிலப்பதிகாரம், மணிமேகலை - பதினெண்கீழ்கணக்கு நூல்கள். நீதிநூல்கள் - அகப்பொருள் நூல்கள் - புறப்பொருள் நூல்கள்.

அலகு - 3 காப்பியம் 15 மணி நேரம்

ஐம்பெருங்காப்பியங்கள் - சிலப்பதிகாரம் - மணிமேகலை - சீவகசிந்தாமணி - வளையாபதி - குண்டலகேசி - ஐஞ்சிறுக்காப்பியங்கள் - சூளாமணி - யசோதர காவியம் - உதயகுமார காவியம் - நீலகேசி - நாககுமார காவியம் - பிற காப்பியங்கள் - பெரியபுராணம் - தேம்பாவணி - கம்பராமாயணம்.

அலகு - 4 சிற்றிலக்கியம் 14 மணி நேரம்

சிற்றிலக்கியங்கள் விளக்கம் - பிள்ளைத்தமிழ் - கலம்பகம் - உலா - தூது - அந்தாதி - பரணி - குறவஞ்சி - பள்ளு - சதகம் - கோவை

அலகு - 5 தற்கால இலக்கியம் 15 மணி நேரம்

மரபுக்கவிதை - புதுக்கவிதை - உரைநடை - சிறுகதை - புதினம் - நாடகம்.

பாடநூல்கள்

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- ஜெயம், அ. (2010). *தமிழ் இலக்கிய வரலாறு.* ஜனகா பதிப்பகம். சென்னை.

பார்வை நூல்கள்.

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- இராசா, கி. (2011). *தமிழ் இலக்கிய வரலாறு.* நியூ செஞ்சரி புக் ஹவுஸ். சென்னை.

படைப்பிலக்கியம் - I
UTAE203

பருவம் : இரண்டாம் பருவம் **தரம்** : 02
பிரிவு : துறைசாரா விருப்பப்பாடம் **மணிநேரம் /வாரம்** : 03
வகுப்பு : I B.A. தமிழ் **மொத்த மணிநேரம்** : 39

கற்றலின் நோக்கம்

மாணவியர்,

- படைப்பிலக்கியத்தின் பல்வேறு கூறுகளைக் கற்பித்தல்.
- படைப்பிலக்கிய மொழியின் தனித்தன்மைகளை அறிவுறுத்தல்.
- கவிதை, நாடகம், உரைநடை, சிறுகதை ஆகியவற்றின் தனித்தன்மைகளைக் கற்றுத்தருதல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- இலக்கியப் படைப்பாக்கத் திறன் பெறுவர்.
- இதழாசிரியராவதற்கான தகுதிப்பாட்டை அடைவர்.
- உரைநடை வகைகளை படைப்பதில் திறம் பெறுவர்.

அலகு - 1 சிறுகதை **8 மணி நேரம்**

சிறுகதை எழுதுதல் - சிறுகதையின் இலக்கணத்தை மீறாது கொடுக்கப்படும் சமுதாயம் சிக்கலை அடிப்படையாகக் கொண்டு ஐந்து பக்கங்களுக்கு மிகாமல் சிறுகதை எழுதப் பயிற்றுவித்தல்.

அலகு - 2 மரபுக்கவிதை **8 மணி நேரம்**

மரபுக்கவிதை எழுதுதல் - யாப்பினை அடிப்படையாகக் கொண்டு மரபுக்கவிதை எழுதப் பயிற்றுவித்தல்.

அலகு - 3 புதுக்கவிதை **8 மணி நேரம்**

புதுக்கவிதை எழுதுதல் - மையக் கருத்தை அடிப்படையாகக் கொண்டு 20 அடிகளுக்கு மிகாமல் புதுக்கவிதை எழுதப் பயிற்றுவித்தல்.

அலகு - 4 நாடகம் **8 மணி நேரம்**

வானொலி அல்லது தொலைக்காட்சிக்கு ஏற்ப வழங்கப்படும் சூழலைச் சிந்தனையில் கொண்டு ஐந்து காட்சிகளுக்கு மிகாமல் ஓரங்க நாடகம் எழுதக் கற்றுத் தருதல்

அலகு - 5 உரைநடை **7 மணி நேரம்**

உரைநடை எழுதுதல் - அறிவியல் - உளவியல் - சமுகவியல் - கல்வியியல் - பொருளியியல் தகவல்களை மனதில் கொண்டு கொடுக்கப்படும் தலைப்பை ஒட்டி ஐந்து பக்கங்களுக்கு மிகாமல் எழுதுதல் பயிற்சி.

பாடநூல்கள்

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பார்வை நூல்கள்

- அப்துல்ரகுமான். (2005). *ஆலாபனை.* நேஷனல் பப்ளிகேஷன்ஸ். சென்னை.
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பொதுத்தமிழ் - I
UTAL107

பருவம் : முதல் பருவம்
பிரிவு : பொதுத்தமிழ்
வகுப்பு : I UG

தரம் : 03
மணிநேரம் / வாரம் : 05
மொத்த மணி நேரங்கள் : 65

கற்றலின் நோக்கம்

மாணவியர்,

- இலக்கிய உலகில் தடம் பதித்த தற்காலக் கவிஞர்களை அறிதல்.
- கவிதை இலக்கிய வரலாற்றினை தெரிந்து கொள்ளுதல்.
- நடைமுறை இலக்கணத்தை எளிய முறையில் அறிந்து கொள்ளுதல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- எழுத்துகளின் அறிமுகம் பற்றி அறிந்து கொள்வர்.
- கவிதை எழுதுதல் பற்றி அறிந்து கொள்வர்.
- தமிழ் இலக்கிய நூல்களின் தோற்றம் பற்றி அறிந்து கொள்வர்.

அலகு - 1 மரபுக்கவிதை **15 மணி நேரம்**

பாரதியார் கவிதைகள் - குயில் பாட்டு (முழுவதும்) - பாரதிதாசன் - கவிதைத்தொகுப்பு - சஞ்சீவி பர்வதத்தின் சாரல் - வாணிதாசன் கவிதை - சிரித்த நுணா முதல் 5 கவிதைகள் - கண்ணதாசன் - ஏழாம் தொகுதி (மானிடமும் ஈஸ்வரமும், யார்நால்வர், வேண்டும் வேண்டும்) 3 கவிதைகள்.

அலகு - 2 புதுக்கவிதை **15 மணி நேரம்**

சென்னிமலை கிளியோபாத்ராக்கள் - ஈரோடு தமிழன்பன் - ஒரு கிராமத்து நதி (முதல் 5 கவிதை) - சிற்பி பாலசுப்ரமணியம் - ஆகாயத்தில் அடுத்தவீடு (முதல் 5 கவிதைகள்) மு.மேத்தா - நிரந்தர மனிதர்கள் - அறிவுமதி (கவிஞர்கள், தீ குளித்த வீட்டில், பிணம் சுமக்கும் எறும்புகளே).

அலகு - 3 தமிழ் இலக்கிய வரலாறு **15 மணி நேரம்**

தற்கால இலக்கிய வரலாறு (கவிதை - உரைநடை - சிறுகதை - புதினம் - நாடகம்).

அலகு - 4 உரைநடை **10 மணி நேரம்**

சுந்தரராமசாமி - காற்றில் கலந்த பேரோசை, மறைமலையடிகள் - தனித்தமிழ் இயக்கம், மு.வரதராசனார் - எளிமை ஒரு அறம், பாமா - நேர்காணல்.

அலகு - 5 இலக்கணம் **10 மணி நேரம்**

எழுத்துக்களின் அறிமுகம் - முதல் எழுத்து - சார்பு எழுத்துக்கள் - மொழி முதல், இறுதி எழுத்துக்கள்.

பாடநூல்கள்

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- பரமசிவம், சோ. (2008). *நற்றமிழ் இலக்கணம்.* பட்டு பதிப்பகம். சென்னை.
- ஜெயம், அ. (2008). *இலக்கிய வரலாறு.* ஜனகா பதிப்பகம். சென்னை.

பார்வை நூல்கள்

- மறைமலையடிகள்.(2000). *இந்திய இலக்கியச் சிற்பிகள்.* சாகித்திய அகாதெமி வெளியீடு.
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- கண்ணதாசன். (2008). *கண்ணதாசன் கவிதைகள்.* கண்ணதாசன் பதிப்பகம். சென்னை.
- அறிவுமதி கவிதைகள். (2007). *நிரந்தர மனிதர்கள்.* நியு செஞ்சுரி புக் ஹவுஸ். சென்னை.

சிறப்புத்தமிழ் - I
UTAL108

பருவம் : முதல் பருவம் **தரம்** : 04
பிரிவு : சிறப்புத்தமிழ் **மணிநேரம்** : 05
வகுப்பு : I UG **மொத்த மணிநேரம்** : 65

கற்றலின் நோக்கம்

மாணவியர்,

- கவிதை இலக்கியத்தை பற்றி அறிந்து கொள்ளுதல்.
- உரைநடை இலக்கியத்தின் போக்குகளை அறிதல்.
- நடைமுறை இலக்கணத்தை எளிய முறையில் அறிந்து கொள்ளுதல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- கவிதை இலக்கியம் குறித்த தெளிவினை அடைவர்.
- உரைநடை இலக்கியத்தின் முழுத்திறனை அறிவர்.
- படைப்பிலக்கியத்தில் ஆளுமைத்திறன் பெறுவர்.

அலகு - 1 கவிதை **15 மணி நேரம்**

பாரதியார் சுயசரிதை - கனவுப்பகுதி (முழுவதும்) - பாரதிதாசன் - அழகின் சிரிப்பு (முழுவதும்) - வாணிதாசன் - கொடிமுல்லை (முதல் 10 பாடல்கள்) - அப்துல் ரகுமான் - ஆலாபனை - ஒப்புதல் வாக்குமூலம் - வைரமுத்து - மரங்களைப் பாடுவேன் - பூரணி - பூரணி கவிதைகள் (முதல் ஐந்து கவிதைகள்) - சிற்பி - சர்ப யாகம் (முதல் இரண்டு கவிதைகள்).

அலகு - 2 இலக்கிய வரலாறு **15 மணி நேரம்**

தற்கால இலக்கியம் - கவிதை - உரைநடை - சிறுகதை - புதினம் - நாடகம்.

அலகு - 3 உரைநடை **10 மணி நேரம்**

ரா.பி.சேதுப்பிள்ளை - கலையும் கற்பனையும் - இரசிகமணி - கம்பரும் நீதிநெறியும் - உ.வே.சா. - உதிர்ந்த மலர்கள் - கி.வா.ஜகந்நாதன் - அறிவிற்பெரியவன் - ரா.பி.சேதுப்பிள்ளை - காளத்தி வேடனும் கங்கை வேடனும்.

அலகு - 4 இலக்கணம் **10 மணி நேரம்**

முதலெழுத்து - சார்பெழுத்து - மொழி முதல் எழுத்து - மொழி இறுதி எழுத்து - மெய்மயக்கம் - புணர்ச்சி - இலக்கண அடிப்படைகள்.

அலகு - 5 படைப்பும் திறனாய்வும் **15 மணி நேரம்**

கட்டுரை - கவிதைப் படைத்தல் - கட்டுரை - கவிதைத் திறனாய்வு.

பாடநூல்கள்

- பாரதியார். (2005). *பாரதியார் கவிதைத் தொகுப்பு.* மணிவாசகர் பதிப்பகம். சென்னை.
- பாரதிதாசன். (2005). *பாரதிதாசன் கவிதைத் தொகுப்பு.* மணிவாசகர் பதிப்பகம். சென்னை.
- அப்துல் ரகுமான்.(2008).*அப்துல் ரகுமான் கவிதைத்தொகுப்பு.*கோலம் வெளியீடு. சென்னை.
- வாணிதாசன். (2005). *கொடிமுல்லை.* மணிவாசகர் பதிப்பகம். சென்னை.
- *இந்திய இலக்கியச் சிற்பிகள்.* (2005). சாகித்ய அகாதமி வெளியீடு. சென்னை.
- ஜெயம், அ. (2010). *இலக்கிய வரலாறு.* ஜனகா பதிப்பகம். சென்னை.
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பார்வை நூல்கள்

- தட்சணாமூர்த்தி, வை. (2008). *எளிய தமிழ் இலக்கணம்.* திருவரசு புத்தக நிலையம். சென்னை.
- சேதுப்பிள்ளை, ரா.பி. (2004). *தமிழின்பம்.* (தொகு) பழனியப்பா பிரதர்ஸ். சென்னை.

பொதுத்தமிழ் -II

UTAL207

பருவம் : இரண்டாம் பருவம் **தரம்** : 03
பிரிவு : பொதுத்தமிழ் - II **மணிநேரம் /வாரம்** : 05
வகுப்பு : I UG (Basic Level) **மொத்த மணி நேரங்கள்** : 65

கற்றலின் நோக்கம்

மாணவியர்,

- ஆன்மீக ஈடுபாட்டினையும், படைப்பாற்றலையும் வளர்த்துக் கொள்ளுதல்.
- எளிய முறையில் இலக்கண அறிவைப் பெறுதல்.
- தமிழ் இலக்கியங்களின் வாயிலாக சமூகத்தை மேம்படுத்துதல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- தமிழ் இலக்கியத்தின் மீதான ஆர்வம் மிகும்.
- புதிய இலக்கியத்தின் வடிவங்களை அறிவர்.
- கவிதை, சிறுகதை ஆகியவற்றை படைக்க முயல்வர்.

அலகு - 1 சைவ இலக்கியம் **15 மணி நேரம்**

திருஞானசம்பந்தர் - மந்திரமாவது நீறு - என தொடங்கும் முதல் 5 பாடல்கள் (இரண்டாம் திருமுறை, திருநீற்றுப்பதிகம்) - திருநாவுக்கரசர் - கூற்றாயினவாறு - என தொடங்கும் முதல் 5 பாடல்கள் (நான்காம் திருமுறை) - சுந்தரர் - பித்தா பிறைசூடி - என தொடங்கும் முதல் 5 பாடல்கள் - மாணிக்கவாசகர் - திருச்சதகம் (திருக்கோத்தும்பி - முதல் 5பாடல்கள்). திருமந்திரம் - 5பாடல்கள் (6,95,143,160,182)

அலகு - 2 வைணவ இலக்கியம் **11 மணி நேரம்**

பெரியாழ்வார் - திருத்தாலாட்டு - முதல் 10 பாடல்கள் - ஆண்டாள் - திருப்பாவை முதல் 10 பாடல்கள்.

அலகு - 3 தமிழ் இலக்கிய வரலாறு **12 மணி நேரம்**

நாயன்மார்கள் - ஆழ்வார்கள் - இலக்கிய வரலாறு.

அலகு - 4 சிறுகதை **15 மணி நேரம்**

அம்பை - காட்டில் ஒரு மான் - ஜெயகாந்தன் - யுகசந்தி - சுந்தரராமசாமி - கிடாரி - புதுமைப்பித்தன் - சாபவிமோசனம்.

அலகு - 5 இலக்கணம் **12 மணி நேரம்**

பெயரெச்சம் - வினையெச்சம் - மூவிடம் - ஐம்பால் - ஈரெண் - ஆகுபெயர்.

பாடநூல்கள்

- சுந்தரர். (2008). *ஏழாம் திருமுறை.* மணிவாசகர் பதிப்பகம். சென்னை.
- ஜெயம், அ. (2008). *இலக்கிய வரலாறு.* ஜனகா பதிப்பகம். சென்னை.
- மறைமலையடிகள். (2000). *இந்திய இலக்கிய சிற்பிகள்.* சாகித்திய அகாதெமி வெளியீடு. சென்னை.
- சுப்ரமணியர், சா.வே. (2009). *திருஞானசம்பந்தர் நான்காம் திருமுறை.* மணிவாசகர் பதிப்பகம். சென்னை.
- அம்பை. (2003). *காட்டில் ஒரு மான்.* காலச்சுவடு பதிப்பகம். சென்னை.
- சுந்தரராமசாமி. (2004). *சிறுகதைத் தொகுப்பு.* காலச்சுவடு பதிப்பகம். சென்னை.

பார்வை நூல்கள்

- பெரியாழ்வார். (2005). *திருத்தாலாட்டு.* திருவேங்கடத்தான் திருமன்றம். சென்னை.
- திருமூலர். (2008). *திருமந்திரம்.* நர்மதா பதிப்பகம். சென்னை.
- புதுமைப்பித்தன். (2003). *புதுமைப்பித்தன் படைப்புலகம்.* கலைஞன் பதிப்பகம். சென்னை.

சிறப்புத்தமிழ் - II
UTAL208

பருவம் : இரண்டாம் பருவம் **தரம்** : 04
பிரிவு : சிறப்புத்தமிழ் - II **மணிநேரம்** : 05
வகுப்பு : I UG (Advanced Level) **மொத்த மணிநேரம்** : 65

கற்றலின் நோக்கம்

மாணவியர்,

- ஆன்மீக ஈடுபாட்டினையும், படைப்பாற்றலையும் வளர்த்து கொள்ளுதல்.
- இலக்கண, இலக்கிய அறிவைப் பெறுதல்.
- படைப்பாற்றல் வளர்ச்சி பெறுதல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- இலக்கியத்தின் பெருமை குறித்து அறிதல்.
- கவிதை உரைநடை படைப்புகள் பற்றி அறிந்து கொள்வர்.
- திறனாய்வு முறை குறித்து அறிதல்.

அலகு -1 சமய இலக்கியம் **15 மணி நேரம்**

தேவாரம் - திருஞானசம்பந்தர் - தோடுடைய செவியன் (முதல் திருமுறை - 5 பாடல்) திருவாசகம் - பிடித்த பத்து "அம்மையே அப்பா ... எனத் தொடங்கும் 536 முதல் 540 பாடல்கள் வரை (மாணிக்கவாசகர் - எட்டாம் திருமுறை) திருப்பாவை - முழுவதும்.

அலகு -2 இலக்கிய வரலாறு **11 மணி நேரம்**

சமய இலக்கிய வரலாறு - சைவம் - வைணவம் - சமணம் - பௌத்தம் - இஸ்லாமியம் - கிறித்துவம்.

அகு -3 சிறுகதை **12 மணி நேரம்**

ஒரு நாள் கழிந்தது - புதுமைப்பித்தன் - தக்கையின் மீது நான்கு கண்கள் - சா.கந்தசாமி - ராஜா வந்திருக்கிறார் - அழகிரிசாமி - தனிமைத்தளிர் - ஆர்.சூடாமணி - இருளப்பசாமியும் 21 கிடாயும் - வேல் ராமமூர்த்தி.

அலகு - 4 இலக்கணம் **15 மணி நேரம்**

வழு - வழுவமைதி - தொடர் வகைகள் - தொகைநிலை - தொகாநிலை.

அலகு - 5 படைப்பும் திறனாய்வும் **12 மணி நேரம்**

சிறுகதை படைத்தல் - சிறுகதைத் திறனாய்வு (அமைப்பு, உத்தி).

பாடநூல்கள்

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பாடத்திட்ட அமைப்பு

அகமதிப்பீட்டிற்கான III ஆம் மற்றும் IV ஆம் உட்கூறுகள்

இளங்கலைத்தமிழ்

பருவம்	வகை	பாடக் குறியீடு	பாடத்தலைப்பு	III உட்கூறுகள்	IV உட்கூறுகள்
I	தமிழ்	UTAL107	பொதுத்தமிழ் - I	ஓப்படைப்பு	நூல் பட்டியல் தயாரித்தல்
	தமிழ்	UTAL108	சிறப்புத்தமிழ் - I	ஓப்படைப்பு	கருத்தரங்கம்
	முதன்மைப்பாடம் -I	UTAM102	நன்னூல்- எழுத்ததிகாரம்	ஓப்படைப்பு	இலக்கிய ஒப்பீடு
	முதன்மைப்பாடம் -II	UTAM110	தமிழ் மொழி வரலாறு	ஓப்படைப்பு	நூல் பட்டியல் தயாரித்தல்
	சார்புப்பாடம் -III	UTAA111	இக்கால இலக்கியங்கள்	ஓப்படைப்பு	கவிதை/ சிறுகதை எழுதுதல்
II	தமிழ்	UTAL207	பொதுத்தமிழ் - II	ஓப்படைப்பு	இலக்கணக் குறிப்பினைக் கண்டறிதல்
	தமிழ்	UTAL208	சிறப்புத்தமிழ் - II	ஓப்படைப்பு	கருத்தரங்கம்
	முதன்மைப்பாடம் - IV	UTAM202	நன்னூல் - சொல்லதிகாரம்	ஓப்படைப்பு	இலக்கண ஒப்பீடு
	முதன்மைப்பாடம் -V	UTAM206	சிற்றிலக்கியங்கள்	ஓப்படைப்பு	கருத்தரங்கம்
	சார்புப்பாடம் -VI	UTAA207	தமிழ் இலக்கிய வரலாறு	ஓப்படைப்பு	நூல் மதிப்பீடு
	துறை சாரா விருப்பப்பாடம்-I	UTAE201	படைப்பிலக்கியம் - I	ஓப்படைப்பு	கவிதை/ சிறுகதை எழுதுதல

முதுகலைத்தமிழ்

முகவுரை

நான்கு பருவங்களுக்குரிய பாடத்திட்ட வடிவமைப்பு இடம் பெற்றுள்ளது. **முதல் மற்றும் இரண்டாம்** பருவத்திற்கு உரிய பாடத்திட்டங்கள் மற்றும் அகமதிப்பீட்டுக் கூறுகள் இடம் பெற்றுள்ளன. **இப்பாடத்திட்டமானது 2021 - 2023 ஆம் கல்வியாண்டுகளில் பயிலும் முதுகலை மாணவியர்களுக்கு உரியது.**

பாடத்திட்ட அமைப்பு : முதுகலைத்தமிழ் (M.A)

பாடத்திட்டப் பயன்கள்

- தமிழ் இலக்கியங்களின் வாயிலாக சமூகத்தை மேம்படுத்துதல்.
- தமிழ் மொழியின் இயல்புகள் உணர்ந்து மொழியியலாளராக தம்மை உருவாக்கிக்கொள்ளுதல்.
- படைப்பிலக்கியங்களின் தன்மைகளை உணர்ந்து படைப்பிலக்கியவாதியாக மாறுதல்.
- ஊடகங்களில் பணிவாய்ப்பினைப் பெறுதல்.

பருவம்	வகை	பாடக் குறியீடு	பாடத்தலைப்பு	முன் பாடக் குறியீடு	வாரம் மணி நேரம்	தரம் Min/ Max
I	முதன்மைப்பாடம் - I	PTAM102	தொல்காப்பியம் - எழுத்ததிகாரம்	-	6	5
	முதன்மைப்பாடம் - II	PTAM104	தொல்லியல்	-	6	5
	முதன்மைப்பாடம் - III	PTAM107	ஒப்பிலக்கியம்	-	6	4
	முதன்மைப்பாடம் - IV	PTAM108	தமிழ் இலக்கிய சூழலில் பெண்ணியம்	-	5	4
	முதன்மைப்பாடம் - V	PTAM111	நவீன இலக்கியம்	PTAM110	6	5
		நூலகம்			1	-
			மொத்தம்		**30**	**23**
II	முதன்மைப்பாடம் - VI	PTAM203	தொல்காப்பியம் - சொல்லதிகாரம்	-	5	4
	முதன்மைப்பாடம் - VII	PTAM209	திறனாய்வுக்கோட்பாடுகள்	-	5	4
	முதன்மைப்பாடம் - VIII	PTAM210	அற இலக்கியங்கள்	-	4	3
	முதன்மைப்பாடம் - IX	PTAM211	அகராதியியல்	-	5	3
	முதன்மைப்பாடம் - X	PTAM213	காப்பியங்கள்	PTAM112	5	4
	துறைசாரா விருப்பப் பாடம் - II	PTAE202	சுற்றுலாவியல்	-	5	4
	ONLINE COURSE	PONL201	SPOKEN TUTORIAL / NPTEL	-	-	-/2
	SERVICE LEARNING	PTAX202	பயன்பாட்டுத்தமிழ்	-	-	1
		நூலகம்			1	-
			மொத்தம்		**30**	**23/25**
III	முதன்மைப்பாடம் - XI	PTAM301	தொல்காப்பியம் - பொருளதிகாரம் - I	-	6	5
	முதன்மைப்பாடம் - XII	PTAM305	ஆராய்ச்சி நெறிமுறைகள்	-	6	4
	முதன்மைப்பாடம் - XIII	PTAM306	உரையாசிரியர்கள்	-	6	4
	முதன்மைப்பாடம் - XIV	PTAM310	சிற்றிலக்கியங்கள்	PTAM309	5	4
	பல்துறை சார்பு பாடம் -I	PTAI301	மொழி பெயர்ப்பியல்	-	5	4
	திட்டக்கட்டுரை	PTAP301	ஆய்வு திட்டக்கட்டுரை	-	2	-
		நூலகம்			1	-
			மொத்தம்		**30**	**21**
IV	முதன்மைப்பாடம் - XV	PTAM401	தொல்காப்பியம்-பொருளதிகாரம் - II	-	6	5
	முதன்மைப்பாடம் -	PTAM410	ஊடகவியல்	PTAM404	6	5
	முதன்மைப்பாடம் - XVII	PTAM406	தமிழ்க்கணினி பயன்பாட்டியல்	-	6	4
	முதன்மைப்பாடம் -XVIII	PTAM411	சங்க இலக்கியம்	PTAM409	6	5
	திட்டக்கட்டுரை	PTAP401	ஆய்வு திட்டக்கட்டுரை	-	4	4
		நூலகம்			2	-
			மொத்தம்		**30**	**23**
			கூட்டு எண்ணிக்கை		**120**	**90/92**

தொல்காப்பியம் - எழுத்ததிகாரம்
PTAM102

பருவம் : முதல் பருவம் | **தரம் : 05**
பிரிவு : முதன்மைப்பாடம் - I | **மணிநேரம் வாரம் : 06**
வகுப்பு : M.A. தமிழ் | **மொத்த மணிநேரம் : 78**

கற்றலின் நோக்கம்

மாணவியர்,

- இலக்கணப் பிழையின்றி எழுதத் தெரிந்து கொள்ளுதல்.
- எழுத்துகளின் பிறப்பு பற்றி அறிந்துகொள்ளுதல்.
- எழுத்துகளின் வகைமைப் பற்றி கற்றுத்தருதல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- தமிழ் இலக்கணத்தின் தொடர் அமைப்புகள் பற்றி அறிவர்.
- எழுத்து இலக்கணம் குறித்து அறிந்து தெளிவர்.
- தொடர் அமைப்புகள் குறித்து தெளிந்து வாக்கியங்களை கட்டமைத்தல்.

அலகு - 1 **15 மணி நேரம்**

நூன் மரபு - மொழி மரபு

அலகு - 2 **16 மணி நேரம்**

பிறப்பியல் - தொகை மரபு

அலகு - 3 **16 மணி நேரம்**

புணரியல் - உருபியல்

அலகு - 4 **16 மணி நேரம்**

உயிர் மயங்கியல் - புள்ளி மயங்கியல்

அலகு - 5 **15 மணி நேரம்**

குற்றியலுகரப் புணரியல்

பாடநூல்

- தொல்காப்பியம் எழுத்ததிகாரம். (2003). (இளம்பூரணர் உரை). தமிழ் மண் பதிப்பகம். சென்னை.

பார்வை நூல்கள்

- அகத்தியலிங்கம், ச. (2008). *தொல்காப்பிய மொழியியல்.* அண்ணாமலைப் பல்கலைக்கழகம். சிதம்பரம்.
- சுந்தரமூர்த்தி, கு. (2005). *தொல்காப்பியம் எழுத்ததிகாரம்.* அண்ணாமலைப் பல்கலைக்கழகம். சிதம்பரம்.
- சுப்ரமணியன், ச.வே. (2002). *இலக்கணத்தொகை.* பாரிநிலையம். சென்னை.
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தொல்லியல்
PTAM104

பருவம் : முதல் பருவம் | **தரம் : 05**
பிரிவு : முதன்மைப்பாடம் - II | **மணிநேரம் /வாரம் : 06**
வகுப்பு : I M.A. தமிழ் | **மொத்த மணிநேரம் : 78**

கற்றலின் நோக்கம்

மாணவியர்,

- தமிழின் தொன்மை குறித்து தெரிந்து கொள்ளுதல்.
- தமிழரின் நாகரீகம் பற்றி அறிந்துகொள்ளுதல்.
- வரிவடிவம் அமைப்புகள் குறித்து அறிதல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- அகழாய்வு பற்றி அறிவர்.
- எழுத்துவடிவம் பற்றி அறிந்து தெளிவர்.
- தமிழரின் பழமை பற்றி உணர்தல்.

அலகு - 1 தொல்லியல் அறிமுகம் **16 மணி நேரம்**

பொருள் விளக்கம் - வரலாற்றுச் சான்றுகள் - வகைகள் - நோக்கம் பிற இயல்களுக்கிடையேயான தொடர்பு- தமிழ் நாட்டின் அகழாய்விடங்கள்.

அலகு - 2 தொல்லியலார் **16 மணி நேரம்**

பணிகள் - சுற்றாய்வு - அகழாய்வும் - அதன் வகைகளும் - கால வரையறை செய்தல்- பொருட்களைப் பாதுகாத்தல்.

அலகு - 3 வரலாற்றுக்கு முற்பட்டக் காலம் **16 மணி நேரம்**

மண்ணியல் காலமும் பனிப்படர்வு காலமும் - கற்காலம் - உலோகக்காலம் - மட்கலப் பண்பாடு - இந்திய தொல்லியல் துறை.

அலகு - 4 கல்வெட்டு இயல் **15 மணி நேரம்**

கல்வெட்டு இயலின் பொருளும் முக்கியத்துவமும் - வகைகள் - தொல் எழுத்தியல் - தமிழ் எழுத்து - வட்டெழுத்து - கிரந்த எழுத்து - கல்வெட்டுக்களின் கால நிர்ணயம்.

அலகு - 5 நாணயவியல் **15 மணி நேரம்**

நாணயவியல் - மௌரியர் - குசானர் - சாளுக்கியர் - பாண்டியர்- சேரர் - பல்லவர் - சோழர் - விஜய நகர அரசு - இந்தியாவில் அயல் நாட்டு நாணயங்கள் - தமிழ் நாட்டில் அயல் நாட்டு நாணயங்கள்.

பாடநூல்

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பார்வை நூல்கள்

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ஒப்பிலக்கியம்
PTAM107

பருவம் : முதல் பருவம் | **தரம் : 04**
பிரிவு : முதன்மைப்பாடம் - III | **மணிநேரம்/வாரம் : 06**
வகுப்பு : I M.A. தமிழ் | **மொத்த மணிநேரம் : 78**

நோக்கம்:
மாணவியர்

- இலக்கியங்களுக்கிடையேயான ஒருமைப்பாட்டை அறிந்து கொள்ளல்.
- ஒப்பியலக்கிய கோட்பாட்டு திறனாய்வுகளை அறிந்துக்கொள்ளல்.
- தமிழ்இலக்கியங்களைப் பிற துறை இலக்கியத்தோடு ஒப்பீட்டு பார்த்தல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- இலக்கியத்தின் ஒப்புமை குறித்து அறிந்து கொள்வர்.
- ஒப்பிலக்கியத்தின் தோற்றம் குறித்து அறிந்து தெளிவர்.
- ஒப்பிலக்கிய வகைகளைக் கையாள்வதில் பயிற்சி பெறுவர்.

அலகு - I ஒப்பிலக்கியம் ஓர் அறிமுகம் 15 மணி நேரம்

ஒப்பிலக்கியம் வரையறை, விளக்கம் - மேனாடுகளில் ஒப்பிலக்கியத் தோற்றம், வளர்ச்சி - ஒப்பிலக்கியம் - உலக இலக்கியம் - பொது இலக்கியம் - தேசியஇலக்கியம்.

அலகு - II தாக்கம், வரவேற்புக் கோட்பாடு 17 மணி நேரம்

போலச்செய்தல் - தாக்கத்திற்கும் போலச்செய்தலுக்கும் உள்ள வேறுபாடு - தாக்காய்வின் நெறிமுறைகள் - தாக்காய்வின் நோக்கம் - படைப்பாளின் பங்களிப்பு - தமிழில் இக்கோட்பாட்டை பொருத்திபார்த்தல் - இணை வரைகள் - தாக்கத்திற்கும் வரவேற்புக்கும் உள்ள வேறுபாடு - படைப்பாளன் - வாசகன் மதிப்பீட்டாளர் - வெளியீட்டாளன் - இலக்கியவரவேற்பு - இலக்கிய சமூகவியல்.

அலகு - III இலக்கிய வகைமை அடிக்கருத்தியல் கோட்பாடு 15 மணி நேரம்

இலக்கிய வகைமைகளின் உருவாக்கம் - ஒப்பிலக்கியத்தில் வகைமை ஆய்வு - வகைமை வரலாறு - இலக்கியம் வகைமை இடையேயான உறவுமுறைகளின் ஆய்வு - உலக அளவில் இலக்கிய வகைமை - தமிழில் இலக்கிய வகைமை - அடிக்கருத்தியல் - சொற்பொருள் விளக்கம்- உருவாக்கம் - அடிக்கருத்தை ஒப்பீட்டு ஆராயும் முறை - அடிக்கருத்துக்கும் துணைக்கருத்துக்கும் உள்ள உறவு.

அலகு - IV தமிழ் இலக்கியங்களில் ஒப்பீடு 15 மணி நேரம்

கபிலர் பரணர் - சிலம்பு மேகலை - திருநாவுக்கரசர் திருத்தாண்டகம், திருமங்கையாழ்வர் திருத்தாண்டகம் - பெரியாழ்வார் திருப்பல்லாண்டு, சேந்தனார் திருப்பல்லாண்டு - திருப்பாவை, திருவெம்பாவை - தொண்டரடிப்பொடியாழ்வர் - திருப்பள்ளி எழுச்சி - மாணிக்க வாசகர் திருப்பள்ளி எழுச்சி - நளவெண்பா நைடதம்.

அலகு - V பிற இலக்கியங்களில் ஒப்பீடு 16 மணி நேரம்

தமிழ் வீரயுகப் பாடல்களும், கிரேக்க வீரயுகப் பாடல்களும் - சங்கப் பாடல்களும் கிரேக்க ஹல்ரிக் பாடல்களும் - தமிழ் முல்லைத் திணைப் பாடல்களும் கிரேக்க முல்லைப்பாடல்களும் - திருக்குறளும் பிறமொழி நீதி இலக்கியங்களும் - கம்பனும் வான்மீகியும்.

பாடநூல்

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பார்வை நூல்கள்

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தமிழ் இலக்கிய சூழலில் பெண்ணியம்

PTAM108

பருவம் : முதல் பருவம் | **தரம் : 04**
பிரிவு : முதன்மைப்பாடம் - IV | **மணிநேரம்/வாரம் : 05**
வகுப்பு : I M.A. தமிழ் | **மொத்த மணிநேரம் : 65**

கற்றலின் நோக்கம்:
மாணவியர்

- தமிழ் பெண்படைப்பாளர்களின் இலக்கியங்களை அறிந்துகொள்ளுதல்.
- இலக்கியங்களில் காணப்படும் பெண்ணிய கருத்தாக்கங்களைத் தெரிந்துகொள்ளுதல்.
- பெண்படைப்பாளர்களின் திறன் அறிந்துகொள்ளுதல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- பெண்ணியச் சிந்தனைகள் குறித்து அறிவர்.
- பெண் எழுத்தாளர்களின் படைப்பாக்க உத்திகள் குறித்த தெளிவினைப் பெறுதல்.
- பெண்ணியத்தின் தேவைக்குறித்து உணர்தல்.

அலகு - 1 பெண்ணியக் கோட்பாடுகள் **15 மணி நேரம்**

பெண்ணிய விளக்கமும் அலைகளும் - மிதவாதப்பெண்ணியம் - மார்க்சியப் பெண்ணியம் சோஷலிசப் பெண்ணியம் - தீவிரவாதப் பெண்ணியம் - ஆன்மீகப் பெண்ணியம் - கலாச்சாரப் பெண்ணியம் - தலித்பெண்ணியம் - இந்தியப்பெண்ணியம் - பெரியார் பெண்ணியம்.

அலகு - 2 தமிழ் பெண் படைப்பாளர்கள் **15 மணி நேரம்**

குட்டிரேவதி - உடலின் கதவு, சுகிர்தராணி - இரவு மிருகம், சல்மா - பச்சை தேவதை, மாலதி மைத்ரி - நீலி, மீனாட்சி - சுடுப்பூக்கள், அம்பை - கறுப்புக்குதிரை சதுக்கம் - பாமா -மனுீ, வன்மம், தமிழ்ச்செல்வி - கண்ணகி, அ.மங்கை - தீனிப்போர், எம்.எஸ்.காந்திமேரி -நளாயினி என்ற ஒரு தீ.

அலகு - 3 இலக்கியத்தில் பெண்கள் **15 மணி நேரம்**

மரபு இலக்கியத்தில் பெண்கள் - பாரதிப்படைப்புகளில் பெண்ணியம் - பெண்சிறுகதை ஆசிரியர்கள் - பெண்நாவலாசிரியர்கள் - மகளிர் இதழ்கள்.

அலகு - 4 இலக்கியமும் மகளிர் மேம்பாடும் **10 மணி நேரம்**

பெண்ணியப் படைப்புகளில் விமர்சனப் பார்வை - பின்நவினத்துவப் பார்வையில் பெண்ணியம்.

அலகு - 5 அரசின் பெண் முன்னேற்றச் செயல்பாடுகள் **10 மணி நேரம்**

பெண்ணியம் - இந்தியாவில் தோற்றமும் வளர்ச்சியும் - காலந்தோறும் பெண்மை - பெண்களும் சட்டங்களும் - பெண்களும் அரசுத்திட்டங்களும் - மகளிர் அமைப்பு - சுயஉதவிக்குழு.

பாடநூல்கள்

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பார்வை நூல்கள்

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நவீன இலக்கியம்

PTAM110

பருவம் : முதல் பருவம் **தரம் : 05**
பிரிவு : முதன்மைப்பாடம் -V **மணிநேரம்/வாரம் : 06**
வகுப்பு : I M.A. தமிழ் **மொத்த மணிநேரம் : 78**

கற்றலின் நோக்கம்

மாணவியர்,

- தமிழில் உள்ள நவீன இலக்கியங்களை அறிந்து கொள்ளுதல்.
- நவீன இலக்கியக் கோட்பாடுகளைப் பொருத்தி ஆய்தல்.
- நவீன படைப்பாக்கத்தை உருவாக்குதல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- நவீன இலக்கியத்தின் மீதான ஆர்வம் மிகும்.
- புதிய இலக்கியத்தின் வடிவங்களை அறிவர்.
- கவிதை, சிறுகதை ஆகியவற்றை படைக்க முயல்வர்.

அலகு - 1 புதுக்கவிதை **15 மணி நேரம்**

சிற்பி - ஒரு கிராமத்து நதி - வெண்ணிலா - நீரில் அலையும் முகம் - ஈரோடு தமிழன்பன் - தோனி வருகிறது - தாமரை - ஒரு கதவும் கொஞ்சம் கள்ளிபாலும் முதல் பத்து கவிதைகள் - மித்ரா - ஹைக்கூ கவிதைகள் முதல் பத்து கவிதைகள்.

அலகு - 2 சிறுகதை **15 மணி நேரம்**

ஜெயகாந்தன் - ஒரே நண்பன் - எஸ்.ராமகிருஸ்ணன் - பாதம் - அம்பை - ஒரு கருப்புச் சிலந்தியுடன் ஓர் இரவு - புதுமைப்பித்தன் - புதிய கூண்டு - பாமா - ஒரு தாத்தாவும் எருமையும்.

அலகு - 3 புதினம் **15 மணி நேரம்**

அசோகமித்திரன் - கரைந்த நிழல்கள் - கி. ராஜநாராயணன் - கோபல்ல கிராமம்

அலகு - 4 நாடகம் **15 மணி நேரம்**

மு. இராமசாமி - தமிழில் சோதனை நாடகங்கள் - சுந்தர ராமசாமி - உடல்.

அலகு- 5 கட்டுரை, தன் வரலாறு **15 மணி நேரம்**

ரா.பி.சேதுப்பிள்ளை - தமிழ் இன்பம் (முதல் ஐந்து கட்டுரைகள்) - உ.வே.சாமிநாதையர் - என் சரித்திரம்.

பாடநூல்கள்

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- ராமகிருஸ்ணன், எஸ். (2011). *சிறுகதைகள்.* விஜயா பதிப்பகம். கோவை.
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பார்வை நூல்கள்

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தொல்காப்பியம் - சொல்லதிகாரம்
PTAM203

பருவம் : இரண்டாம் பருவம் | **தரம் : 04**
பிரிவு : முதன்மைப்பாடம் -VI | **மணிநேரம் வாரம் : 05**
வகுப்பு : I M.A. தமிழ் | **மொத்த மணிநேரம் : 65**

நோக்கம்:
மாணவியர்

- தமிழ் இலக்கணத்தில் சொற்களில் ஏற்படும் குற்றங்களை அறிதல்.
- வாக்கியங்களை அமைக்கும் முறையினையும் சொற்களின் வகைகளையும் அறிந்து கொள்ளுதல்.
- சொற்த்தொடர் அமைக்கும் முறையை அறிந்து கொள்ளுதல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- தமிழ் இலக்கணத்தின் சொற்களை திறம்பட அறிவர்.
- சொல் இலக்கணம் குறித்த புரிதலைப் பெறுவர்.
- தொடர் அமைப்புகளை சரியாக பயன்படுத்தும் முறைகளை உணர்வர்.

அலகு - 1 — **12 மணி நேரம்**
கிளவியாக்கம்

அலகு - 2 — **13 மணி நேரம்**
வேற்றுமையியல், வேற்றுமை மயங்கியல்

அலகு - 3 — **12 மணி நேரம்**
விளிமரபு, பெயரியல்

அலகு - 4 — **14 மணி நேரம்**
வினையியல், இடையியல்

அலகு - 5 — **14 மணி நேரம்**
உரியியல், எச்சவியல்

பாடநூல்

- தொல்காப்பியம் *சொல்லதிகாரம்.* (2003). (சேனாவரையர் உரை). தமிழ்மண் பதிப்பகம். சென்னை.

பார்வை நுல்கள்

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திறனாய்வுக்கோட்பாடுகள்
PTAM209

பருவம் : இரண்டாம் பருவம் | **தரம் : 04**
பிரிவு : முதன்மைப்பாடம் -VII | **மணிநேரம்/வாரம் : 05**
வகுப்பு : I M.A. தமிழ் | **மொத்த மணிநேரம் : 65**

நோக்கம்:
மாணவியர்

- உலகளாவியத் திறனாய்வுக் கோட்பாடுகளை அறிந்து கொள்ளல்.
- கோட்பாடுகளை இலக்கியத்தோடு ஒப்பீட்டு திறனாய்வுச் செய்தல்.
- திறனாய்வின் வகைகளை அறிந்து கொள்ளல்

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- திறனாய்வுக் கோட்பாடுகளை மற்றும் அமைப்புகள குறித்து அறிவர்.
- திறனாய்வு அணுகுமுறைகளை சரியாக உணர்வர்.
- திறனாய்வு கூறுகள் பற்றிய தெளிவினை பெறுவர்.

அலகு - 1 அறிமுகமும் - புதுத்திறனாய்வும் **13 மணி நேரம்**

இலக்கியக்கோட்பாடு - இலக்கியத்திறனாய்வு - இலக்கியவரலாறு ஆகியவற்றிற்கிடையிலான வேறுபாடு - புதுத்திறனாய்வு தோற்றம் வளர்ச்சி முதல் - தமிழிலக்கியச் சூழல் வரை.

அலகு - 2 முதல் நிலைத்திறனாய்வுகள் **13 மணி நேரம்**

வரலாற்றியல் திறனாய்வு - தோற்றம் வளர்ச்சி - திறனாய்வு முறை - மொழியியல் திறனாய்வு - மொழியியல் திறனாய்வும் ரோமன் யாக்கப்சனும் முதல் - இலக்கியமும் சமூக மொழியியலும் - ஒப்பிலக்கியத் திறனாய்வு - திறனாய்விற்கான அடிப்படை - அடிக்கருத்து குறிப்பொருள் - சமூகவியல் திறனாய்வு- சமுதாயப் பின்னணி சமுதாய சிக்கல்கள்.

அலகு - 3 இரண்டாம் நிலைத் திறனாய்வுகள் **13 மணி நேரம்**

மார்க்சியத் திறனாய்வு - இயங்கியல் பொருள்முதல்வாதம் - தமிழியல் மார்க்சியத் திறனாய்வு - உளப்பகுப்பாய்வுத்திறனாய்வு - உளவியல் அணுகுமுறையும் மனப்பாதிப்புக்களும் -தமிழியல் உளவியல் அணுகுமுறை - தொன்மத் திறனாய்வு - தொன்மம் பலவகைகள் - தொன்மமும் மொழியும்.

அலகு - 4 மூன்றாம் நிலைத் திறனாய்வுகள் **13 மணி நேரம்**

அமைப்பியல் - பின் அமைப்பியல் - சிதைவாக்கத் திறனாய்வு வரையறை ஒற்றுமை வேற்றுமைக் கூறுகள் - எடுத்துரைப்பியல் திறனாய்வு - எடுத்துரைப்பின் அடிப்படை அலகுகள் - பனுவலும் வாசித்தலும் - பின்நவீனத்துவத் திறனாய்வு - நவீனத்துவம் பின்நவீனத்துவம் விளக்கம் - தமிழ்ச்சூழலில் பின்நவீனத்துவம் - பெண்ணியத் திறனாய்வு - சொல் விளக்கம் தலித் பெண்ணியம் - தலித்திலக்கியத் திறனாய்வு – 'தலித்' சொல் விளக்கம் - தலித்திலக்கியத்தைத் தலித் அல்லாதார் எழுதக்கூடுமா.

அலகு - 5 நவீனத் திறனாய்வுகள் **13 மணி நேரம்**

பின்காலனித்துவத் திறனாய்வு - தோன்றிய சூழல் - பின்காலனித்துவத் திறனாய்வாளர்கள் புனித மூவர் - புலம்பெயர் இலக்கியத் திறனாய்வு - சொல் விளக்கமும் வரையறையும் - புலம்பெயர் சமூகத்தின் பொதுவான பண்புகள் - சூழலியத் திறனாய்வு - தோற்றம் வரையறை - சூழலியத் திறனாய்வின் அணுகுமுறைகள்.

பாடநூல்

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பார்வை நூல்கள்

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அற இலக்கியங்கள்
PTAM210

பருவம் : இரண்டாம் பருவம் | **தரம் : 03**
பிரிவு : முதன்மைப்பாடம் -IX | **மணிநேரம்/வாரம் : 04**
வகுப்பு : I M.A. தமிழ் | **மொத்த மணிநேரம் : 52**

நோக்கம்:
மாணவியர்

- வாழ்வியல் நெறிகளை உணர்ந்து கொள்ளுதல்.
- வாழ்வியல் நெறிகளை அறிந்து அற இலக்கியங்கள் வழி நல்வழிப்படுதல்
- அறக் கருத்துக்கள் குறித்து தெளிவுபெறுதல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- அற இலக்கிய சிந்தனைகளை அறிவர்.
- அற இலக்கியத்தின் தேவையினை உணர்வர்.
- சமுதாயத்திற்கு அற இலக்கியத்தின் தேவைக் குறித்து அறிந்து தெளிவர்.

அலகு - 1 திருக்குறள், நாலடியார் 12 மணி நேரம்

திருக்குறள் - அன்புடைமை, இனியவை கூறல், சொல்வன்மை, நாலடியார் - முதல் பத்து பாடல்கள் பழமொழி நானூறு - முதல் பத்து பாடல்கள், நான்மணிக்கடிகை - முதல் பத்து பாடல்கள்.

அலகு - 2 சிறுபஞ்சமூலம், ஏலாதி 10 மணி நேரம்

திரிகடுகம் - முதல் பத்து பாடல்கள், சிறுபஞ்சமூலம் - முதல் பத்து பாடல்கள், ஆசாரக்கோவை - முதல் பத்து பாடல்கள், ஏலாதி - முதல் பத்து பாடல்கள்.

அலகு - 3 இன்னா நாற்பது, இனியவை நாற்பது 10 மணி நேரம்

இன்னா நாற்பது - முதல் பத்து பாடல்கள், இனியவை நாற்பது - முதல் பத்து பாடல்கள், முதுமொழிக்காஞ்சி - முதல் பத்து பாடல்கள், பெரும்பொருள் விளக்கம் - முதல் பத்து பாடல்கள்.

அலகு - 4 பிற்கால நூல்கள் 10 மணி நேரம்

ஆத்திச்சூடி - முதல் பத்து பாடல்கள். கொன்றைவேந்தன் - முதல் பத்து பாடல்கள். வெண்பாமாலை - முதல் பத்து பாடல்கள்- நல்வழி - முதல் பத்து பாடல்கள்- நன்னெறி - முதல் பத்து பாடல்கள்.

அலகு - 5 பிற்கால நூல்கள் 10 மணி நேரம்

வாக்குண்டாம் - முதல் பத்து பாடல்கள். வெற்றிவேற்கை - முதல் பத்து பாடல்கள்- நீதிவெண்பா - முதல் பத்து பாடல்கள். உலகநீதி - முதல் பத்து பாடல்கள்.

பாடநூல்கள்

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பார்வை நூல்கள்

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- மாதவன், சு. (2009). *தமிழ் அற இலக்கியங்களும் பௌத்த சமண அறங்களும்.* செம்மொழி பதிப்பகம். தஞ்சாவூர்.

அகராதியியல்
PTAM211

பருவம் : இரண்டாம் பருவம்	**தரம் : 03**
பிரிவு : முதன்மைப்பாடம் -X	**மணிநேரம் வாரம் : 05**
வகுப்பு : I M.A. தமிழ்	**மொத்த மணிநேரம் : 65**

நோக்கம்:
மாணவியர்

- அகராதி வரலாற்றினை அறிந்து கொள்ளல்.
- அகராதி உருவாக்க முயற்சிகளில் ஈடுபடல்.
- சொற்களின் பொருள்களை அறிந்து கொள்ளுதல்

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- அகராதியின் தேவைகளை உணர்வர்.
- அகராதியின் வகைகள் குறித்து உணர்ந்து தெளிவர்.
- அகராதியில் உள்ள சொற்களை நடைமுறையில் பயன்படுத்துவர்.
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அலகு - 1 அகராதிக்கலை 12 மணி நேரம்

அகராதியியல் - சொல், விளக்கம் - வரலாறு, இலக்கணமும் அகராதியியலும் அகராதியியலும் மொழியியலும் - உலக அகராதி வரலாறு - தமிழ் அகராதி வரலாறு சொற்பொருள் மரபு - நிகண்டு மரபு - நிகண்டுகளின் தோற்றம் - பொது அமைப்பு, வளர்ச்சி நிலை, பிற்கால நிகண்டுகள்

அலகு - 2 சொற்பொருண்மையியல் 13 மணி நேரம்

சொல்லும் - பொருளும் - விளக்கம் - உலகப் பொருள் தொடர்பு - பொருள் கோட்பாடுகள் - பொருள் முக்கோணக் கொள்கை - பொருட் கூறுகள் - சொல் வகைப்பாடுகள்.

அலகு - 3 அகராதி வகைகள் 14 மணி நேரம்

கலைக்களஞ்சியம் - வரையறை, தோற்றம், வளர்ச்சி,வகை, வாழ்வியல் களஞ்சியம -அறிவியல் களஞ்சியம் - சிறப்புக் கலைக்களஞ்சியம் - ஆய்வடங்கல் வகைகள். பொது அகராதிகள் - சிறப்பு அகராதிகள் - ஒருமொழி இரு மொழி - பன் மொழி அகராதிகள் - கால நிரல் அகராதிகள் - குறித்த கால நிலை அகராதி, வரலாற்று அகராதி - ஒப்பியல் அகராதி -வட்டார வழக்கு அகராதி - கணினி வழியிலான அகராதிகள்.

அலகு - 4 அகராதி உருவாக்க அடிப்படைகள் 13 மணி நேரம்

திட்டமிடல் - ஆதார நூல் தொகுதி - சொல் உருவாக்கம் - சொல் தெளிவு முறைகள் - சொல் வேறுபாடுகள் - கூட்டுச்சொற்கள் - மொழி வேறுபாடுகள் - தனிமனிதப் பேச்சு.

அலகு - 5 அகராதி உருவாக்கம் 13 மணி நேரம்

அகராதி பதிவுக் கூறுகள் - தலைச்சொல் பகுதி - தலைச்சொல் - அடிப்படை வடிவம் -எழுத்துப் பெயர்ப்பு - உச்சரிப்பு இலக்கணக் குறிப்பு - சொற் பிறப்பு - சொற்பொருள் தரு நெறிகள் - எதிர்ச் சொல்- விளக்கச் சொற்பொருள் - வெளிப்படைக் குறுக்கு நோக்கீடு –மறைமுகக் குறுக்கு நோக்கீடு, மேற்கோள் தரு நெறி - விளக்கக்குறிப்புகள் - சொற்பொருள் விளக்கக் குறிப்பு - இலக்கண விளக்கக் குறிப்பு- கலைக்களஞ்சிய இலக்கணக் குறிப்பு -அச்சுப்படி தயாரித்தல் - வரிசை முறை - அகர வரிசை முறை - பொருண்மை வரிசை முறை -பிற வரிசை முறைகள் - பதிவு வரிசை முறைகள் - பதிவுத் தொகுப்பு - தொடர் பதிவு - துணைப் பதிவு – பயன்பாட்டாளர் குறிப்பு - மாதிரிப் பதிவு - பின்னிணைப்புகள்.

பாடநூல்கள்

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பார்வை நூல்கள்

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காப்பியங்கள்
PTAM213

பருவம் : இரண்டாம் பருவம் **தரம் : 04**
பிரிவு : முதன்மைப்பாடம் - X **மணிநேரம் வாரம் : 05**
வகுப்பு : I M.A. தமிழ் **மொத்த மணிநேரம் : 65**

நோக்கம்:

மாணவியர்

- வரலாற்று நிகழ்வுகளைக் கண்டறிவதற்கும், புராணக் கருத்துக்களை அறிந்து கொள்வதற்குமான வழிமுறைகளை எடுத்துரைத்தல்.
- காப்பியங்களின் தொன்மையினையும் சிறப்புக் கூறுகளையும் கண்டறிதல்.
- வரலாற்று நிகழ்வுகளைப் பற்றிய புரிதலைப் பெறுதல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- காப்பியங்கள் காலந்தோறும் தோன்றி வளர்ந்த வரலாற்றை அறிவர்.
- காப்பியத்திற்கும் அரசியல் வரலாற்றுக்கும் இடையே உள்ள உறவை அறிவர்.
- காப்பிய நூல்களின் தோற்றக் காரணிகளை அறிந்து கொள்வர்.

அலகு - 1 **12 மணி நேரம்**

சிலப்பதிகாரம் - புகார் காண்டம் - இந்திர விழவு ஊர் எடுத்தக்காதை - மதுரைக் காண்டம் - கொலைக்களக் காதை - வஞ்சிக் காண்டம் - கால்கோட் காதை - மணிமேகலை - மலர்வனம் புக்க காதை.

அலகு - 2 **12 மணி நேரம்**

சீவக சிந்தாமணி - பதுமையார் இலம்பகம் - பெரிய புராணம் - பூசலார் நாயனார் புராணம்

அலகு - 3 **12 மணி நேரம்**

கம்பராமாயணம் - வாலி வதைப்படலம் - கும்பகர்ண வதைப்படலம்.

அலகு - 4 **12 மணி நேரம்**

தேம்பாவணி - நாட்டுப்படலம் (முழுவதும்).

அலகு - 5 **12 மணி நேரம்**

சீறாப்புராணம் - இரண்டாம் காண்டம் (நுபுவ்வத்துக்காண்டம்)

பாடநூல்கள்

- *புலியூர்கேசிகன். (ப.ஆ). (*2009). *சிலப்பதிகாரம்.* கழக வெளியீடு. சென்னை.
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சுற்றுலாவியல்
PTAE202

பருவம் : இரண்டாம் பருவம் | **தரம் : 04**
பிரிவு : துறைசாரா விருப்பப்பாடம் - I | **மணிநேரம்/வாரம் : 05**
வகுப்பு : பிற துறை மாணவியர்கள் | **மொத்த மணிநேரம் : 65**

நோக்கம்

- சுற்றுலா இடங்களைப் பற்றி அறிந்துகொள்ளல்.
- சுற்றுலாவின் பண்பாட்டு கலாச்சாரத்தினை தெரிந்து கொள்ளல்.
- சுற்றுலா துறையில் பணி வாய்ப்பினை அறிந்து கொள்ளுதல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- சுற்றுலா தலங்கள் மற்றும் அதன் சிறப்புகள் குறித்து அறிந்து தெளிவர்.
- சுற்றுலாவின் பயன்பாடுகள் குறித்த தெளிவினைப் பெறுவர்.
- சுற்றுலா துறையில் பணி வாய்ப்பினை பெறுவர்.

அலகு - 1 **13 மணி நேரம்**

சுற்றுலாவியல் அறிமுகம் - சுற்றுலாவியல் - அறிஞர்களின் விளக்கங்கள் - சுற்றுலா வகைகள்.

அலகு - 2 **13 மணி நேரம்**

சுற்றுலா வளர்ச்சிக்கானக் காரணங்கள் - தடைகள் - சுற்றுலா – சமூக கலாச்சார முக்கியம் - சுற்றுலா அமைப்பாளர்கள் - சுற்றுலா வழிகாட்டிகள்.

அலகு - 3 **14 மணி நேரம்**

தமிழகத்தில் சுற்றுலா வளர்ச்சி – தமிழக அரசின் செயல்பாடுகள் - தமிழக சுற்றுலா வளர்ச்சிக் கழகம் - சிறப்புப் பணிகள் - சுற்றுலாவின் பயன்பாடு.

அலகு - 4 **13 மணி நேரம்**

தமிழ்நாட்டின் சுற்றுலாத் தலங்கள்.

அலகு - 5 **12 மணி நேரம்**

சுற்றுலா மேம்பாடு – பொது அறிவிப்பு - விளம்பரம் செய்யப்படும் சாதனங்களும் விளம்பங்களும் – பொதுமக்கள் தொடர்பு - சுற்றுலா விளம்பரம்.

பாடநூல்

- தங்கமணி, ம. இ.ரா. (2006). *சுற்றுலாவியல் ஓர் அறிமுகம்.* முத்துப் பதிப்பகம். புதுக்கோட்டை.
- ஈஸ்வரன், ச. (2010). *சுற்றுலாவியல் ஓர் அறிமுகம்.* சாரதா பதிப்பகம். சென்னை.

பார்வை நூல்கள்

- கிருஸ்ணசாமி. வெ. (2012). *சுற்றுலா வளர்ச்சி.* மணிவாசகர் பதிப்பகம். சென்னை.
- ஈஸ்வரன், ச. (2009). *சுற்றுலாவியல்.* பாவை பப்ளிகேன்ஸ். சென்னை.
- திருநாவுக்கரசு, வெ. (2000). *தமிழகச் சுற்றுலா மையங்கள்.* உமா பதிப்பகம். சென்னை.

பயன்பாட்டுத்தமிழ்
PTAX 202

பருவம் : இரண்டாம் பருவம் **தரம் : 01**
பிரிவு : சேவைக்கல்வி **மொத்த மணி நேரம் : 40**
வகுப்பு : I M.A. தமிழ்

நோக்கம் :

- பள்ளி மாணவர்களுக்குத் அடிப்படை இலக்கணம் கற்பித்தல்
- தவறில்லாமல் தமிழ்மொழியை கற்பித்தல்.
- தமிழ்மொழியை தெளிவாக பேச பயிற்சி அளித்தல்.

பயன்

- கற்பித்தல் திறனை மேம்படுத்திக் கொள்வர்.
- தவறில்லாமல் தமிழ் மொழியினை கற்பிக்கும் திறனை அடைவர்.
- மாணவர்கள் நிலையறிந்து கற்பிக்கும் திறன் பெறுவர்.

அலகு - 1 இலக்கணப்பிழை நீக்கி எழுதுதல் **10 மணி நேரம்**

திணை, பால், எண், இடம், காலம் பற்றி அறிதல் மற்றும் அதன் பிழை நீக்கி எழுதுதல்

அலகு - 2 மயங்கொலிப் பிழைகள் **10 மணி நேரம்**

ந-ண-ன வேறுபாடுகள், ல-ள-ழ வேறுபாடுகள், ர-ற வேறுபாடுகள்.

அலகு - 3 வலி மிகுதல் **06 மணி நேரம்**

வலி மிகுதலும் மிகாமையும்- வலி மிகும் விதிகளின் தொகுப்பு- வலி மிகாமைக்குரிய விதிகள்.

அலகு - 4 தொடர் பிழை நீக்கி எழுதுதல் **08 மணி நேரம்**

வாக்கிய வகைகளும் அமைக்கும் முறைகளும் - வாக்கிய வரலாறு - வாக்கியம் - வாக்கிய வகைகள் கருத்து வகை:செய்தி வாக்கியம் - வினாவாக்கியம் - விரைவு வாக்கியம் - உணர்ச்சி வாக்கியம், அமைப்பு வகை, தனி வாக்கியம் - தொடர் வாக்கியம்-கலவை வாக்கியம்

அலகு - 5 பிறமொழிச்சொற்களை நீக்கி எழுதுதல் **06 மணி நேரம்**

திசைச்சொற்கள், வடமொழிச்சொற்கள் மற்றும் ஆங்கிலச்சொற்களை நீக்கி எழுதுதல்

பாடநூல்கள்

- பரந்தாமனார், அ.கி. *நல்ல தமிழ் எழுத வேண்டும்.* பாரி நிலையம். பிரகாசம் சாலை. சென்னை.
- தமிழண்ணல். *உங்கள் தமிழைத் தெரிந்து கொள்ளுங்கள்.* சர்வோதய இலக்கியப் பண்ணை. மதுரை.

பார்வை நூல்கள்

- நு.ச்.மான், எம்.ஏ. (2000). *அடிப்படைத் தமிழ் இலக்கணம்.* பூபாலசிங்கம் புத்தக நிலையம். கொழும்பு.
- பொற்கோ. (2002). *இக்கால தமிழ் இலக்கணம்.* பூம்பொழில் வெளியீடு. சென்னை.
- மருதூர் அரங்கராசன். (2004). *தவறின்றி தமிழ் எழுத.* ஐந்திணைப் பதிப்பகம். சென்னை.

பாடத்திட்ட அமைப்பு

அகமதிப்பீட்டிற்கான III ஆம் மற்றும் IV ஆம் உட்கூறுகள்

முதுகலைத்தமிழ்

பருவம்	வகை	பாடக் குறியீடு	பாடத்தலைப்பு	III உட்கூறுகள்	IV உட்கூறுகள்
I	முதன்மைப்பாடம் - I	PTAM102	தொல்காப்பியம் - எழுத்ததிகாரம்	கருத்தரங்கம்	இலக்கண ஒப்பீடு
	முதன்மைப்பாடம் -II	PTAM104	தொல்லியல்	தல வரலாறு	கள ஆய்வு
	முதன்மைப்பாடம் - III	PTAM107	ஒப்பிலக்கியம்	கருத்தரங்கம்	இலக்கிய ஒப்பீடு
	முதன்மைப்பாடம் - IV	PTAM108	தமிழ் இலக்கிய சூழலில் பெண்ணியம்	படைப்பு நூல் மதிப்புரை	நூல் பட்டியல் தயாரித்தல்
	முதன்மைப்பாடம் - V	PTAM111	நவீன இலக்கியம்	கருத்தரங்கம்	கவிதை/ சிறுகதை எழுதுதல்
II	முதன்மைப்பாடம் - VI	PTAM203	தொல்காப்பியம் - சொல்லதிகாரம்	கருத்தரங்கம்	இலக்கணக் குறிப்பினைக் கண்டறிதல்
	முதன்மைப்பாடம் - VII	PTAM209	திறனாய்வுக் கோட்பாடுகள்	கருத்தரங்கம்	கள ஆய்வு
	முதன்மைப்பாடம் - VIII	PTAM210	அற இலக்கியங்கள்	திறனாய்வுக் கோட்பாட்டை பொருத்திப் பார்த்தல்	நூல் பட்டியல் தயாரித்தல்
	முதன்மைப்பாடம் - IX	PTAM211	அகராதியியல்	கருத்தரங்கம்	பிறமொழி ஒப்பீடு
	முதன்மைப்பாடம் - X	PTAM213	காப்பியங்கள்	கருத்தரங்கம்	நூல் மதிப்பீடு
	துறைசாரா விருப்பப் பாடம்- II	PTAE202	சுற்றுலாவியல்	கருத்தரங்கம்	கள ஆய்வு

DEPARTMENT OF ENGLISH

PREAMBLE

UG: Programme Profile and the Syllabi of Courses offered in the I and II Semesters along with Evaluation Components III & IV (With effect from 2021-2024 Batch onwards)

PG: Programme Profile and the Syllabi of courses offered in the I and II Semesters along with Evaluation Components III & IV (With effect from 2021-2023 Batch onwards)

PROGRAMME PROFILE B.A. ENGLISH

Programme Specific Outcomes (PSO)

Upon Completion of the Programme, the Students will be able to

- Apply the Critical Pondering in different Forms of Literature.
- Analyze the Socio-Political aspects in Literary Texts.
- Compare the Cultural context in different Literature and Analyze the Literary Text.
- Pronounce and Transcribe the Sounds of English Language with Perfect Stress and Intonation.

Semester	Part	Category	Course Code	Course Title	Previous Course Code	Contact Hrs/Week	Credit Min/Max
I	I	Language/ AECC-II	UTAL107/ UTAL108/ UHIL 101/ UFRL 101	Basic Tamil I Advanced Tamil I Hindi I/ French I	UTAL103/ UTAL104	5	¾
	II	English/ AECC-I	UENL109/ UENL110	English for Communication (Stream –I)/ English for Communication (Stream – II)	-	5	¾
	III	Major Core I/ DSC	UENM110	Indian Writing in English	UENM401, UENM403 UENM305	6	5
	III	Major Core II/ DSC	UENM111	British Literature- I	-	6	5
	III	Allied(GE) I	UENA104	Literary Forms	-	6	4
	III	PE	UPEM101	Professional English –I	-	6	4
	IV	VE(SEC)		Family Life Education		2	2
					TOTAL	**36**	**26/28**
II	I	Language/ AECC-II	UTAL205/ UTAL206/ UHIL 201/ UFRL 201	Basic Tamil II Advanced Tamil II Hindi II/ French II	UTAL203/ UTAL204	5	¾
	II	English/ AECC-I	UENL209/ UENL210	English for Communication (Stream – I)/ English for Communication (Stream – II)	-	5	¾
	III	Major Core III/ DSC	UENM209	British Literature- II	-	6	4
	III	Major Core IV/ DSC	UENM210	American Literature	UENM502, UENM506, UENM306	5	4

II	III	PE	UPEM201	Professional English –II	-	6	4
	IV	SEC/NME	UENE203/	Film Studies/	-	3	2
			UENE204	Public Speaking			
	V	Extension Activity/ Physical Education				-	½
					TOTAL	**36**	**25/28**
III	I	Language/ AECC-II	UTAL307/ UTAL308/ UHIL 301/ UFRL 101	Basic Tamil I Advanced Tamil I Hindi I/ French I	UTAL103/ UTAL104	5	¾
	II	English/ AECC-I	UENL309/ UENL 310	English for Communication (Stream - I)/ English for Communication (Stream – II)	-	5	¾
	III	Major Core V/ DSC	UENM307	Introduction to Linguistics	-	4	4
	III	Major Core VI / DSC	UENM308	Introduction to Comparative Literature	-	5	5
	III	Allied(GE) III	UENA304	Introduction to English Language Teaching	-	6	4
	IV	SEC		Environmental Studies	-	2	1
	IV	Online course	UONL301	Online course		3	½
					TOTAL	**30**	**21/24**
IV	I	Language/ AECC-II	UTAL407/ UTAL408/ UHIL 401/ UFRL 401	Basic Tamil II Advanced Tamil II Hindi II/ French II	UTAL203/ UTAL204	5	¾
	II	English/ AECC-I	UENL409/ UENL410	English for Communication (Stream – I)/ English for Communication (Stream – II)	-	5	¾
	III	Major Core VII/ DSC	UENM408	Shakespeare	UENM508 UENM612	5	5
	III	Major Core VIII/ DSC	UENM409	Cinema and Literature	-	5	5
	III	Allied(GE) IV	UENA404	Phonetics and Spoken English	-	5	5
	IV	SEC/Non Major Elective	UENE401/ UENE402	One Act Play/ Media Writing	-	3	2
	IV	SEC/ Soft Skills		Personality Development	-	2	1
	V	Extension Activity/ Physical Education			-		-/2
					TOTAL	**30**	**24/28**
V	III	Major Core IX/ DSC	UENM516	Popular Literature	-	6	5
	III	Major Core X/ DSC	UENM517	Australian and Canadian Literature	-	6	5

	III	Major Core XI/ DSC	UENM518	Literary Criticism	UENM503, UENM507, UENM512	6	6
	III	Major Core IX/ DSC	UENM516	Popular Literature	-	6	5
V	III	Major Core X/ DSC	UENM517	Australian and Canadian Literature	-	6	5
	III	Major Core XI/ DSC	UENM518	Literary Criticism	UENM503, UENM507, UENM512	6	6
	III	Major Elective/ DSE I	UENO501/ UENO502	Detective Fiction/ World Classics in Translation	-	5	4
	III	Core XII Project	UENP501	Project/ Basics of Translation	-	5	5
	IV	VE/SEC		Cyber Security/ Health Issues	-	2	1
					TOTAL	**30**	**26**
VI	III	Major Core XIII/ DSC	UENM614	Introduction to Feminism	-	6	5
	III	Major Core XIV/ DSC	UENM615	Asian Literature in English	-	6	5
	III	Major Core XV/ DSC	UENM616	Diasporic Literature	UENM504, UENM405	6	5
	III	Major Core XVI/ DSC	UENM617	Women's Life Writing	-	5	5
	III	Major Elective /DSE II	UENO605/ UENO606	Creative Writing/ English for Competitive Exams	-	5	4
	III	Major Core XVII	UENC602	Comprehensive Viva Voce	UENC601	-	1
	IV	Soft Skills/ SEC		Career Skill/ Foundation Course on Entrepreneurship and Innovation		2	1
	V	Extension Activity/ Physical Education				-	-/2
					TOTAL	**30**	**26/28**
					GRAND TOTAL	**192**	**148/162**

NON MAJOR ELECTIVES

Semester	Part	Category	Course Code	Course Title	Contact/ Week	Credit
II	IV	NON MAJOR ELECTIVES	UENE202	Business Writing	3	2
			UENE203	Film Studies		
			UENE204	Public Speaking		
IV	IV	NON MAJOR ELECTIVES	UENE401	One Act Play	3	2
			UENE402	Media Writing		
			UENE403	Media Studies		
			UENE404	News Reporting: Theory and Practice		

MAJOR ELECTIVES

Semester	Part	Category	Course Code	Course Title	Contact/ Week	Credit
V	III	MAJOR ELECTIVES	UENO501	Detective Fiction	5	4
			UENO502	World Classics in Translation		
VI	III	MAJOR ELECTIVES	UENO605	Creative Writing	5	4
			UENO606	English for Competitive Exam		

EXTRA CREDIT EARNING PROVISION

Semester	Part	Category	Course Code	Course Title	Contact Hrs/week	Credit
II	III	Core	UENI201	Summer Internship	-	1
IV	III	Core	UENI401	Summer Internship	-	1
V	III	Core	UENS502	Practice of Translation (Self – Study)	26	1
VI	III	Core	UENP601	Mini-Project	26	1

EXPERIENTIAL LEARNING (MANDATORY)

Semester	Part	Category	Course Code	Course Title	Collaborating Agency	Hours/Days/ Months	Mode of Evaluation	Credits
								Max/Min
III	III	Allied	UENA304	Introduction to English Language Teaching	MSME	2 days	Reflection	1

INDIAN WRITING IN ENGLISH

UENM110

Semester: I	**Credits : 5**
Category: Core I	**Hours/Week : 6**
Class & Major: I BA English	**Total Hours :78**

Objectives:

To enable the Students

- Familiarize Learners to a wide range of Indian Writing originally written in English and translated from Indian Languages.
- Acquaint learners with Indian Diaspora Writings and their Characteristics Features.
- Understand the "Indianness" from Representative Works.

Learning Outcomes:

On Completion of the Course, the Students will be able to

- Provide an Overview of the various Phases of the Evolution of Indian writing in English.
- Analyse the Thematic concerns, Genres and Trends of Indian Writing in English.
- Develop Critical Thinking in Indian Perspective of Literature in Students.

UNIT I POETRY **13 Hour**

Sarojini Naidu	:	Song of Radha, The Milkmaid
Sri Aurobindo	:	The Stone Goddess
Nisim Ezekiel	:	Night of the Scorpion
A.K.Ramanujan	:	Love Poem for a Wife
Kamala Das	:	Spelling the Name

UNIT II PROSE **17 Hour**

Jawaharlal Nehru	:	The Discovery of India
Ananda Commarasamy Aurobindo	:	The Dance of Shiva

UNIT III SHORT STORIES **17 Hour**

R K Narayan	:	An Astrologers Day
Ruskin Bond	:	The Eyes Have it

UNIT IV DRAMA **15 Hour**

Mahesh Dattani	:	Dance Like A Man
Dina Metha	:	Brides Are Not For Burning

UNIT V FICTION **16 Hour**

R.K.Narayan	:	The English Teacher
Raja Rao	:	The Serpent and The Rope

Text Books

- Naik , M. K. (2012). *A History of Indian English Literature*. Sahitya Akademi. New Delhi.
- Bayapa Reddy, P. (2018). *Studies in Indian Writing in English: With a Focus on Indian English Drama*. Surjeet Publications. New Delhi.

Reference Books

- Srinivasa Iyengar, K. R. (2012). *Indian Writing in English*. Sterling Publishers. Chennai.
- Bruce King. ed. (2005). *Modern Indian Poetry in English*. OUP. New Delhi.
- Prasad, R. C. and J. P. Singh. (2009). *An Anthology of Indian English Prose Motilal Banarsidass*. New Delhi.
- Erin Fallon. (2013). *Reader's Companion to the Short Story in English*. Rutledge Pub. USA.
- Naik, M.K. et al. (2007). *Critical Essay on Indian Writing in English*. The Macmillan Company of India. Chennai.
- Gargi Balwant. (2000). *Theatre in India*. Theatre Art Books. New York.
- Lyengar, K.R.S. (2011). *Drama in Modern India and the Writer's Responsibility in a Rapidly Changing World*. The P.E.N. All India Centre. Bombay.

E –Resources

- www.indianwriting in poems, prose, essays and fiction.
- www.britannica.com
- www.myexamsolution.com/2019/08/-biography.html
- https://pdfcoffee.com/list-of-books-pdf-free.html
- https://archive.org/Indian English literature.
- http://www.indiaonline.in/about/personalities/writersandpoets/a-kramanujan
- http://www.indiaonline.in/about/personalities/writersandpoets/Nisim Ezekiel
- http://www.indiaonline.in/about/personalities/writersandpoets/ Kamala Das

BRITISH LITERATURE I

UENM111

Semester	**: I**	**Credits**	**: 5**
Category	**: Core II**	**Hours/Week**	**: 6**
Class &Major	**: I B.A. English**	**Total hours**	**: 78**

Objectives:

To enable the Students

- Understand the Social and Political situation of England in the 14th and 15th Century.
- Remember, Analyse, and Evaluate the Poetry and the Style of Poets belonging to the age of Chaucer and Spenser.
- Appreciate and critically Analyse the Prescribed Fiction in terms of Plot, Characterization and Themes.

Learning Outcomes:

On Completion of the Course, the Students will be able to

- Understand the Purpose of Chaucer's Writing and Analyse the Portraits he painted through his Description.
- Explain the Aphoristic Style and Comprehend the ideas present in Bacon's Essays.
- Appreciate and Critically Analyse the Prescribed Fiction.

UNIT I INTRODUCTION **15 Hour**

The Renaissance and its Impact on England - The Reformation - Causes and Effects - The Commonwealth of Nations - The Restoration, Coffee-houses and their Social relevance.

UNIT II POETRY **17 Hour**

Geoffrey Chaucer	:	The Love Unfeigned
Edmund Spencer	:	Prologue to the Faerie Queen
Sir Phillip Sydney	:	The Nightingale
William Shakespeare	:	Sonnet No: 116, 94

UNIT III PROSE **15 Hour**

Francis Bacon	:	Of Friendship, Of Books, Of Great Place

UNIT IV DRAMA **15 Hour**

Christopher Marlowe	:	Edward II

UNIT V NOVEL **16 Hour**

John Bunyan	:	The Pilgrims Progress

Text Book

- Francis Bacon. (2012). *Complete Essays.* Penguins. London.
- John Bunyan. (2000). *The Pilgrim's Progress.* Routeledge. *New York.*
- Craig, W. J. ed. (2017). *Shakespeare: Complete Works.* Oxford University Press. UK.

Reference Book

- Williams,W. E .(2002). *A Book of English Essays.* Penguin Books. New Delhi.
- Nayar. (2011). *A Galaxy of English Essayists: From Bacon To Beerbohm.* Macmillan. New Delhi.
- Padmaja Ashok. (2011). *The Social History of England*. Orient Black Swan Private Ltd. Hyderabad.

E - Resources

- http://bunyanministries.org/books/pp_full_text.pdf.
- https://emed.folger.edu/sites/default/files/folger_encodings/pdf/EMED-Ed2-reg-3.pdf.

LITERARAY FORMS
UENA104

Semester : I **Credits : 4**
Category : Allied I **Hours/Week : 6**
Class &Major: I BA English **Total Hours : 78**

Objectives:
To enable the Students

- Understand Different Literary Terms.
- Expose the Learners to the most Common Elements of Literature.
- Examine Different Genres of Literature.

Learning Outcomes:
On Completion of the Course, the Students will be able to

- Make use of the Literary Techniques and Analyze it in the Poems.
- Acquire Proficiency to Classify Genre used by the Writer.
- Examine the different kinds of Narrative Experiments and the Common Literary Technique.

UNIT I POETRY **14 Hour**

What is Poetry? - The Lyric - The Sonnet - The Elegy - The Epic - The Ode - The Ballad.

UNIT II PROSE **16 Hour**

The Essay - The Short Story – Biography – Autobiography.

UNIT III DRAMA **16 Hour**

The Tragedy - The Comedy - Tragic-Comedy - The One-act play - The Absurd Drama Modern Drama, Miracle & Morality Plays - Chorus - Epilogue and Prologue.

UNIT IV NOVEL **16 Hour**

Novel - Novella -Historical Novel the Picaresque Novel - The Stream of consciousness Novel.

UNIT V LITERARY TERMS **16 Hour**

Allegory - Comic Relief - Dramatic Monologue - Farce - Euphemism - Expressionism - Satire –Plot – Melo- Drama - Irony - Soliloquy – Myth - Irony - Bildungsroman - Personification.

Text Books

- Abrams, M. H. (2014). *A Glossary of Literary Terms*. Macmillan Publishers.U.S.
- Ramachandran Nair, K. (2005). *Literary Forms*. Emerald. Chennai.

Reference Books

- Prasad, B.A. (2013). *Background to the Study of English Literature*. Macmillan India Limited. New Delhi.
- Childs Peter and Roger Fowler. (2006). *The Routledge Dictionary of Literary Terms*. Routledge. London.

ENGLISH FOR COMMUNICATION (STREAM – I)

UENL109

Semester	**: I**	**Credit**	**: 3**
Category	**: English**	**Hours/Week**	**: 5**
Class & Major	**: I UG**	**Total Hours**	**: 65**

Objectives:

To enable Students

- Enrich and Equip the Skills of the Students.
- Motivate the Students and Excel in Potential in LSRW Skills.

Learning Outcomes:

On Completion of the Course, the Student will be able to

- Understand the Context of the Communication.
- Familiarize to Speak Fluently in all Situation.

UNIT I LSRW-I **13 Hour**

Listening and Speaking- a. Introducing Self and Others, b. Listening for Specific Information, c. Pronunciation (without Phonetic Symbols)- i. Essentials of Pronunciation, ii. American and British Pronunciation.

Reading and Writing- a. Reading Short Articles – Newspaper Reports / Fact based Articles- i. Skimming and Scanning, ii. Diction and Tone, iii. Identifying Topic Sentences, b. Reading Aloud: Reading an Article/Report, c. Journal (Diary) Writing.

Study Skills - a. Using Dictionaries, Encyclopaedias, Thesaurus

Grammar in Context: Naming and Describing-Nouns & Pronouns, Adjectives.

UNIT II LSRW-II **13 Hour**

Listening and Speaking- a. Listening with a Purpose, b. Effective Listening, c. Tonal Variation,d. Listening for Information, e. Asking for Information, f. Giving Information.

Reading and Writing- 1.a. Strategies of Reading- Skimming and Scanning, b. Types of Reading - Extensive and Intensive Reading, c. Reading a Prose Passage, d. Reading a Poem, e. Reading a Short Story. 2. Paragraphs- Structure and Types a. What is a Paragraph? b. Paragraph Structure c. Topic Sentence d. Unity e. Coherence f. Connections between Ideas: Using Transitional Words and Expressions g. Types of Paragraphs.

Study Skills II-Using the Internet as a Resource-a. Online Search b. Know the keyword c. Refine your search d. Guidelines for using the Resources e. e-Learning resources of Government of India f. Terms to know.

Grammar in Context: Involving Action- I-a. Verb, b. Concord.

UNIT III LSRW-III **13 Hour**

Listening and Speaking- a. Giving and following instructions, b. Asking for and giving directions, c. Continuing discussions with connecting ideas.

Reading and Writing-a. Reading Feature articles (from newspapers and magazines), b. Reading to Identify point of view and Perspective (opinion pieces, editorials etc.), c. Descriptive writing – Writing a Short Descriptive Essay of two to three Paragraphs.

Grammar in Context: Involving Action- II- Verbals - Gerund, Participle, Infinitive- Modals.

UNIT IV LSRW-IV **13 Hour**

Listening and Speaking- a. Giving and Responding to Opinions,

Reading and Writing- a. Note Taking b. Narrative Writing – Writing Narrative Essays of two to three Paragraphs

Grammar in Context: Tense- Present - Past - Future

UNIT V LSRW-V **13 Hour**

Listening and Speaking- a. Participating in a Group Discussion

Reading and Writing- a. Reading Diagrammatic Information – Interpretations Maps, Graphs and Pie Charts, b. Writing Short Essays using the Language of Comparison and Contrast.

Grammar in Context: Voice (showing the relationship between Tense and Voice)

Text Book

- **Communicative English Semester- I** (for Students of Arts & Science Colleges) Tamil Nadu State Council of Higher Education (TANSCHE) 2020-2021.

ENGLISH FOR COMMUNICATION (STREAM – II)

UENL110

Semester	**: I**	**Credit**	**: 4**
Category	**: English**	**Hours/Week**	**: 5**
Class & Major	**: I UG**	**Total Hours**	**: 65**

Objectives:

To enable Students

- Enrich and Equip the Skills of the Students.
- Motivate the Students and Excel in Potential in LSRW Skills.

Learning Outcomes:

On Completion of the Course, the Student will be able to

- Understand the Context of the Communication.
- Familiarize to Speak Fluently in all Situations.
- Analyze the Context and Reply to it.

UNIT I LSRW-I **13 Hour**

Listening and Speaking- a. Introducing Self and others, b. Listening for Specific Information,c. Pronunciation (without phonetic symbols)- i. Essentials of Pronunciation, ii. American and British Pronunciation.

Reading and Writing- a. Reading Short Articles – Newspaper Reports / Fact based Articles- i. Skimming and Scanning, ii. Diction and Tone, iii. Identifying Topic Sentences, b. Reading Aloud: Reading an Article/Report,c. Journal (Diary) Writing.

Study Skills - a. Using Dictionaries, encyclopaedias, Thesaurus

Grammar in Context: Naming and Describing-Nouns & Pronouns, Adjectives.

PRACTICAL: Listening, Speaking, Reading, Writing

UNIT II LSRW-II **13 Hour**

Listening and Speaking- a. Listening with a Purpose, b. Effective Listening, c. Tonal Variation, d. Listening for Information, e. Asking for Information, f. Giving Information.

Reading and Writing- 1.a. Strategies of Reading- Skimming and Scanning, b. Types of Reading - Extensive and Intensive Reading, c. Reading a prose passage, d. Reading a poem, e. Reading a Short story. 2.Paragraphs- Structure and Types a. What is a Paragraph? b. Paragraph Structure c. Topic Sentence d. Unity e. Coherence f. Connections between Ideas: Using Transitional words and expressions g. Types of Paragraphs.

Study Skills II-Using the Internet as a Resource-a. Online search b. Know the keyword c. Refine your search d. Guidelines for using the Resources e. e-learning Resources of Government of India f. Terms to know.

Grammar in Context: Involving Action- -a. Verb, b. Concord.

PRACTICAL: Listening, Speaking, Reading, Writing

UNIT III LSRW-III **13 Hour**

Listening and Speaking- a. Giving and following Instructions, b. Asking for and giving directions, c. Continuing discussions with Connecting Ideas.

Reading and Writing-a. Reading feature Articles (from Newspapers and Magazines), b. Reading to Identify point of View and Perspective (Opinion Pieces, Editorials etc.), c. Descriptive Writing – Writing a Short Descriptive essay of two to three Paragraphs.

Grammar in Context: Involving Action- II- Verbals - Gerund, Participle, Infinitive- Modals.

PRACTICAL: Listening, Speaking, Reading, Writing

UNIT IV LSRW-IV **13Hour**

Listening and Speaking- a. Giving and responding to Opinions,

Reading and Writing- a. Note Taking b. Narrative Writing – Writing Narrative Essays of two to three Paragraphs

Grammar in Context: Tense- Present - Past - Future

PRACTICAL: Listening, Speaking, Reading, Writing

UNIT V LSRW-V **13 Hour**

Listening and Speaking- a. Participating in a Group Discussion

Reading and Writing- a. Reading Diagrammatic Information – Interpretations Maps, Graphs and Pie Charts, b. Writing Short essays using the Language of Comparison and Contrast.

Grammar in Context: Voice (showing the relationship between Tense and Voice)

PRACTICAL: Listening, Speaking, Reading, Writing

Text Book

- **Communicative English Semester- I** (for Students of Arts & Science Colleges) Tamil Nadu State Council of Higher Education (TANSCHE) 2020-2021.

PROFESSIONAL ENGLISH I
UPEM101

Semester	**: I**	**Credit**	**: 4**
Category	**: English Core**	**Hours/Week**	**: 6**
Class & Major	**: I UG**	**Total Hours**	**: 78**

Objectives:

To enable Students

- Develop the Language Skills of Students by offering Adequate Practice in Professional Contexts.
- Understand the Domain Specific Registers and the required Language Skills.

UNIT I COMMUNICATION **15 Hour**

Listening: Listening to Audio Text and answering Questions- Listening to Instructions
Speaking: Pair work and Small Group Work.
Reading: Comprehension Passages –Differentiate between Facts and Opinion
Writing: Developing a Story with Pictures**.**
Vocabulary: Register Specific - Incorporated into the LSRW Tasks

UNIT II DESCRIPTION **16 Hour**

Listening: Listening to Process Description - Drawing a Flow Chart.
Speaking: Role Play (Formal Context)
Reading: Skimming/Scanning- Reading Passages on Products, Equipment and Gadgets.
Writing: Process Description –Compare and Contrast Paragraph-Sentence Definition and Extended Definition- Free Writing.
Vocabulary: Register Specific -Incorporated into the LSRW Tasks.

UNIT III NEGOTIATION STRATEGIES **17 Hour**

Listening: Listening to Interviews of Specialists / Inventors in Fields (Subject Specific)
Speaking: Brainstorming. (Mind mapping). Small group discussions (Subject- Specific)
Reading: Longer Reading Text.
Writing: Essay Writing (250 words)
Vocabulary: Register Specific - Incorporated into the LSRW Tasks

UNIT IV PRESENTATION SKILLS **15 Hour**

Listening: Listening to Lectures.
Speaking: Short Talks.
Reading: Reading Comprehension Passages
Writing: Writing Recommendations Interpreting Visuals Inputs
Vocabulary: Register Specific - Incorporated into the LSRW Tasks

UNIT VCRITICAL THINKING SKILLS **15 Hour**

Listening: Listening Comprehension- Listening for Information.
Speaking: Making Presentations (with PPT- practice).
Reading: Comprehension Passages – Note Making. Comprehension: Motivational Article on Professional Competence, Professional Ethics and Life Skills)
Writing: Problem and Solution essay– Creative writing –Summary writing
Vocabulary: Register specific - Incorporated into the LSRW Tasks

Text Books

- Professional English For Physical Sciences/Life Sciences/Commerce And Management/ Arts & Social Sciences, 2020. Tamil Nadu State Council for Higher Education (TANSCHE).

Note:

- **Text Book has to be selected in the respective Discipline (Major).**

BRITISH LITERATURE II

UENM209

Semester : II	**Credits : 4**
Category : Core III	**Hours/Week : 6**
Class & Major : I B.A. English	**Total hours : 78**

Objectives:

To enable the Students

- Understand and Identify the Various Poetic Trends, Styles and Themes during the Romantic Age.
- Understand and Identify the Various Poetic Trends, Styles and Themes during the Victorian Age.
- Evaluate the Themes and Narrative Structure of Literary Fiction in terms of Setting, Character, Plot and Symbolism.

Learning Outcomes:

On Completion of the Course, the Students will be able to

- Understand the Characteristics and Themes of the Romantic Age and the Victorian Age.
- Appreciate the value of Simple Life.
- Analyse Individual Narrative, Poetic and Dramatic Texts.

UNIT I POETRY **13 Hour**

Percy Shelley	:	Ode to the West Wind
William Blake	:	The Lamb
Thomas Gray	:	Elegy Written in a Country Churchyard
Mathew Arnold	:	Dover Beach
Christina Rossetti	:	Remember

UNIT II PROSE **17 Hour**

A.G. Gardiner	:	In Defense of Ignorance
G. K. Chesterton	:	On Running after One's Hat

UNIT III SHORT STORY **17 Hour**

Charlotte Perkins Gilman	:	The Yellow Wallpaper
Virginia Woolf	:	The Duchess and the Jeweller

UNIT IV DRAMA **15 Hour**

G B Shaw	:	Pygmalion

UNIT V FICTION **16 Hour**

Emily Bronte	:	Wuthering Heights

Text Books

- Bronte, Emily. (2010). *Wuthering Heights.* Harper Press. Delhi.
- Rowse, A.L. (2011). *Mathew Arnold: Poet and Prophet*. Latmer Trend and Co, London.
- Nayar. (2011). *A Galaxy of English Essayists: From Bacon to Beerbohm,* Macmillan. New Delhi**.**
- Shaw George Bernard. (2013). *Act Five. Pygmalion*. Peacock Books. London.

Reference Books

- Adrian Hunter. (2007). *The Cambridge introduction to Short Story in English*. London. Cambridge U P. Print.
- Abrams, M. H. (2009). *Norton Anthology of English Literature*. London. Print.

E- Resource

- https://www.sparknotes.com/lit/pygmalion/
- https://www.gradesaver.com/pygmalion/e-text/sources
- https://www.cliffsnotes.com/literature/w/wuthering-heights/book-summary
- https://www.gradesaver.com/matthew-arnold-poems/study-guide/summary-dover-beach-1867.

AMERICAN LITERATURE

UENM210

Semester : II **Credits : 4**
Category : Core IV **Hours/week: 5**
Class & Major : I B.A English **Total Hours: 65**

Objectives:

To enable the Students

- Identify the Impression of American Literature on Society.
- Analyse Various Devices used by the American Writers.
- Criticize the Works of Great Writers and Thinkers of America.

Learning Outcomes:

On Completion of the Course, the Students will be able to

- Understand and Evaluate Poetry of American Writers.
- Understand about the Absurdity of War in Prose.
- Analyse the Class difference in the Drama and its impact on the society.
- Comprehend and evaluate the Short Stories in term of Plot, Character, Theme, Symbol and Setting.
- Understand about the Struggle for Life and Determination from the Novel.

UNIT I POETRY **12 Hour**

Carl Sandburg	:	Chicago
Walt Whitman	:	I Sit and Look Out
Emily Dickinson	:	Because I Could Not Stop for Death
Robert Frost	:	Stopping by Woods on a Snowy Evening
E.E.Cummings	:	The Cambridge Ladies

UNIT II PROSE **14 Hour**

Ralph Waldo Emerson	:	The American Scholar
Henry David Thoreau	:	Civil Disobedience

UNIT III SHORT STORIES **15Hour**

Edgar Allan Poe	:	The Cask of Amontillado
Washington Irving	:	The Legend of Sleepy Hollow

UNIT IV DRAMA **12 Hour**

Arthur Miller	:	All My Sons

UNIT V FICTION **12Hour**

Mark Twain	:	The Adventures of Tom Sawyer
Zora Neale Hurston	:	Their Eyes Were Watching God

Text Books

- Mark Twain. (2012). *The Adventures of Tom Sawyer. Harper. United States.*
- Zora Neale Hurston. (2011). *Their Eyes Were Watching God. Albama. United States.*
- Arthur Miller. (2010). *All My Sons.* Reynal & Hitchcock. New York City.

Reference Books

- William Fisher, J. ed. (2012). *American Literature of the Nineteenth Century: An Anthology*. Eurasia Publishing House. New Delhi.
- Egbert Oliver. ed .(2009). *American Literature 1890-1965: An Anthology.* S. Chand & Co Ltd, New Delhi.
- George Perkins & Barbara Perkins. (2011). *The American Tradition in Literature*. Penguin Publishing House. New Delhi.

E-Resources

- https://www.slideshare.net//americansanrachna/film-marketing-present-senario
- https://www.cliffsnotes.com//literature//w//book-summary

WOMEN IN LITERATURE
UENA204

Semester	**: II**	**Credits**	**: 4**
Category	**: Allied -II**	**Hours/Week**	**: 6**
Class &Major	**: I BA English**	**Total Hours**	**: 78**

Objectives:
To enable the Students

- Identify key Questions, Authors, and Literary Forms in Women in Literature.
- Analyze the Text in relation to Women in Literature.
- Critically Evaluate Arguments and Assumptions about Women in Literature, Texts, and mode of Interpretation.

Learning Outcomes:
On completion of the Course, the Student will be able to

- Understand the Multiple aspects in Women in Literature
- Analyze the Text in Feminism Theory with Literature Context and use the Theory in Research.
- Develop the Interpretative Skill through Close Reading.

UNIT I POETRY **15 Hour**

Adrienne Rich	:	Snapshots of a Daughter- in-Law
Sylvia Plath	:	Daddy
Kamala Das	:	An Introduction
Margaret Atwood	:	Siren Song
Maya Angelou	:	Phenomenal Woman

UNIT II PROSE **15 Hour**

Virginia Woolf	:	A Room of One's Own (Chapter 3)
Dale Spender	:	Women and Literary History

UNIT IV SHORT STORIES **15 Hour**

Charlotte Perkins Gilman	:	The Yellow Wallpaper
Joyce Carol Oates	:	Where are you Going, Where have you been?

UNIT III DRAMA **15 Hour**

Lorraine Hansberry	:	A Raisin in the Sun

UNIT V NOVEL **18 Hour**

Toni Morrison	:	Beloved
Anita Desai	:	Fasting, Feasting

Text Books

- Cynthia Zimmerman. (2008). *Sharon Pollock: Collected Works: II*. Canada Press. Vancouver.
- Catherine Belsey and Jane Moore. (2000). *The Feminist Reader: Essays in Gender and the Politics of Literary Criticism*. Blackwell. London.
- Charlotte Bronte. (2006). *Jane Eyre*. Peacock Books. Delhi.
- Toni Morrison. (2005). *Beloved*. Vintage. London.
- Anita Desai. (2011). *Fasting, Feasting*. Chatto & Windus. Delhi.

Reference Books

- Adair. ed (2010). *Faber Book of 20th Century Women's Poetry*. St. Paul's Publications. Allahabad.
- Rashmi Gaur. (2003). *Women's Writing.* Sarut and Sons. New Delhi.

E-Resources

- https://docs.lib.purdue.edu › cgi viewcontent
- https://mesacountylibraries.org › 2015/10 › banned-bo.

FILM STUDIES

UENE203

Semester	**: II**	**Credits**	**: 2**
Category	**: NME**	**Hours/Week**	**: 3**
Class &Major	**: I B.A English**	**Total Hours**	**: 39**

Objectives:

To enable the Students

- Understand the Film History and Development in World and India.
- Analyze the Various Genres of Films and Film Appreciation.
- Comprehend the Fundamentals of Film Production.

Learning Outcome:

On Completion of the Course, the Students will be able to

- Observe with Knowledge and reflect upon the Articulation of a Film's Content, Form and Structure.
- Identify and Define the Formal and Stylistic Elements of Film.
- Develop an Understanding of film Language and Terminology, and Analyze the ways in which that this Language constructs Meaning and Ideology.

UNIT I INTRODUCTION **8 Hour**

History of Cinema in India- Major landmarks in Indian Cinema

UNIT II GENERS OF FILM **8 Hour**

Kinds of Films - Historical- Patriotic- Documentary- Thrillers etc**.**

UNIT III TECHNIQUES OF FILM MAKING **7 Hour**

Art of Film Making- Some Important Technique - Acting- photography- Direction- Scriptwriting etc.

UNIT IV SOCIAL RESPONSIBILITIES OF FILM **8 Hour**

Films and Entertainment - Films and Social Responsibility

UNIT V PRACTICAL **8 Hour**

Review of Films & Documentary Film.

Text Books

- Geoffrey Nowell Smith. (2018). *The History of Cinema: A Short Introduction*. Oxford UP. Chennai.

Reference Books

- Nelmes Jill. (2021). *Introduction to Film's Studies*. Routledge,.(5th Ed.). New York.
- Steven Ascher. (2019). *The Filmmaker's Handbook: A Comprehensive Guide for the Digital Age*. Plume. New York.
- Renu Saran. (2014). *History of Indian Cinema*. Diamond Publishers. New Delhi.
- Micheal Rabinger & Mick Cherrien. (2013). *Directing: Film Techniques & Aesthetics*. Focal Press. Burlington.

E-Resources

- https://www.academic info.net/film.html.
- https://www.slideshare.net/sanrachna/film-marketing-present-senario

PUBLIC SPEAKING
UENE204

Semester	**: II**	**Credits**	**: 2**
Category	**: NME**	**Hours/Week**	**: 3**
Classs& Major	**: I BA English**	**Total Hours**	**:39**

Objectives:

To enable the Students

- Think Clearly, Critically and creatively to express themselves effectively through Oral Communication.
- Understand the Salient Features of Speaking in Public and Discussing in Groups.
- Practice and Achieve Developed Skills in Speech and Excel in Group Interaction.

Learning Outcomes:

On Completion of the Course, the Student will be able to

- Understand the Goals and Benefits of Public Speaking
- Identify Strategies to prepare and deliver an Informative Speech
- Identify key Principles of Ethical Communication
- Explain how to use Audience Analysis Before, During, and After the Speech.

UNIT I PUBLIC SPEAKING: FOREGROUNDING **8 Hour**

Theory of Oral Communication
Leadership Traits and Communication
Discovery of Self Confidence and Motivation
Voice Culture exercises
Voice Formation / Modulation

UNIT II PRESENTATION **8 Hour**

Reading Background Information
Writing a Draft
Keeping Documentation
Organising Methods

UNIT III PRACTICE OF DIFFERENT KIND OF SPEECHES **7 Hour**

Welcome Address
Vote of Thanks
Topical Address
Extempore Speech
Seminar Presentation

UNIT IV GROUP DISSCUSION: GROUP CRITERIA **8 Hour**

Group Cohesiveness
Enthusiasm / Dynamism
Disagreeing Without being Disagreeable
Building up on each other's ideas
Generation of New Ideas

UNIT V GROUP DISCUSSION: INDIVIDUAL CRITERIA **8Hour**

Participation and Content
Questions Providing Stimuli for Discussion
Active Listening
Taking the Initiative
Paraphrasing others' Ideas

Text Books

- Tony Buzan. (2002). *The Power of Verbal Intelligence*. Haper Collins. London.
- Arindam Chaudhuri. *(*2001).*Count Your Chickens Before They Hatch*. Vikas Publishing House. New Delhi.

Reference Books

- Gulati Sarvesh. (2006). *Corporate Soft Skills*. Rupa & Co. New Delhi.
- Heller Robert. (2001). *Communicate Clearly*. DK Books. London.
- George Kaitholil (2005). *You Can Be An Effective Speaker*. Penguins. Mumbai.

E-Resource

- https://in.topresume.com/career-advice/15-free-resources-to-improve-your-presentation-and-speaking-skills
- https://www.mastersincommunication.com/public-speaking/
- https://www.inc.com/larry-kim/nine-places-to-learn-public-speaking-for-free.html
- https://www.quora.com/What-are-the-best-and-free-online-resources-to-learn-public-speaking
- https://www.wisesayings.com/public-speaking-an-online-resource-guide.php

BUSINESS WRITING
UENE202

Semester	**: II**	**Credits**	**: 2**
Category	**: NME**	**Hours/Week**	**: 3**
Class& Major	**: I BA English**	**Total Hours**	**: 39**

Objectives:

To enable the Students

- Understand the nuances of Business Writing.
- Develop the writing skills of the Students.
- Master the art of written Communication through Presentation.

Learning Outcomes:

On Completion of the Course, the Student will be able to

- Understand the Business Writing Skills.
- Identify Strategies to Write Business Letters.
- Develop a Suitable Business Writing Skills.

UNIT I INTRODUCTION TO BUSINESS WRITING **8 Hour**

Layout Guide-e-mails and Letters- Dictionary Skills

UNIT II STYLES IN WRITING **7 Hour**

Steps in Writing - Choice of Words - Checking Spelling and Grammar -Writing a plan

UNIT III NEWS REPORTING **8 Hour**

Referring and giving news - Steps to prepare an appropriate Reply

UNIT IV MECHANICS OF WRITING **8 Hour**

Understanding the sources - Preparing Hints – Drafting Mechanics of Writing

UNIT V WRITING RESPONSE **8 Hour**

Framing a Reply - Final Steps - Checking Reply - Polishing and Improving

Text Books

- Kapoor, A.N. (2009). *Business Letters for Different Occasions*. S. Chand & Company Ltd. New Delhi.

Reference Books

- Prabhu, K.M. (2008). *Advanced Business Writing.* New Book House. Chennai.

PROFESSIONAL ENGLISH II
UPEM201

Semester	**: II**	**Credit**	**: 4**
Category	**: English Core**	**Hours/Week**	**: 6**
Class & Major	**: I UG**	**Total Hours**	**: 78**

Objectives:
To enable Students

- Develop their Competence in the use of English with Particular Reference to the Workplace Situation.
- Enhance the Creativity of the students, which will enable them to think of Innovative ways to Solve Issues in the Workplace.

UNIT I COMMUNICATIVE COMPETENCE **15 Hour**

Listening: Listening to two Talks/Lectures by Specialists on selected Subject Specific Topics -(TED Talks) and answering Comprehension Exercises (Inferential Questions)
Speaking: Small Group Discussions (the discussions could be based on the Listening and Reading Passages- Open ended Questions
Reading:Two subject-based reading texts followed by Comprehension Activities/Exercises
Writing: Summary Writing based on the Reading Passages.
Grammar and vocabulary Exercises/Tasks to be designed based on the Discourse Patterns of the Listening and Reading Texts in the Book. This is applicable for all the Units.

UNIT II PERSUASIVE COMMUNICATION **6 Hour**

Listening: Listening to a Product Launch- Sensitizing Learners to the nuances of Persuasive Communication
Speaking: Debates – Just-A Minute Activities
Reading: Reading Texts on Advertisements (on products relevant to the Subject Areas) and answering Inferential Questions
Writing: Dialogue Writing- Writing an Argumentative /Persuasive Essay.

UNIT- III DIGITAL COMPETENCE **17 Hour**

Listening: Listening to Interviews (Subject related)
Speaking: Interviews with Subject Specialists (usingvideo conferencing skills) Creating Vlogs (How to become a vlogger and use vlogging to nurture Interests – Subject related)
Reading: Selected Sample of Web Page (subject area)
Writing: Creating Web Pages
Reading Comprehension: Essay on Digital Competence for Academic and Professional Life. The essay will address all aspects of Digital Competence in relation to MS Office and how they can be utilized in relation to work in the Subject area

UNIT- IV CREATIVITY AND IMAGINATION **15 Hour**

Listening: Listening to Short (2 to 5 minutes) Academic Videos (prepared by EMRC/ other MOOC Videos on Indian Academic Sites
Speaking: Making Oral Presentations through Short Films – Subject based
Reading: Essay on Creativity and Imagination (Subject based)
Writing: Basic Script Writing for Short Films (subject based) - Creating Web Pages, Blogs, Flyers and Brochures (subject based)- Poster Making – Writing Slogans/Captions (subject based)

UNIT- V WORKPLACE COMMUNICATION& BASICS OF ACADEMIC WRITING 15 Hour
Speaking: Short Academic Presentation using PowerPoint
Reading & Writing: Product Profiles, Circulars, Minutes of Meeting. Writing an introduction, Paraphrasing

Text Books

- Professional English for PHYSICAL SCIENCES/LIFE SCIENCES/COMMERCE AND MANAGEMENT/ ARTS & SOCIAL SCIENCES, 2020. Tamil Nadu State Council for Higher Education (TANSCHE).

Note:

- **Text Book has to be selected in the respective Discipline (Major).**

III AND IV EVALUATION AND COMPONENTS OF CIA

Semester	Category	Course Code	Course Title	Component III	Component IV
I	English/ AECC-I	UENL109	English for Communication (Stream - I)/	Assignment	Poster Presentation
		UENL110	English for Communication (Stream- II)	Practical	Practical
	Major Core I/ DSC	UENM110	Indian Writing in English	Seminar	Assignment
	Major Core II/ DSC	UENM111	British Literature- I	Assignment	Seminar
	Allied(GE)I	UENA104	Literary Forms	Assignment	Poster Presentation
	PE	UPEM101	Professional English –I	Assignment	Seminar
II	English/ AECC-I	UENL209	English for Communication (Stream –I)/	Assignment	Seminar
		UENL210	English for Communication (Stream- II)	Practical	Practical
	Major Core III/ DSC	UENM209	British Literature- II	Assignment	Seminar
	Major Core IV/ DSC	UENM210	American Literature	Assignment	Poster Presentation
	Allied(GE) II	UENA211	Women in Literature	Role Play	Album Making
	PE	UPEM201	Professional English –II	Conversation	Poster Presentation
	SEC/NME	UENE202	Business Writing	Paper Presentation	Seminar
		UENE203	Film Studies	Poster Presentation	Review Presentation
		UENM204	Public Speaking	Debate	Oration

PROGRAMME PROFILE: M.A. ENGLISH

Programme Specific Outcomes (PSO)
Upon Completion of the Programme, the Students will be able to

PSO 1: Critically Appreciate the Different Literature and its Values since 16th century to 21st Century.
PSO 2: Interpret the Classical Literary Text and its Rich Translation.
PSO 3: Use the Strategies of Textual Interpretation Appropriate to Different Literary Genres.
PSO 4: Develop Pronunciation Skills through Phonetics and Linguistics terms.
PSO 5: Defend Equalities in the Feminist Literary Writings and its Values.

Semester	Category	Course Code	Course Title	Previous Course Code	Contact Hours/ Week	Credit Min/Max
I	Major Core I/ DSC	PENM118	British Literature – I	-	6	4
	Major Core II/ DSC	PENM119	American Literature	PENM114	6	4
	Major Core III/ DSC	PENM120	Advanced English Grammar	-	6	4
	Major Core IV/ DSC	PENM121	Literary Criticism	-	6	4
	Major Core V/ DSC	PENM122	Human Rights and Subaltern Literature	-	6	4
				TOTAL	**30**	**20**
II	Major Core VI / DSC	PENM218	British Literature – II	-	5	4
	Major Core VII/ DSC	PENM219	Literatures in Translation	PENM312, PENM403	5	4
	Major CoreVIII/ DSC	PENM220	Women and Literature	-	5	4
	Major Core IX/ DSC	PENM221	Principles and Methods of ELT	-	5	4
	Major Core X/ DSC	PENM222	Applied Linguistics	-	5	4
	Online Course	PONL201	Online Course		-	-/2
	Non-Major Elective/ SEC	PENE203	Academic Writing	-	5	4
	Service Learning				-	1
				TOTAL	**30**	**25/27**
III	Major Core XI/ DSC	PENM316	Postcolonial Literature	PENM409, PENM217	6	4
	Major Core XII/ DSC	PENM317	Feminist Theories	-	6	4
	Major Core XIII/ DSC	PENM318	Ecology and Literature	-	6	4

	Major Core XIV/ Interdisciplinary/ GE	PENI302	Translation Studies	-	5	4
	Major Core XV/ AECC	PRMC301	Research Methodology	PENM311	5	4
	Major Core XXI/ DSC	PENP401	Project	-	2	-
				TOTAL	**30**	**20**
IV	Major Core XVI/ DSC	PENM415	Literary Theory and Practice	-	5	4
	Major Core XVII/ DSC	PENM416	Shakespearean Studies	-	5	4
	Major Core XVIII/ DSC	PENM417	North- East Literature	-	5	4
	Major Core XIX / DSC	PENM418	Women Nobel and Booker Prize Winners	-	5	4
	Major Core XX/ DSC	PENM419	Cultural Studies	-	6	4
	Major Core XXI/ DSC	PENP401	Project		4	5
				TOTAL	**30**	**25**
				GRAND TOTAL	**90**	**90/92**

NON MAJOR ELECTIVES

Semester	Part	Category	Course Code	Course Title	Contact/Week	Credit
II	IV	Non Major Core/ SEC	PENE202	Copy Editing	5	4
		Non Major Core/ SEC	PENE203	Academic Writing		

EXTRA CREDIT EARNING PROVISION

Semester	Part	Category	Course Code	Course Title	Contact/Week	Credit
II	III	Core	PENS201	NPTEL	3	2
II	III	Core	PENS202	Spoken Tutorial	3	1

SELF- STUDY (EXTRA CREDIT EARNING PROVISION)

Semester	Part	Category	Course Code	Course Title	Contact/Week	Credit Min/Max
III	III	Core	PENS301	Book Review	-	1

BRITISH LITERATURE- I
PENM118

Semester :I **Credits :4**
Category : Core I **Hours/ Week :6**
Class & Major : I MA ENGLISH **Total Hours :78**

Objectives:
To enable the Students

- Understand the Forms and Styles of Poetry, Explore Poetic Language, Analyse the Figures of Speech.
- Understand the Types and Characteristic Features of British Prose.
- Comprehend the Plot, Characterization, and Themes & Techniques of Drama.

Learning Outcomes:
On Completion of the Course, the Students will be able to

- Understand the Purpose of Chaucer's Writing and Analyse the Portraits he painted through his Description.
- Appreciate the Aphoristic Style and Comprehend the Ideas present in Restoration Age Prose.
- Critically analyze the Text and Interpret.

UNIT I (POETRY) THE AGE OF CHAUCER **15 Hour**
Detailed:

Geoffery Chaucer – Prolouge to the Canterbury Tales (The Knight's Tale, The Miller's tale, The Reeve's Tale, The Wife of Bath's Tale, The Clerk's Tale, The Franklin's Tale, The Prioress' Tale, The Nun's Priest's Tale, The Monk's Tale, The Parson Tale)
Non Detailed: William Langland – The Vision of William Concerning Piers the Plowman.

UNIT II (PROSE) THE RESTORATION AGE **15 Hour**

Jonathan Swift- The Battle of the Book Samuel Johnson – Life of Milton

UNIT-III (DRAMA) THE ELIZABETHAN AGE **17 Hour**

Christopher Marlowe – Tamburline the Great. Shakespeare – The Midsummer's Dream.

UNIT-IV (FICTION) THE NEO CLASSICAL AGE **15 Hour**

Daniel Defoe - Robinson Crusoe Jonathan Swift-Guliver's Travel (Voyage to Lilliput and Brobdingnag)

UNIT- V SEMINAR **16 Hour**

Epithalamion - Edmund Spenser William Shakespeare - Sonnets 1to 15. Thomas More – Utopia Addison and Steele - Sir Roger at Church, Sir Roger de Coverley- Portrait Gallery
John Webster – The Duchess of Malfi Oliver Goldsmith – She Stoops to Conquer.

Text Books

- Neville Coghill. (2003).Ed. *The Canterbury Tales*. Penguin Books. New Delhi.
- Marjorie Boulton. (2014). *The Anatomy of the Novel.* OUP. London.

Reference Books

- David Lane. (2010)**.** *Contemporary British Drama*. Edinburgh UP. Edinburgh.
- James,Henry. (2018). *The Art of Fiction.* Macmillan. New York.
- Lewin,Gerald, (2003). *Prose Models*. Harcourt Brace Jovanovich inc. US.

E-Resources

- https://www.gradesaver.com/new-atlantis
- https://www.sparknotes.com/lit/a-tale-of-two-cities/
- https://www.sparknotes.com/lit/tomjones/summary/
- https://www.sparknotes.com/lit/remains/summary/
- https://study.com/academy/lesson/the-changeling-by-thomas-middleton summary-themes.html

AMERICAN LITERATURE

PENM119

Semester : I **Credits : 4**
Category : Core II **Hours/Week: 6**
Class &Major: I MA English **Total Hours: 78**

Objectives:

To enable the Students

- Identify the Diction and Phraseology of American Writings.
- Employ the Themes and Techniques in their Projects.
- Develop an Awareness of the American thirst for Freedom.

Learning Outcomes:

On Completion of the Course, the Students will be able to

- Understand the History of American Literature and its Literary Techniques
- Appreciate the American Culture and Comprehend the Ideas Present in its Writings.
- Critically analyze the Prescribed Fiction.

UNIT I POETRY **16 Hour**

Emily Dickinson	:	I Tasted Liquor Never Brewed, Success is Counted Sweetest
Robert Frost	:	Mending Wall, After Apple Picking
Sylvia Plath	:	Daddy
Langston Hughes	:	The Negro speaks of River out of work
Allen Ginsberg	:	Howl

UNIT II PROSE **16 Hour**

R.W. Emerson	:	The American Scholar
William Faulkner	:	Nobel Prize Acceptance Speech.
Henry David Thoreau	:	"Where I Lived and What I Lived For?"From Walden Pond

UNIT III SHORT STORY **15 Hour**

Pearl S. Buck	:	The Quarrel

Mark Twain	:	The Ghost Story
Shirley Jackson	:	The Lottery

UNIT IV DRAMA **15 Hour**

Eugene O'Neill	:	Emperor Jones
Arthur Asher Miller	:	The Death of a Salesman

UNIT V FICTION **16 Hour**

Ernest Hemingway	:	For Whom the Bell Tolls
Alice Walker	:	Color Purple

Text Book

- McMichael George L and Frederick C. Crews. (2000). *Concise. Anthology of American Literature.* Macmillan. New York.

Reference Books

- Timothy Hilton.(2008).*The Praraphelites,* Macmillan India Ltd, New Delhi,
- Richard Russo. (2010). *The Best American Short Stories,* Hiedi Pietler, New York.
- *O'Neill Eugene.*(2017). *The Emperor Jones.* Lakshmi Narain Agarwal. India.

ADVANCED ENGLISH GRAMMAR

PENM120

Semester : I **Credits : 4**
Category : Core III **Hours/Week: 6**
Class &Major: I MA English **Total Hours: 78**

Objectives:

To enable the Students

- Acquire a high Proficiency in the use of English.
- Know the Dynamic and Analytical aspects of the Use of Language.
- Write English without Grammatical Errors.

Learning Outcomes:

On Completion of the Course, the Students will be able to

- Understand the Basic Structure of Grammar.
- Experiment with new Kinds of Writing.
- Write error Free Language.

UNIT I WORDS AND PHRASES **16 Hour**

WORDS: Nouns- Pronouns- Adjectives- Determiners - Verbs-Adverbs-Preposition - Conjunctions-Interjections.

PHRASES: Noun Phrases-Verb Phrase-Adjective Phrases-Adverb Phrases – Preposition Phrases

WORD FORMATION: Acronyms - Analogy- Back formation – Bending –Borrowing – Clipping- Coining – Compounding –Reduplication – Prefixes and Suffixes

UNIT II SENTENCE AND CLAUSES **16 Hour**

THE SENTENCE: Major and Minor Sentences – Simple and Multiple sentences and Clauses- Sentence Types – Positive and Negative Sentences- Active and Passive sentences.

SENTENCE AND CLAUSE : Clause elements – Subject Predicate – Verb Object Complement – Adverbial – Compound and Complex sentences – Independent and Dependent Clauses- Coordination – Subordination – Subordinate Clauses – Nominal or noun clause –Adverbial Clauses – Relative clauses – Comparative clauses –Finite and non finite clauses – Restrictive and non restrictive Clauses – Dangling modifiers – Readability.

UNIT III PUNCTUATION **15 Hour**

Apostrophe - Brackets - Capital Letters - Colon - Comma – Dash – Ellipsis – Exclamation mark - Full Stop - Hyphen-Paragraph - Question mark – Quotation marks – Semicolon – Slash.

UNIT IV FIGURES OF SPEECH AND LITERARY DEVICES **15 Hour**

Allegory – Alliteration – Anacoluthon – Analogy – Anticlimax – Antithesis – Assonance – Bathos – Catch Phrases – Clerihew – Cliché – Colloquialism – Dead Metaphor – Doubles – Epigram – Euphemism – Haiku – Hyperbole – Idiom – Innuendo – Irony – Limerick – Litotes – Malapropism – Meiosis – Metaphor – Metonymy – Metre – Onomatopoeia – Oxymoron – Palindrome – Paradox –Personification – Proverb – Pun – Rhetoric question –Simile – Spoonerism – Syllepsis– Synecdoche – Zeugma.

UNIT V COMMON ERRORS AND LITERARY DEVICES **16 Hour**

PRACTICAL: Exercises for Practice

Text Books

- Raymond Murphy. (2019). *English Grammar in Use: A Self-Study Reference and Practice Book for Intermediate Learners of English.*4th Edition. Cambridge University Press. UK.
- Jarvie Gordon. (2007). *Bloomsbury Grammar Guide.* 2nd Edition. Bloomsbury. New Delhi.

Reference Books

- Eastwood John. (2003). *Oxford Guide to English Grammar*. OPU. India.
- T.J Fitikides.(2010). *Common Mistakes in English.* Orient Longman. Mumbai.
- Leech Geoffrey Deucher Margret and Robert Hoogenrad. (2011). *English Grammar for Today.* Palgrave Macmillan. New York.
- Palmer, Richard. (2005).*The Good Grammar Guide*. Routledge. London.

LITERARY CRITICISM
PENM121

Semester : I	**Credits : 4**
Category : Core IV	**Hours/Week : 6**
Class &Major : I MA English	**Total Hours : 78**

Objectives:

To enable the Students

- Understand the Features in Literary Criticism.
- Differentiate the Various Methods and Technique used by the Critics.
- Analyze the Various Literary Pieces and Evaluate Critically.

Learning Outcomes:

On Completion of the Course, the Students will be able to

- Evaluate the Literary Work based on Different Approaches.
- Experiment with new Perspectives to Analyse the Literature.
- Approach the Text Critical View.

UNIT I FORMALISM & STRUCTURALISM **16 Hour**

W K Wimsatt and Munroe C. Beardsley : The Intentional Fallacy.

Jacques Derrida : Structure, Sign and Play in the Discourse of the Human Science

UNIT II MARXISM & FEMINISM **16 Hour**

Louis Althusser : Ideology and Ideological State Apparatuses

Elaine Showlater : Feminist Criticism in the Wilderness

UNIT III PSYCHOANALYSIS & MODERNISM **15 Hour**

Lionel Trilling : Freud and Literature

Michel Foucault : What is an Author?

UNIT IV POST-COLONIALISM & CULTURAL STUDIES **15 Hour**

Edward Said : Crisis [in Orientalism]

Stuart Hall : Cultural Studies and its Theoretical Legacies

UNIT V ECO CRITICISM & POSTMODERNISM **16 Hour**

Cheryll Glotfelty & Harold Fromm : *The Ecocriticism Reader: Landmarks in* Literary Ecology

Jean Baudrillard : Simulacra and Simulation

Text Books

- Abrams, M. H. (2014). *A Glossary of Literary Terms*. Harcourt Asia Pvt. Ltd. Singapore.
- Harry Blamires. (2001). *A History of Literary Criticism*. Macmillan. Delhi.
- Malik, R.S. &Jagdish, Batra. (2014) *A New Approach to Literary Theory & Criticism*. Atlantic Publishers, New Delhi.

Reference Books

- Peter Barry. (2002). *Beginning Theory*. Manchester UP. Manchester.
- David Daiches. (2001). *Critical Approaches to Literature*. Orient Longman. (2nd ed.,) Hyderabad.
- Habib M.A.R. (2005). *A History of Literary Criticism: From Plato to the Present*. Blackwell. Oxford.

E-Resources

- https://www.pdfdrive.com/literary-criticism-and-theories-e48887076.html
- http://elibrary.bsu.az/books_400/N_92.pdf
- https://core.ac.uk/download/pdf/129586403.pdf

HUMAN RIGHTS AND SUBALTERN LITERATURE

PENM122

Semester : I	**Credits : 4**
Category : Core V	**Hours/Week : 6**
Class &Major: I MA English	**Total Hours : 78**

Objectives:

To enable the Students

- Understand the issues of Oppression and the Role of Literature in the Cause.
- Create Awareness among the Learners on Human Rights.
- Expose different problems in Subaltern Literature..

Learning Outcomes:

On Completion of the Course, the Students will be able to

- Understand and Follow 'Rights Based Approach'.
- Understand the Hardship of Subaltern People.
- Analyse Subaltern life Style and their Identity Crisis.

UNIT I INTRODUCTION **16 Hour**

Human Rights

Development of the Concept of HR in History – Historical Documents dealing with Human Rights Need for Human Rights – The concepts such as Justice, Equality, and Liberty – Three Generation Rights and Classification of Rights – University and Indivisibility of Human Rights.

Subaltern Literature

Dalit Voices- African-American Voices- Women's Voices - Partition Literature.

UNIT II PROSE **16 Hour**

Dr.Ambedkar	:	Anhilation of Caste
Pratima Pardeshi	:	Ambedkar and Women's Liberation
Ranajit Guha	:	Subaltern studies Volumes

Gayathri : Can the Subaltern Speak?

UNIT III POETRY **15 Hour**

Yendluri Sudhakar : An Autobiography
L.S.Rokade : To Be or Not to be Born
Waman Nimbalkar : Mother
Namdeo Dhasal : Ode to Dr. Ambedhkar

UNIT IV DRAMA **15 Hour**

Bama : Karukku
Bandhumadhav : Poisoned Bread
Kushwant Singh's : Train to Pakistan

UNIT V FICTION **16 Hour**

Mahasweta Devi : Mother of 1084
Sivagai : The Grip of Change
Thakazhi Sivasankaran Pillai : Scavenger's Son
Imayam : Beasts of Burden

Text Books

- Aberjhani and Sandra L .West. (2003). *Encyclopedia of the Harlem Renaissance.* Factson File. NewYork.
- Ambedkar. (2014) *Annihilation of Caste*. Soft Group. India.

Reference Books

- David Arnold, and David Hardiman, eds. (1994).*Subaltern Studies VIII: Essays in Honour of Ranajit Guha*. Oxford University Press India. New Delhi.
- Arjun Dangle. ed. (1994). *Poisoned Bread*. Orient Longman. Hyderabad.
- Ranajit Guha, and Gayatri Chakravorty Spivak, eds .(1988). *Selected Subaltern Studies.* Oxford University. London.
- Rita Kothari. (2018).*Unbordered Memories*. Penguin Random House India Private Limited. London.

BRITISH LITERATURE II

PENM218

Semester :II **Credits : 4**
Category : Core VI **Hours : 5**
Class &Major :I MA ENGLISH **Total Hours : 65**

Objectives:

To enable the Students

- Understand the Forms and Styles of Poetry, Explore Poetic Language, Analyse the Figures of Speech.
- Understand the Types and Characteristic Features of British Prose.
- Recognize the Inevitable Outcome of the Novel.

Learning outcomes:

On the Completion of the Course, Students will be able to

- Identify and Define the Basic Terms and Concepts which are needed for Advanced Courses in British Literature.
- Write a Brief Essay describing the Distinct Features of the Important works of Mainstream Writers from Enlightment Age and Twentieth Century.
- Analyze and Interpret Seminal Poetry of the Period with Close Reading.

UNIT I (POETRY) ENLIGHTENMENT AGE & ROMANTIC AGE **12 Hour**

Pope	:	Rape of the Lock
Gray	:	Elegy Written in the country Churchyard
Tennyson	:	The Lotos- Eaters
Rosetti	:	The Blessed Damozel

UNIT II (PROSE) **10 Hour**

Swift	:	The Battle of the Books
Charles lamb	:	A Dissertation upon Roast Pig

UNIT III (SHORT STORY) THE VICTORIAN AGE **10 Hour**

Oscar Wilde	:	The Devoted Friend
Katrine Masfield	:	The Garden Party

UNIT IV (DRAMA) THE MODERN AGE **16 Hour**

Congreve	:	The Way of the World
Goldsmith	:	She Stoops to Conquer

UNIT V (FICTION) THE POST MODERN AGE **17 Hour**

Virginia Woolf	:	To the Light House
John Fowles	:	The French Lieutenant's Woman

Text Books

- Stevie Davies. (2012)**.** *Virginia Woolf To the Lighthouse.* Penguin Books. New York.
- John Fowles. (2004)*.The French Lieutenant's Woman.* Vintage Classics.
- Kathleen Lynch, M. ed.(2006).Congreve *The Way of the World*. Great Britain: University of Nebraska Press.

- Oliver Goldsmith. (2012). *She Stoops to Conquer*. Surjeet Publications. New Delhi.

Reference Books

- Abrams. M.H.(2012). *Norton Anthology of English Literature*, Ninth Edition, W.W. Norton and Company. London.
- Margaret Ferguson, Mary Jo Salter and Jon Stallworthy**.** (2005). *The Norton Anthology of Poetry*. W. W. Norton & Company.USA.

E-Resource

- http://egyankosh.ac.in/bitstream/123456789/26891/1/Unit-24.pdf
- https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwi_1L6d2IbvAhUv7HMBHWADA0sQFjADegQICRAD&url=http%3A%2F%2Fegyankosh.ac.in%2Fbitstream%2F123456789%2F26891%2F1%2FUnit-24.pdf&usg=AOvVaw3PoP5khoFFt1abvZbiP6Ng

LITERATURE IN TRANSLATION

PENM219

Semester	**: II**	**Credits**	**: 4**
Category	**: Core VII**	**Hours**	**: 5**
Class & Major	**: I MA ENGLISH**	**Total Hours**	**: 65**

Objectives:

To enable the Students

- Understand the Great Epics in Literature Through Translation.
- Familiarise with the Select Non-English Classics in Dramatic Literature.
- Appreciate the Narrative Style and Aware of Various aspects of Life and Living through the Writings of the Great Writers.

Learning Outcomes:

On Completion of the Course, the Students will be able to

- Understand the Richness of other Cultures.
- Evaluate the Reflections of Tradition in Translated Works.
- Analyse the Theme of Translated Works and Experience the Art of Translation

UNIT I POETRY **10 Hour**

Homer	:	The Iliad
Lakdasa Wikkramasinha	:	Don't Talk to me About Matisse
Rabindranath Tagore	:	Hard Times

UNIT II PROSE **13 Hour**

Lafcadio Hearn	:	Mosquitoes
Longinus	:	On the Sublime

UNIT III DRAMA **15 Hour**

Abhi Subedi	:	Fire in the Monastery
Henrik Ibsen	:	A Doll's House

UNIT IV SHORT STORY **15 Hour**

Uday Prakas	:	The Walls of Delhi
Ashoke Mukhopadhyay	:	A Ballad of Remittent Fever

UNIT V FICTION & CREATIVE WRITING **12 Hour**

Perumal Murugan	:	One Part Women
TRANSLATION PRACTICE vice versa English to Tamil	:	Translating Proverbs, Poetry and Prose from and

Text Books

- Homer. (2003) The *Iliad*. tr. E.V. Rieu (Harmondsworth: Penguin Classics, London.
- Henrik Ibsen. (2016) *The Doll's House.* Penguin Classics. London.
- Perumal Murugan. (2013) *One Part Woman,* Penguin Books, London.

Reference Books

- Ganesan. S. (2015). Asian *Voices: An Anthology of Asian Writings in English.*New Century Book House. Chennai.
- Rajiva Wijesinha. (2007). *Bridging Connections: An Anthology of Sri Lankan Short Stories.* National Book Trust. New Delhi.
- Royall Tyler. (2004). *Ed. & Trans. Japanese No Dramas.* Penguin Books. London.
- Theodore Savory H. (2012). *The Art of Translation*. Jonathan Cape Publications. London.
- Karkala Alphanso, J. (2015) *Indian literature in Translation*. Penguin Publications. London
- Eugene Nida, A. and Charles R. Taber. (2011) *The Theory and Practice of Translation*. E. J. Brill Publications. London

E-Resources

- https://www.wordswithoutborders.org/dispatches/article/10-translated-books- from-india-to- read-now
- www.allsubjectjournal.com
- https://sites.google.com/site/zhmlit/literary-criticism/longinus-s-ideas-on-the-sublime

WOMEN AND LITERATURE
PENM220

Semester : II **Credits : 4**
Category : Core VIII **Hours/Week : 5**
Class &Major: I MA English **Total Hours : 65**

Objectives:
To enable the Students

- Understand the Concept of Feminism and Literature.
- Examine the Role of Women in Literature.
- Appreciate Literature and create their own Witting.

Learning Outcomes:
On Completion of the Course, the Students will be able to

- Understand the Difficulties faced by Women in Patriarchal Society.
- Evaluate the Writing Style of Women in Literature.

UNIT I INTRODUCTION **10 Hour**

Gender Roles –.Theories and Concepts of Feminism – Women's Writing - Feminist Literary Criticism.

UNIT II POETRY **13 Hour**

E. B. Browning	:	A Man's Requirements
ImtiazDharker	:	Another Woman
MeenaKandasamy	:	Apologies For Living On
Margaret Atwood	:	The Animals in that Country
Sylvia Plath	:	Lady Lazarus

UNIT III PROSE **13 Hour**

Sojourner Truth	:	Ain't I a Woman**?**
AudreLorde	**:**	Poetry is Not a Luxury

UNIT IV DRAMA **13Hour**

Caryl Churchill	:	Top Girls
Manjula Padmanabhan	:	Lights Out.

UNIT V FICTION **16 Hour**

Chimamanda Ngozi Adichie	:	Americanah
Manju Kapur	:	Difficult Daughters

Text Books

- Mary Eagleton. Ed. (2010). *Feminist Literary Theory: A Reader*. 3nd edition. Blackwell Publishers. United Kingdom.
- Sandra Gilbert and Susan Gubar. (2000). *The Mad Woman in the Attic: The Woman Writer and the Nineteenth Century Literary Imagination.* Yale Nota Bene. Yale.

Reference Books

- Chimamanda Ngozi Adichi. *Americanah.*(2014). Fourth Estate. United Kingdom.
- Manjula Padmanabhan. (2020). *Lights Out.* Worldview Publications. New Delhi.
- Caryl Churhchill. (2003). *Top Girls.* Bloomsbury. London.

E - Resources

- https://www.learningforjustice.org/classroom-resources/texts/aint-i-a-woman
- https://makinglearning.files.wordpress.com/2014/01/poetry-is-not-a-luxury-audre-lorde.pdf

PRINCIPLES AND METHODS OF ELT

PENM221

Semester : II	**Credits : 4**
Category : Core IX	**Hours : 5**
Class & Major : I MA ENGLISH	**Total Hours : 65**

Objectives:

To enable the Students

- Adapt the Theories of Language Description and Language Learning, and their Implications in Teaching and Learning.
- Understand the Different Methods of Teaching English and Assess them.

Learning Outcomes:

On Completion of the Course, the Students will be able to

- Understand the Principles of course Designing and Testing and Evaluation.
- Acquire the ways of Teaching English as a Second Language.

UNIT I INTRODUCTION 12 Hour

A Brief history of English Language Teaching in India - Psychological principles influence on Language Teaching - Fluency vs. Accuracy – Role of Mother Tongue – Second Language Acquisition.

UNIT II METHODS IN LANGUAGE TEACHING 15 Hour

Grammar Translation Method – Oral Approach – Audio lingual Method – Direct Method – Bilingual Method – Communicative Approach to Language Teaching.

UNIT III TEACHING LANGUAGE AND LITERATURE 13 Hour

Teaching the four Skills of the Language – Techniques in Teaching Drama, Fiction, Prose & Poetry - Vocabulary, Grammar and Composition at various levels -Preparing Lesson Plan.

UNIT IV LEARNING LANGUAGE THROUGH TECHNOLOGY 13 Hour

Language Teaching with ICT, using Modern Instructional Aids like Tape-Recorder, Video, Television, Language Lab - Language Testing and Evaluation - Technology for Testing Language Skills.

UNIT V PROFESSIONAL DEVELOPMENT **12 Hour**

The Role of Teacher and Micro Teaching - Large Classroom Management -Dealing with Classroom Problems - Interview Skills and Resume Writing.

Text books

- Baruah, T C. (2019). *The English Teacher's Handbook*. Sterling Publishers. New Delhi.
- Bose, M.N.K. (2010) *A Text Book of English Language Teaching(ELT) for Indian Students.* New Century Book House Pvt. Ltd. Chennai.

Reference Books

- Donna M. Brinton. (2013). *Teaching English as a Second or Foreign Language.* Routledge. United States.
- Sterne, H.H.(2011) *Fundamental Concepts of Language Teaching.* Oxford University Press. New York.
- Larsen-Freeman, Diane. (2012). *Techniques and Principles in Language Teaching.* Oxford University Press. New York.

APPLIED LINGUISTICS

PENM222

Semester :II	**Credits :4**
Category : Core X	**Hours :5**
Class & Major : I MA ENGLISH	**Total Hours : 65**

Objectives:

To enable the Students

- Understand Different Aspects of Languages and how they can be Studied.
- Analyse the Broad areas in the field of Applied Linguistics including Language Structure and Language use in relation to Language Acquisition, Brain, Culture, Society, Communication and Computation.
- Explain the Stylistic Analysis of a Literary.

Learning Outcome:

On Completion of the Course, the Students will be able to

- Understand the key Concepts in Applied Linguistics.
- Appreciate the Interdisciplinary Nature of Linguistics
- Identify an area within the Field of Applied Linguistics

UNIT I INTRODUCTION AND SCOPE OF APPLIED LINGUISTICS **12 Hour**

A Brief History: the Interdisciplinary Nature of Applied Linguistics - Relation between Theoretical Linguistics and Applied Linguistics- Scope of Applied Linguistics - Characteristics of Language - Language variety: Dialect, Register, Style, and Mode -Context of Situation - Native and Non-Native Varieties.

UNIT II STRUCTURAL LINGUISTICS

13Hour

Structural Linguistics: Phonetics and Phonology, Syntax, Procedures of Analysis and Classification

UNIT III TRANSFORMATIONAL- GENERATIVE LINGUISTICS **15 Hour**

Transformational-Generative Linguistics: Goals of the theory - Syntax Structure Model - Aspects Model - some Post-aspect Models - Other Approaches: Indian and Western.

UNIT IV APPLIED LINGUISTICSANDSTYLISTICS **10 Hour**

Linguistics and Language Teaching: Contrastive analysis – Stylistics.

UNIT – V LANGUAGE TECHNOLOGY **15 Hour**

Artificial Intelligence, Parsers, Pooperative Response Systems; Speech Technology -Text-to-Speech and Speech-to-Text Systems - Machine Translation - Role of technology in Language Teaching and Learning – radio - T.V- the Language Laboratory - Computer Aided Language Teaching and Learning (CALT/ CALL).

Practical Work: Analysis of Language use in Newspapers - Television - Internet etc - hands - on Practice with Machine Translation Software.

Text Books

- Cook. G. (2003). *Applied Linguistics*. Oxford University Press.UK.
- Dash. N.S. (2005). *Corpus Linguistics and Language Technology*. Mittal Publication. New Delhi.
- George Yule. (2010). *Study of Language*. Cambridge University Press. Cambridge.
- Ball M. J. (2014). *Theoretical Linguistics and Disordered Language*. Croom Helm. London and Sydney.
- Bennett, W.A (2007). *Aspects of Language and Language Teaching*. Cambridge University Press. London.

Reference Books

- Bukingham and Eskey. (2011). *Toward a definition of Applied Linguistics*.R. Kaplan (ed.). On the Scope of Applied Linguistics (pp. 1-3). Newbury House. Rowley, MA.
- Collinge, N. E. (ed). (2017). *An Encyclopedia of Language.* London.
- Kaplan, R. B. (2002). *Oxford Handbook of Applied Linguistics.* Oxford University Press. New York.
- Richards and Rodgers. (2010). *Approaches and Methods in Language Teaching.* CUP. Cambridge.

E - Resources

- https://onlinecourses.nptel.ac.in/noc20_hs51/preview
- http://applij.oxfordjournals.org/

ACADEMIC WRITING

PENE203

Semester	**: II**	**Credits**	**: 4**
Category	**: Non-Major Elective/ SEC**	**Hours**	**: 5**
Class & Major	**: I MA ENGLISH**	**Total Hours**	**: 65**

Objectives:

To enable the Students

- Develop the Reading and Writing skills for Personal and Academic Purpose.
- Enhance the Interpretative ability to Critically Analyse and Appreciate Literary texts

Learning Outcome:

On Completion of the Course, the Students will be able to

- Produce Standard Academic Work
- Refine and Improve their Language Style

UNIT I WRITING A SUMMARY AND RESPONSE 10Hour

Writing Practice: Identifying Arguments – Summarizing - Forming and expressing a point of view.Editing Focus: Paraphrasing - Subject-verb agreement

UNIT II WRITING A DESCRIPTIVE ESSAY 13Hour

Reading: Cherries for My Grandma by Geoffery Canada--Writing Practice: Analyzing Essay Organization - Writing detailed examples as support - Using a Summary as an Introduction Editing focus: Adjective Clauses - Habitual past: would vs. used to- Writing a Classification Essay – Reading: Some Reflections on the Technology of editing Writing Practice: Determining an Organizing Principle for Categorization - Categorizing and avoiding overlapping - Developing conclusions for Classification essays -Editing focus: Pronoun referents

UNIT III WRITING AN ADVANTAGES–AND–DISADVANTAGES ESSAY 13Hour

Reading: Appropriate & Inappropriate Mail - Writing practice: Summarizing and incorporating Academic Research as Support Responding to a Quote- More on using a Summary as an Introduction Using the Conclusion to Unit an essay Editing focus: Bibliographies or "Works Cited" lists - Citations for Online references - Citations within a Text.

UNIT IV WRITING A CAUSE –AND-EFFECT ESSAY 14 Hour

Reading: Excerpt from The Face of Beauty by Diane Ackerman-Writing practice: Developing Different Types of Support - Writing up Research studies Showing Cause and Effect - Outlining an Essay-Editing focus: Adverbial Clauses - Causal Connectors - Reported Speech-Writing a Comparison–and-Contrast Essay-Reading: "A Holistic Approach to Personality Analysis. The Myers-Briggs Type-Indicator"-Writing Practice: Developing introductions - Assessing the value of a theory-Editing focus: Clauses for Comparison, Contrast and Concession – Transitional Expressions between Sentences.

UNIT V WRITING A LITERARY ANALYSIS ESSAY 15Hour

Reading: Excerpt from The Kite Runner, by Khaled Hosseini-Writing practice: Analyzing Mood - Summarizing a story - Understanding Plot Devices- Writing about symbols - Organizing an Introduction for a Literary Analysis Essay-Integrating quotes with Text - Integrating Simile, Metaphor, and Personification-Editing focus: Present and Past unreal Conditions- Writing an Argumentative Essay Reading &Writing Practice: Identifying arguments and counter arguments -Refuting an argument -Organizing an Argumentative Essay - Synthesizing Information to form Arguments-Editing Focus: Unstated Conditionals - Noun Clauses.

Text Books

- Mary Colonna, and Gilbert, Judith.(2006*). Reason to Write*. Oxford University Press. Oxford.

Reference Books

- Stephen Bailey. (2011). *Academic Writing: A Handbook for International Students*. Routledge (Third edition). Canada.
- Alice Savage. (2012). *Effective Academic Writing: Developing Ideas*. University Press. Oxford.
- Alice Savage and Shafiei, Masoud. (2012). *Effective Academic Writing: The Paragraph.* Oxford University Press. Oxford.

COPY EDITING
PENE202

Semester : II **Credits : 4**
Category : Non – Major Elective/SEC **Hours/Week : 5**
Class &Major: I PG **Total Hours : 65**

Objective:
To enable the Students

- Introduce the fundamental techniques of Copy Editing.
- Develop their skills in proof reading and copy editing Research paper, Books, Journals and Magazines etc.
- Enhance their Skills in Copy Editing.

Learning Outcome:
On Completion of the Course, the Students will be able to

- Use the strategies in the process of Copy Editing.
- Produce Standard Academic Book without Errors.

UNIT I **13Hour**

Introduction - What is Copy Editing? - Type scripts, hard copy, electronic copy or - Soft Copy - Capturing the Text electronically - Role of a Copy Editor - Basic Rules of Copy Editor

UNIT II **13Hour**

Language – Grammar - Parts of Speech - Bias- Free Language - American and British Spelling -Punctuation

UNIT- III **13Hour**

Introduction to Proof Reading - Marking Proofs - Basic Proof Reading Symbols - Marking Corrections on a Proof

UNIT IV **13Hour**

Styles - In House Styles- Use of Style Sheet - Editing Bibliography - How to Copy Edit Text - Online Editing

UNIT V **13Hour**

Practice Passages for Proof Reading and Copy Editing

Text Books

- Butcher., (2006).*Copy Editing: The Cambridge Handbook for Editors, copyeditors and proof readers,* Cambridge University Press New Delhi.

Reference Books

- Vijay Nicole., (2006). *Hundred Tests for copy Editing/ Technical Writing,* Cambridge University Press. New Delhi.

III AND IV EVALUATION AND COMPONENTS OF CIA

Semester	Category	Course Code	Course Title	Component – III	Component – IV
I	Major Core I/ DSC	PENM118	British Literature – I	Assignment	Seminar
	Major Core II/ DSC	PENM119	American Literature	Seminar	Paper
	Major Core III/ DSC	PENM120	Advanced English Grammar	Assignment	Seminar
	Major Core IV/ DSC	PENM121	Literary Criticism	Paper Presentation	Review Writing
	Major Core V/ DSC	PENM122	Human Rights and Subaltern Literature	Assignment	Case Study
II	Major Core VI/ DSC	PENM218	British Literature – II	Assignment	Seminar
	Major Core VII / DSC	PENM219	Literatures in Translation	Paper Presentation	Translation
	Major Core VIII/ DSC	PENM220	Women and Literature	Assignment	Seminar
	Major Core XI/ DSC	PENM221	Principles and Methods of ELT	Role Play	Album Making
	Major Core X/ DSC	PENM222	Applied Linguistics	Paper Presentation	Seminar
	Non-Major Elective/ SEC	PENE202	Copy Editing	Assignment	Seminar
		PENE203	Academic Writing	Paper Presentation	Poster Presentation

DEPARTMENT OF BUSINESS ADMINISTRATION

PREAMBLE

UG: Programme Profile and Syllabus of Courses Offered in Semester V and VI along with its Evaluation Components (With effect from 2021 – 2024 batches onwards).

PROGRAMME PROFILE BBA

PROGRAMME SPECIFIC OUTCOME (PSO)

Upon completion of the Programme, the students will be able to

- Understand and Operative with Ethical and Professional Responsibility.
- Ability to Communicate Effectively and Function Efficiently on Multidisciplinary Teams.
- Ability to Use Modern Management Principles and Tools Needed in Contemporary Business within the Bounds of Practical Constraints Such as Economic, Environmental, Social, Political, Ethical, Health and Safety and Sustainability.

Semester	Part	Category	Course Code	Course Title	Previous Course Code	Contact Hrs/ Week	Credit Min/Max
I	I	Languages/ AECC-II	UTAL107/ UTAL108	Basic Tamil - I/Advanced Tamil – I/ French I /Hindi I	UTAL105 /UTAL106/ UHIL101/ UFRL101	5	¾
	II	Communicative English AECC-I	UCEL101/ UCEL102	Communicative English I /Effective Communicative English I	UENL 107/ UENL 108	5	¾
	III	Major Core I/(DSC)	UBAM109	Business Communication	UBAM 311	6	5
		Major Core II/ (DSC)	UBAM108\ UCOM104\ UCCM102	Financial Accounting	-	6	4
		Allied – I/ (GE)	UCEA103	Business Economics	UCEA101	6	5
		PE	UPEM101	Professional English I		6	4
	IV	Value Education (SEC)		Family Life Education	-	2	1
					TOTAL	**36**	**25/27**
	I	Language AECC –II	UTAL207/ UTAL208 UFRL202/ UHIL 202	Basic Tamil II/Advanced Tamil II/ French II /Hindi II	UTAL 205/ UTAL 206	5	¾
	II	Communicative English / AECC – I	UCEL201/ UCEL 202	Communicative English –II/ Effective Communicative English II	UENL207/ UENL208	5	¾
II	III	Major Core IV /(DSC)	UBAM209	Advertising and Sales Promotion	UBAM 206	5	4
		Major Core V /(DSC)	UBAM207	Principles of Management	UBAM107 UBAM102	5	4

	III	Major Core VI(DSC)	UBAR201	Workshop on Decision Making Skills	-	1	1
		Allied - II (GE)	UCOA203	Accounting Package Theory	-	3	2
		Allied - Practical I (GE)	UCOR 203	Accounting Package Practical	-	3	2
	IV	Non Major Elective(SEC)			-	3	2
		PE	UPEM201	Professional English		6	4
	V	Extension activity / Physical Education/ NCC				-	½
					TOTAL	**36**	**26/29**
III	III	Major Core VII(DSC)	UBAM308	Marketing Management	UBAM402	5	5
		Major Core VIII(DSC)	UBAM310/ UCOM305/ UCCM305	Cost Accounting	-	5	5
		Major Core IX(DSC)	UBAM312	Creativity For Innovative Management	-	4	4
		Major Core X(DSC)	UBAM313	Organizational Behavior	UBAM401/ UBAM406	5	4
		Online Course	UMAV381	NPTEL / SPOKEN TUTORIAL	-	3	½
		Allied (GE)	UMAA301	Business Statistics	UMAA303	6	4
	IV	Value Education (SEC)		Environmental science		2	1
					TOTAL	**30**	**24/25**
IV	III	Major Core XI(DSC)	UBAM405	Production & Materials Management	-	4	4
		Major Core XII(DSC)	UBAM408	Micro, Small and Medium Enterprises	UBAM406	4	5
		Major Core XIII(DSC)	UBAM407	Human Resource Management	UBAM302	4	4
		Allied	UCSA409	Business Analytics and Intelligence		6	5
		Major Core XIV (DSC)	UBAR401	Workshop On Creative Thinking Skill	-	1	1
		Allied IV	UMAA410	Quantitative Techniques In Business	UMAA505	6	4
	IV	Soft Skill			-	2	1
		Non Major Elective (SEC)				3	2
	V	Extension activity / Physical Education / NCC				-	0/2
					TOTAL	**30**	**26/28**
V	III	Major Core XV(DSC)	UBAM507	Research Methodology in Business	UBAM403	3	3
		Major Core XVI(DSC)	UBAM508	Services Marketing	-	5	4
	III	Major	UBAM510	Stress Management	-	5	4

V	IV	Major Core XVIII (DSC)	UBAM504/ UCOM507/ UCCM507	Management Accounting	UBAM502	5	5
		Major Core XIX(DSC)	UBAP501	Project	UBAP601	5	5
		Major Elective (DSE)	UBAO501	Total Quality Management		5	4
			UBAO502	Corporate Governance			
	IV	Value Education				2	1
					TOTAL	**30**	**26**
VI	III	Major Core XX(DSC)	UBAM608	Strategic Management	-	5	4
		Major Core XXI(DSC)	UBAM610 UCOM614 UCCM614	Financial Management	UBAM610	6	4
		Major Core XXII(DSC)	UBAM612	Entrepreneurial Development	-	6	5
		Major Core XXIII(DSC)	UBAR601	Workshop On Leadership Skills	-	1	1
		Major Core XXIV(DSC)	UBAM613	Global Business in Management	-	5	4
		Viva Voce	UBAM611	Comprehensive viva	-	-	1
		Major Elective	UBAO609	Consumer Affairs	-	5	4
			UBAO604	Customer Relationship Management			
			UBAO606	Operation Management			
			UBAO607	Consumer Production			
	IV	Soft Skill			-	2	1
	V	Extension activity / Physical Education/ NCC				-	-/2
					TOTAL	**30**	**24/26**
					GRAND TOTAL	**192**	**148/161**

- Innovated and Developed Skills to be a Life-Long Learner for a Globalized Business for Future.

NON MAJOR ELECTIVES
(These courses are offered to all major except BBA)

Semester	Part	Category	Course Code	Course Title	Previous code	Contact Hrs/Week	Credit Min/ Max
II	IV	Non Major Elective –I	UBAE202	Leadership Skills	-	3	2
		Non Major Elective-II	UBAE203	Team Building		3	2
		Non Major Elective-IV	UBAE304	Rural Management	UBAE404	3	2
		Non Major Elective-IV	UBAE405	Consumer Behaviour		3	2

EXTRA CREDIT EARNING PROVISION

Semester	Category	Course code	Course Title	Contact Hrs/ Week	Credit Min/ Max
II	Internship	UBAI201	Summer Internship	-	1
IV	Internship	UBAI401	Summer Internship	-	1

EXTRA CREDIT EARNING PROVISION

Semester	Category	Course code	Course Title	Contact/ Week	Credit Min/ Max
III	Self study paper	UBAS201	Office Management	2	1
IV	Self study paper	UBAS401	Travel and Tourism Management	2	1
V	Self study paper	UBAS501	Business Ethics	2	1
VI	Self study paper	UBAS502	Corporate Social Responsibility	2	1

SKILL ORIENTATION PROGRAMME (MANDATORY/ONLY FOR INTERESTED STUDENTS) – EXTRA CREDIT EARNING

Semester	Category	Course Code	Course Title	Collaborating Agency	Hours/Days /Month	Mode of Evaluation	Credits
							Max/Min
II	Core	UBAT201	Certificate in Financial Accounting with Tally	TCIL	4 Days	Reflection	1
IV	Core	UBAT401	Start-up Training	TCIL	4 Days	Reflection	1
VII	Core	UBAT601	Aptitude & Soft Skills	TCIL	4 Days	Reflection	1

BUSINESS COMMUNICATION
UBAM109

Semester : I **Credit : 5**
Category : Core II/(DSC) **Hours/Week: 6**
Class & Major: I BBA **Total Hours : 78**

Objectives:

To enable the students

- Gain Knowledge about the Importance of Communication.
- Interpret Information with Internal and External Parties.
- Implement the Plan with Good Communication with the Concerned Parties.

Learning outcomes:

On completion of this course, the students will be able to

- Identify other Common methods of Professional Communication.
- Discuss the Importance of Communication Ethics in Business Communication.
- Determine the Appropriate Communication Channel for a Specific Type of Message.

UNIT I CONCEPT OF COMMUNICATION **16 Hours**

Meaning - Definition – Process – Need – Feedback - Principles of Effective Communication – Barriers to Communication: Physical - Semantic/Language - Socio Cultural and Psychological Barriers - Ways to Overcome these Barriers - Types of Communication.

UNIT II CHANNELS OF COMMUNICATION **16 Hours**

Formal and Informal - Vertical – Horizontal – Diagonal - Grapevine. Business Letters and Layout: Parts – Structure- Layouts - Full Block - Modified Block - Semi – Block - Principles of Effective Letter Writing.

UNIT III Bank Correspondence **16 Hours**

Bank Correspondence – Insurance Correspondence – Agency Correspondence – Correspondence with Shareholders, Directors- Trade Letters – Inquiry – Order - Credit and Status Enquiry – Complaints – Claims - Sales Letters - Promotional Leaflets and Fliers.

UNIT IV REPORT WRITING **16 Hours**

Agenda - Minutes of Meeting – Memorandum – Office Order – Circular Notes Correspondence with Share Holders – Correspondence with Directors

UNIT V MODERN FORMS OF COMMUNICATION **14 Hours**

Fax – E-mail – Video Conferencing – Benefits and Perils of Communication through Social Media: Website and Apps.

Text Books

- Gupta, C.B. (2017). *Business Communication.* Organization and Management. S.Chand Publications. Chennai.
- Rajendra Pal, G. & Korlahalli, C. (2009). *Essentials of Business Communication.* S.Chand Publications. Chennai.
- Raghunthan, N.S.B. & Santhanam, S.K. (2017). *Business Communication*. *Margham Publications*. (3rd Ed.). TMH Publication.

Reference Books

- Rames, M.S. Pattanshetty.R (2016). *Effective Business English and Correspondence*. S.Chand & Son. New Delhi.
- Shutter, R. (2008). *Effective Letters and Business Law*. TMH Publication. New Delhi.

E- Resources

- https://libguides.wccnet.edu/oer-subjects/business-communication
- https://courses.lumenlearning.com/wm-businesscommunicationmgrs/

FINANCIAL ACCOUNTING

UBAM108\UCOM 104\ UCCM102

Semester : I **Credit : 4**
Category : Core IV **Hours/Week: 6**
Class & major: I BBA/I B.Com/ B.Com (CA) **Total Hours:78**

Objectives:

To enable the students

- Understand the need for record keeping in business
- Create awareness about the methods of book - keeping.
- Prepare financial statement.

Learning outcomes:

On completion of this course, the students will be able to

- Identify and define pertinent research questions
- Critically review the relevant literature
- Define an appropriate methodology

.

UNIT I INTRODUCTION **16 Hours**

Meaning and scope of Accounting, Basic Accounting Concepts and Conventions- Objectives of Accounting- Accounting Transactions- Double Entry Book Keeping -Journals, ledger, Preparation of Trial Balance- final accounts with adjustments.

UNIT II SINGLE ENTRY SYSTEM **16Hours**

Single Entry- Meaning, Features, Defects, Differences between single Entry and Double Entry System- Statement of Affairs Method- Conversion Method (Only simple Problems)

UNIT III BRANCH & DEPARTMENTAL ACCOUNTS **16 Hours**

Branch accounts M- Dependent branches- Debtors system- Stock & Debtors System- Independent branch (Excluding Foreign branch) Departmental accounting - Basis for allocation of expenses - Interdepartmental transfer at cost or selling price- Treatment of expenses which cannot be allocated.

UNIT IV HIRE PURCHASE SYSTEM **14 Hours**

Hire purchase system - Calculation of Interest - Default and repossession - Hire purchase Trading Accounts.

UNIT V PARTNERSHIP ACCOUNTS **16 Hours**

Partnership accounts - Admission - Retirement, Death, Dissolution & Insolvency of Partners (Garner Vs Murray)

Text Books

- T.S. Reddy ,& A. Murthy.(2019). *Financial Accounting* - Margham Publications Chennai

Reference Books

- R. L. Gupta & V. K. Gupta.(2017) *Advanced Accounting* Sultan Chand & Sons New Delhi.
- Jain & Naran. (2016) *Financial Accounting*- Kalyani Publishers. New Delhi.

BUSINESS ECONOMICS

UCEA103

Semester	**: I**	**Credit**	**: 5**
Category	**: Allied**	**Hours/Week**	**: 6**
Class Major	**: B.B.A&B.Com**	**Total Hours**	**: 78**

Objective:

To enable the students

- Analyze the Economic problems related with business decision &application of Economic theory to the business problems.
- Analysis the relationship between productivity, prices and profitability.

Learning outcomes:

On completion of this course, the students will be able to

- Understand the roles of managers in firms.
- Analyze the demand and supply conditions and assess the position of a company.
- Design competition strategies, including Cost, Pricing, and Product differentiation.

UNIT I INTRODUCTION **15 Hours**

Definition- Nature and Scope of Business Economics-Importance-Decision Making in Business- Objective of Business Firms-Social responbilities of Business- Role and Responsibilities of Business Economist.

UNIT II LAW OF DEMAND **15 Hours**

Demand analysis: Meaning-Demand determinants-Law of Demand-Elasticity of demand: Types & Importance of elasticity of demand-Demand Forecasting: Meaning-Methods of demand Forecasting-demand forecasting method for the new products-Criteria for a good Forecasting method.

UNIT III COST, REVENUE& BREAK EVEN ANALYSIS **16 Hours**

Money Cost- Real Cost-Implicit and Explicit Cost-Opportunity Cost-Short Run and Long Run Cost Curves Total Revenue-Average Revenue-Marginal Revenue-Relationship between AR and MR Curve-Some Special cases of Revenue Curves-Break-Even Analysis-Determination of Break-Even Point-Uses-Assumptions- Limitation.

UNIT IV MARKET STRUCTURE & PRICING METHODS **16 Hours**

Features and Types of market: Pricing Under Perfect Competition-Meaning and features of Monopoly, Monopolistic Competition and Oligopoly-Meaning and Objectives of Pricing Policy-Factor and Method of Pricing.

UNIT V CAPITAL BUDGETING **16 Hours**

Meaning and Objectives of Capital Budgeting –Need for Capital Budgeting –Forms of Capital Budgeting-Nature of Capital Budgeting Problem- Project Profitability: Methods of Appraising Project Profitability.

Text Books

- Sankaran.S. (2008). *Business Economics*. Margham Publication, New Delhi.
- Tata McGaw HillErue.N and Eoad Way.R,(1984) *Welfare Economics*, Basil Bluckwell, Oxford. New Delhi.

Reference Books

- Dewett.K.K.(1998). *Morden Economic Theory*. Madras Unviresity.
- Agarwal.H.S. (1998). *Advance Economic Theroy*. Konark Publication. New Delhi.
- Dacosta.G. (1980). *Production, Pricies and Distribution*. New Delhi.

ADVERTISING MANAGEMENT AND SALES PROMOTION

UBAM209

Semester : I **Credit : 4**
Category : Core IV (DSC) **Hours / Week: 5**
Class & Major: I BBA **Total Hours : 65**

Objectives:

To enable the students

- Understand the Nature, Purpose of Planning and Execution of the Successful Advertising Program.
- Improve the Sales through Various Promotions.
- Stimulate Sales amongst Present, Former and Future Consumer.

Learning outcomes:

On completion of this course, the students will be able to

- Promote an Overall Image of Respect and Trust for an Organization.
- Motivate Distributors, to Create or Change a Company's Image.
- Create or Change a Buyer's Attitude.

UNIT I ADVERTISING **10 Hours**

Definition – Objectives - Need & Importance - Growth of Modern Advertising – Types & Classification of Advertisement - Advertising Spiral – Market Segmentation, Promotional Mix and Target Audience.

UNIT II MEDIA **15 Hours**

Mass Media-Selection, Planning and Scheduling – Web advertising – Integrated Programme and Budget Planning –Percentage of Sales Method, Objective to Task Method - Competitive Parity - Market Share Method - Unit Sales Method - Affordable Method.

UNIT III DESIGN AND EXECUTION OF ADVERTISEMENTS **14 Hours**

Message development – Different types of advertisements – Layout – Design appeal – Copy structure – Advertisement production – Print – Radio. T.V. and Web advertisements – Media Research – Testing validity and Reliability of ads – Measuring impact of advertisements – case studies.

UNIT IV MANAGEMENT OF SALES PROMOTION **12 Hours**

Importance & Need for Sales Promotion - Planning for Consumer Schemes & Contests - Different Types of Consumer Schemes.

UNIT V CONTROL **14 Hours**

Measurement of Effectiveness – Ethics- Economics and Social Relevance-Sales promotion – Requirement identification – Designing of sales promotion campaign – Involvement of salesmen and dealers – Out sourcing sales promotion national and international promotion strategies-Accountability factors and Ethics.

Text Books

- Bhatia, T.K. (2007). *Advertising and Marketing in Rural India*. (2nd Ed.,). Macmillan India Ltd. Pondicherry.
- Hackley, C. (2010). *Advertising and Promotion*. An integrated communication approach. (2nd Ed.). Sage Publications. Calcutta.

Reference Books

- Aaker, M.& Batra, R. (2016) *Advertising Management*. Prentice Hall. Calcutta.
- Wells, M. & Burnett, S. (2007). *Advertising Principles & Practices*. Prentice Hall. New Delhi.

E-Resource

- https://www.tandfonline.com/doi/abs/10.1080/03615260902877084?journalCode=wser20

PRINCIPLES OF MANAGEMENT
UBAM 207

Semester : II ` **Credit : 4**
Category : Core III **Hours/week: 5**
Class & Major: I BBA **Total Hours : 65**

Objectives:
To enable the students

- Identify the management concepts.
- Recall the Management Principles.
- Apply the management principles in Business.

Learning outcomes:
On completion of this course, the students will be able to

- Describe the influence of historical forces on the current practice of management.
- Identify and evaluate social responsibility and ethical issues.
- Identify and properly use vocabularies within the field of management

UNIT I LEVELS OF MANAGEMENT AND PLANNING 12 Hours

Levels of management – Roles of manager, Management as a Science or Art – Approaches to management- Definition– Nature – Importance – Forms – Types – Steps in Planning – Objectives – Policies – Procedures and Methods – Nature and Types of Policies – MBO – Case Studies.

UNIT II DECISION MAKING 10 Hours

Decision Making – Process of Decision making – Types of Decisions – Problems involved in Decision making – Forecasting – Decision Tree – Case Studies.

UNIT III ORGANIZING 14 Hours

Organizing - Nature & Importance – Principles of Organizing Delegation & Decent realization – departmentation – Span of Management. Organizational structure – Line & staff and functional – Organizational charts and manual – making organizing effective– Staffing.

UNIT IV DIRECTING 14 Hours

Function of directing – Motivation – Major Theories of motivation (Need hierarchy theory – hygienic approach – Expectancy Theory – Mc clelland theoy) – 4 Motivation techniques – Leadership – Definition –Theories and approach to leadership – Styles of leadership – Types – Case Studies.

UNIT V CONTROLLING& CO-ORDINATION 15 Hours

Nature – Problems – Effective coordination- Control – Nature – Basic control process – Importance – Control techniques – traditional and non-traditional Control devices – Use of Computers in managing information – Case Studies.

Text Book

- Tripathi P.C. & P.N. Reddy. (2007) *Principal of Management*. TMH. 4th Edition. New Delhi.

Reference Books

- L.M. Prasad. (2009.) *Principles and practices of Management.* Sultan Chand & Sons. New Delhi.
- G. Swarnalatharaju. (2007) *Principles of Management*. Scitech Publications Pvt Ltd. Chennai
- George Terry. (2006). *Principles of Management*. A.I.T.B All India Travel Pvt Ltd. New Delhi.

LEADERSHIP SKILLS

UBAE202

Semester : II **Credit : 2**
Category : Non major Elective – I **Hours/Week : 3**
Class & Major: I UG **Total Hours : 39**

Objectives:

To enable the students

- To understand the importance & effects of leadership.
- To make use of the leadership skills in student's life.
- To inspire them to become a leader.

Learning outcomes:

On completion of this course, the students will be able to

- Understand Personal skills and styles.
- Develop mentor/mentee relationships.
- Understand and react to contextual influence.

UNIT I INTRODUCTION OF LEADERS 8 Hours

Who are leaders – Examples of Successful leaders – Their Contribution- Mahatma Gandhi, Nelson Mandela, Mother Theresa – Leadership Styles .

UNIT II BUSINESS LEADERS 7 Hours

Indra Nooyi- Kiran Mazumdar- Ratan Tata-Warren Buffet-Bill Gates-Narayana Moorthy- Dhirubai Ambani-Their Contributions and Value Systems

UNIT III LEADERSHIP THEORIES 8 Hours

Leadership Theories – Essentials of Future Leaders - Future of Leadership - Challenges Faced Leadership Theory.

UNIT IV SITUATIONAL LEADERSHIP 8 Hours

Situational Leadership – Management Effectiveness Vs Leadership Effectiveness – Successful Leadership Vs Effective Leadership – Determinants of situational leadership.

UNIT V LEADERSHIP EFFECTIVENESS 8 Hours

Leadership effectiveness – Meaning- Requirements- Prerequisites for Leadership for 21st Century Organization- Ethical Leadership- Value Based Management.

Text Books

- James A.F. Stoner. R. Edward Freeman. Daniel R. Gilbert (2007) *Management* prentice. Hall of India. Delhi.

Reference Books

- Dinkar Pagare (2002). *Principles of management.* Sultan Chand. Delhi.
- Koontz and O'donnel. (2002) .*Essentials of management*. Tata McGraw Hill. Delhi
- Terry Franklin (2000). *Principles of Management*. All India Publishers and Distributors. New Delhi

TEAM BUILDING

UBAE203

Semester : II **Credit : 2**
Category : Core IV **Hours/Week: 3**
Class & Major: I UG **Total Hours : 39**

Objectives:

To enable the students

- Understand the Concepts and Components of Team Building.
- Execute Group Activities for Corporate Events and Identify their Creative Thoughts.
- Create a Successful Team.

Learning outcomes:

On completion of this course, the students will be able to

- Understand Every Individual's Strengths and Weaknesses.
- Use Positive Impacts for the Productivity of Employees.
- Develop High Confidence and Productivity Levels.

UNIT I INDIVIDUAL BEHAVIOUR **8 Hours**

Meaning – Foundation of Individual Behaviors – Models of Man's Personality – Determinants of Personality – Stages of Personality Development – Attitude & Values.

UNIT II GROUP BEHAVIOURS **8 Hours**

Meaning of Group – Reasons for Formation of Groups – Characteristics of Groups – Types of Groups – Group Cohesiveness – Group Decision Making Process – Small Group Behavior.

UNIT III GROUP DYNAMICS **7 Hours**

Group Dynamics – Nature of Teams; Teams vs Group - Why do People Join Groups - Group Development - Usefulness of Groups in Organization - Pitfalls of Groups - Determinants of Group Behavior.

UNIIV TEAM DYNAMICS **8 Hours**

Team Dynamics-Nature of Teams - Teams Vs Groups - Benefits from Teams - Types of Team - Implementing Teams in Organization - Team issues - Effective Teamwork - Typically Teams in Organization - Can Groups Become Teams – Case Study.

UNITV TEAMBUILDING **8 Hours**

Team and Organizational Culture- Team Building- Process – Team Building and Team Training – Communication and its Role in Team Building-Interpersonal relationship in team building.

Text books

- Blum, M.L. (2009). *Industrial Psychology and its Social Foundation.* S. Chand & Sons. New Delhi.
- Hersey Blanchard, S.R. (*2010). Introduction to Organizational Behavior*. Tata Mc Grow Hill. Chennai.

Reference books

- Hippo, K. (2009). *Organizational Behavior.* S.Chand & Sons. New Delhi.
- Jayashakar, S. (2009). *Organizational Behaviors*. Margham Publication. New York.

E-Resources

- www.mindtools.com/pages/article/virtual-team-building
- www.teamtechnology.co.uk/teambuilding.

WORKSHOP ON DECISION MAKING SKILLS

UBER201

Semester : II **Credit : 1**
Category : Core VI **Hours/week : 1**
Class & Major: I BBA **Total Hours : 13**

Objectives:
To enable the students

- Use several Problem Solving and Decision making Skills.
- Apply Logical and Creative Approaches to Solving Problems and Making Decisions

Learning Outcomes:

- Understand and evaluate the decision to be made and the potential outcomes.
- Classify the decision and what the important factors are..
- Structure their approach to making decisions.
- Evaluate options against set criteria and avoid typical decision making traps.

TOPICS:

- Identifying the challenges
- Prioritizing the problem
- Brainstorming
- Evaluating positive and negative consequences of each solutions
- The Creative Process for Making Decisions
- Barriers to Creativity & Overcoming them, Part I
- Barriers to Creativity & Over-coming them, Part II
- Tools to Improve Creativity
- The Analytical Process in Decision Making
- Tools to Improve Analysis
- Irrational Factors and Emotions that Affect Decision Making

Evaluation Components of CIA & ESE

S.NO	CATEGORY	CIA I	ESE
1	Pratical Assessment	30	
2	Test I	10	
3	Viva I	05	
4	Test II	10	
5	Viva II	05	
6	Record/PE		30
7	Viva		10
	Total	**60**	**40**

III &IV EVALUATION COMPONENTS OF CIA

Semester	Category	Course Code	Course Title	Component III	Component IV
I	Major core I	UBAM105	Business Communication	Assignment	Report Writing
I	Major core II	UBAM108 UBAM108\ UCOM 104\ UCCM102	Financial Accounting	Problem Solving	Financial statement analysis
I	Allied I	UCEA103	Business Economics	Assignment	Case Studies
II	Major Core IV	UBAM209	Advertising and sales Promotion	Album Making	Poster Presentation
II	Major Core V	UBAM207	Principles of Management	Assignment	Poster Presentation
II	Non Major Elective	UBAE203	Team Building	Assignment	Poster Presentation

DEPARTMENT OF COMMERCE

PREAMBLE

UG: Programme Profile and the Syllabi of Courses Offered in Semester I and II along with III and IV Evaluation Components (with effect from 2021-2024 Batch onwards)

PROGRAMME PROFILE B.Com.

(Learning Outcome Based Curriculum Framework (Locf)

Programme Specific Outcomes (PSO)

Upon Completion of the Programme, the Students will be able to

- Understand the Accounting Concepts and Convention.
- Analyze the Practical Tools of Finance Required in Decision Making.
- Apply Contextual Knowledge To Assess Societal, Health, Safety and Legal Relevant to the Professional Accounting Practice.
- Develop Accounting and Entrepreneurial Skills.

Semester	Part	Category	Course Code	Course Title	Previous Course Code	Contact Hrs/ Week	Credits Min/ Max
I	I	Part I Languages/ AECC-1I	UTAL107/ UTAL108/ UHIL102/ UFRL102	Basic Tamil I/ Advanced Tamil I/ Hindi I /French I	UTAL103/ UTAL104/ UHIL101/ UFRL101	5	3 / 4
	II	Part II Languages/ AECC-1	UENL109/ UENL110	English for Communication I (Stream – I) English for Communication II (Stream – II)	UENL106	5	3 / 4
	III	Core I/ (DSC)	UCOM104/ UCCM102	Financial Accounting	UCOM103/ UCCM101	6	5
		Allied I/(GE)	UCEA103	Business Economics	UCEA102	6	4
		Allied II/(GE)	UMAA112	Business Mathematics	UMAA214	6	4
		PE	UPEM101	Professional English I	--	6	4
	IV	VE(SEC)		Family Life Education		2	1
					TOTAL	**36**	**24/26**
II	I	Part I Languages/ AECC-1I	UTAL207/ UTAL208 UFRL202/ UHIL202	Basic Tamil – II/ Advanced Tamil –II/ French – II/ Hindi – II	UTAL203/ UTAL204/	5	3 / 4
	II	Part II Languages/ AECC-1	UENL209/ UENL210	English for Communication I (Stream – I)	UENL206	5	3 / 4
				English for Communication II (Stream – II)			
	III	Core II/(DSC)	UCOM204/ UCCM203	Business Correspondence	---	5	4
II		Core III/(DSC)	UCOM206/ UCCM206	Management Accounting	UCOM507/ UCCM507/ UBAM408	5	5

II		Allied III/(GE)	UCEA202	Indian Economic Development	UCEA301	6	4
		Core IV	UCOR206/ UCCR206/ UIAR203	Industry Interface Programme I – Banking and Insurance	UCOR205	1	1
		PE	UPEM201	Professional English II	--	6	4
	IV	NME /(SEC)				3	2
	V	Extension Activity/ Physical Education				-	1 / 2
					TOTAL	**36**	**27/30**
III	III	Core V/(DSC)	UCOM305/ UCCM305/ UBAM310	Cost Accounting	UCOM501/ UCCM501	5	4
		Core VI/(DSC)	UCOM306/ UCCM306/ UBAM308	Marketing Management	UCOM606/ UCCM601	4	4
		Core VII/(DSC)	UCOM307/ UBAM309	Financial Markets & Services	UCOM303	6	4
		Core VIII/ (DSC)	UCOM308/ UCCM308	Accounting for Non - Trading Concerns	---	4	4
		Online Course		NPTEL/ Spoken Tutorial	---	3	1 / 2
		Allied IV/(GE)	UMAA301	Business Statistics		6	4
		VE/(SEC)		Environmental Science		2	1
					TOTAL	**30**	**22/23**
IV	III	Core IX/(DSC)	UCOM407	Banking Law & Practice	UCOM201	4	4
		Core X/(DSC)	UCOM408/ UCCM408	Corporate Accounting	UCOM304/ UCCM304	5	4
		Core XI/(DSC)	UCOM409/ UCCM409	Business Law	UCOM302/ UCCM302	5	4
		Core XII/(DSC)	UCOR413/ UCCR411 UIAR404	Industry Interface Programme II – Stock Market & Mutual Fund	UCOR411	1	1
		Core XIII/(DSC)	UCOM412 / UCCM412	Security Analysis & Portfolio Management	---	4	3
		Allied V/(GE)	UCSA409	Business Analytics and Intelligence	UCSA509	3	3
		Allied Practical I/(GE)	UCSR415	Business Analytics and Intelligence using SAS – Lab	UCSR512	3	2
	IV	Soft Skills/(SEC)		Personality Development		2	1
		NME/(SEC)				3	2
	V	Extension Activity Physical Education				-	0 / 2
					TOTAL	**30**	**24/26**
		Core XIV /(DSC)	UCOM506/ UCCM506	Company Law	UCOM503/ UCCM503	6	4

V	III	Core XV/ (DSC)	UCOO501/ UCCO501/ UIAO501	Total Quality Management/ Human Resource Management0	--	6	5
		Core XVI/ (DSC)	UCOM509/ UCCM509 UIAM503	Income Tax Law & Practice I	UCOM502/ UCCM502	5	4
		Core XVII/(DSC)	UCOM510/ UCCM510/ UIAM504	Accounting Package	UCOM604/ UCCM604	3	2
		Core Practical I	UCOR501/ UCCR501/ UIAR501	Accounting Package – Lab	UCOR605/ UCCR605	3	3
		Core XVIII/ (DSC)	UCOP501/ UCCP501/ UIAP501/ UCOM511/ UCCM511 UIAM511	Project/Principles and Practice of Insurance	---	5	5
	IV	VE/(SEC)				2	1
					TOTAL	**30**	**24/24**
VI	III	Core XIX/ (DSC)	UCOM612/ UBAM609/ UIAM601	Women Entrepreneurship	---	5	5
		Core XX/ (DSC)	UCOM614/ UCCM614/ UBAM610	Financial Management	UCOM613/ UCCM613/ UBAM610	6	5
		Core XXI/ (DSC)	UCOR618/ UCCR618/ UIAR603	Industry Interface Programme III - GST Practical	UCOR615/ UCCR615	1	1
		Core XXII/(DSC)	UCCM616/ UCOM616/ UIAM604	Goods and Services Tax	---	6	5
		Core XXIII/ (DSC)	UCOM617/ UCCM617/ UIAM605	Service Marketing	---	5	5
		Viva Voce	UCOM607/ UCCM607/ UIAM606	Comprehensive Viva	---	-	1
		Major Elective/ (DSE)	UCOO606/ UCCO606/ UIAO608	Logistics Management	---	5	4
			UCOO606/ UCCO606/ UIAO608	2. Income Tax Law & Practice II	UCOM602/ UCCM602		
			UCOO607/ UCCO607/ UIAO609	3. Consumer Protection	---		
	IV	SS/(SEC)				2	1
	V	Extension Activity/ Physical Education				-	0/2
					TOTAL	**30**	**27/29**
					GRAND TOTAL	**192**	**148/158**

NON MAJOR ELECTIVE

(These Courses Are Offered to All Major Except B.Com. B.Com. CA, BBA and BCA

Semester	Category	Course Code	Course Title	Contact/ Week	Credits	
					Min	Max
II	Non Major Elective – I /(SEC)	UCCE202/ UCOE202 UIAE202	Individual Tax Planning	4	2	2
IV	Non Major Elective – II /(SEC)	UCOE401/ UCCE401 UIAE401	Women Entrepreneurial Development	4	2	2

DEPARTMENT OF COMMERCE WITH COMPUTER APPLICATION

PREAMBLE

UG : Programme Profile and Syllabi of Courses Offered in Semester I & II along with III & IV Evaluation Components (with Effect From 2021 – 2024 Batch Onwards) are Presented In This Booklet.

PROGRAMME PROFILE: B.Com. (CA)
(Learning Outcome Based Curriculum Framework (LOCF)

Programme Specific Outcomes (PSO)

Upon Completion of the Programme, the Students will be Able to

- Understand The Concept Of Accounting And Computer Application In Business.
- Analyze Latest Technologies To Solve Problems In The Areas of Computer Application.
- Apply The Knowledge Of Accounting Fundamentals and Accounting Specialization In Business.
- Develop Accounting and E- Entrepreneurial Skills.

Semester	Part	Category	Course Code	Course Title	Previous Course Code	Contact / Week	Credit Min/Max
I	I	Part I Languages/ AECC-1I	UTAL107/ UTAL108 UHIL102/ UFRL102	Basic Tamil – I/ Advanced Tamil – I/ Hindi –I/ French – I/	UTAL103/ UTAL104/	5	3 / 4
	II	Part II Languages/ AECC-1	UENL109/ UENL110	English for Communication I (Stream – I) English for Communication II (Stream – II)	UENL106	5	3 / 4
	III	Core I/(DSC)	UCCM102/ UCOM104	Financial Accounting	UCOM103/ UCCM101	6	5
		Allied I/(DSC)	UCSA105	Multimedia	UCSA303	3	2
		Allied Practical I/(GE)	UCSR111	Multimedia Lab	UCSR306	3	2
		Allied II/(GE)	UMAA112	Business Mathematics		6	4
		PE	UPEM101	Professional English I	--	6	4
	IV	Value Education/(SEC)		Family Life Education		2	1
					TOTAL	**36**	**25/27**
II	I	Part I Languages/ AECC-1I	UTAL207/ UTAL208/ UFRL202/ UHIL202	Basic Tamil – II/ Advanced Tamil –II/ French – II/Hindi –II	UTAL205/ UTAL206/	5	3 / 4
	II	Part II Languages/ AECC-1	UENL209/ UENL210	English for Communication I (Stream – I) English for Communication II (Stream – II)	UENL206	5	3 / 4
	III	Core II/(DSC)	UCCM203/ UCOM204	Business Correspondence	---	5	4
		Allied III/(GE)	UCSA205	C Programming	UCSA104	3	2
		Allied Practical II/(GE)	UCSR208	C Programming – Lab	UCSR110	3	2

		Core III/(DSC)	UCCM206/ UCOM206	Management Accounting	UCOM507/ UCCM507/ UBAM408	5	5
II		Core IV/(DSC)	UCCR206/ UCOR206/ UIAR203	Industry Interface Programme I – Banking and Insurance	UCCR205	1	1
		PE	UPEM201	Professional English II		6	4
	IV	NME/(SEC)				3	2
	V	Extension Activity/ Physical Education				-	1 / 2
					TOTAL	**36**	**28 /31**
III	III	Core V/(DSC)	UCCM305 /UCOM305	Cost Accounting	UCCM501	5	4
		Core VI/(DSC)	UCCM306/ UCOM306/ UBAM308	Marketing Management	UCCM606	4	4
		Core VII/(DSC)	UCCM308/ UCOM308	Accounting for Non - Trading Concerns	---	4	4
		Online		NPTEL/ Spoken Tutorial	---	3	1 / 2
		Allied IV/(GE)	UCSA306	Object Oriented Programming	UCSA204	3	3
		Allied Practical III/(GE)	UCSR310	Object Oriented Programming – Lab	UCSR207	3	2
		Allied /(GE)	UMAA309	Business Statistics	UMAA403	6	4
	IV	Value Education/(SEC)		Environmental Science		2	1
					TOTAL	**30**	**23/24**
IV	III	Core VIII/(DSC)	UCCM405	e-Banking	---	4	3
		Core IX/(DSC)	UCCM408/ UCOM408	Corporate Accounting	UCCM304	5	4
		Core X/(DSC)	UCOM409/ UCCM409	Business Law	UCCM302	5	4
		Core XI/(DSC)	UCCR411/ UCOR413/ UIAR404	Industry Interface Programme II – Stock Market and Mutual Fund	UCCR410	1	1
		Core XII/(DSC)	UCOM412 / UCCM412	Security Analysis & Portfolio Management	---	4	3
		Allied V/(GE)	UCSA408	Fundamentals of Block Chain Technology	UCSA305	3	3
		Allied Practical IV/(GE)	UCSR414	Block Chain Technology using Solidity – Lab	UCSR309	3	2
	IV	NME/(SEC)				3	2
		Soft skills/(SEC)		Personality Development		2	1
	V	Extension Activity/ Physical Education				-	0 /2
					TOTAL	**30**	**23/25**
		Core XIII/(DSC)	UCOO501/ UCCO501/ UIAO501	Total Quality Management	--	6	4
				Human Resource Management			

		Core XIV/(DSC)	UCCM509/ UCOM509/ UIAM503	Income Tax Law & Practice–I	UCCM502	5	4
V	III	Core XV/(DSC)	UCCM510/ UCOM510/ UIAM504	Accounting Package	UCCM604	3	2
		Core Practical I	UCOR501/ UCCR501/ UIAR501	Accounting Package – Lab	UCCR605	3	3
		Allied VI/(GE)	UCSA510	Digital Marketing Analytics	UCSA406	3	3
		Allied Practical V/(GE)	UCSR513	Web Design using Microsoft Expression web4 – Lab	UCSR412	3	2
		Core XVI/(DSC)	UCOP501 UCCP501/ UIAP501/ UCOM511/ UCCM511 UIAM511	Project / Research Methodology	---	5	5
	IV	Value Education/(SEC)				2	1
					TOTAL	**30**	**24/24**
VI	III	Core XVII/ (DSC)	UCCM615	E- Entrepreneurship	---	5	3
		Core XVIII/ (DSC)	UCCM614/ UCOM614/ UBAM610	Financial Management	UCOM613/ UCCM613/ UBAM610	6	5
		Core XIX/(DSC)	UCCR618/ UCOR618/ UIAR603	Industry Interface Programme III – GST Practical	UCCR615/ UCOR615	1	1
		Core XX/(DSC)	UCCM616/ UCOM616/ UIAM604	Goods and Services Tax	---	6	5
		Core XXI/(DSC)	UCCM617/ UCOM617/ UIAM605	Service Marketing	---	5	5
		Viva Voce	UCCM607/ U COM607/ UIAM606	Comprehensive Viva	--	--	1
		Major Elective/(DSE)	UCOO606/ UCCO606/ UIAO608	1. Logistics Management	---	5	4
			UCCO606/ UCOO606/ UIAO608	2.Income Tax Law & Practice - II	UCCM602		
			UCCO607/ UCOO607/ UIAO609	3. Consumer Protection	---		
	IV	Soft skills/(SEC)				2	1

	V	Extension Activity/ Physical Education				-	0/2
					TOTAL	**30**	**25/27**
					GRAND TOTAL	**192**	**148/158**

UG COURSES OFFERED TO OTHER DEPARTMENTS

Semester	Category	Course Code	Department	Course Title	Contact / Week	Credit	
						Min	Max
II	Allied/(GE)	UCOA203/ UCOR203	BBA	Accounting Package	2	2	2
				Accounting Package – Lab	3	2	2
III	Allied III/(GE)	UCOA303	BCA ISM	Financial Accounting	6	5	5
IV	Allied IV/(GE)	UCOA403/ UCOR403	BCA ISM	Accounting Package	2	2	2
				Accounting Package – Lab	3	3	3

NON MAJOR ELECTIVE

(These Courses are Offered to All Major Except B.Com. B.Com. CA, BBA and BCA)

Semester	Category	Course Code	Course Title	Contact/ Week	Credit	
					Min	Max
II	Non Major Elective – I /(SEC)	UCCE202/ UCOE202 UIAE202	Individual Tax Planning	4	2	2
IV	Non Major Elective – II /(SEC)	UCOE401/ UCCE401 UIAE401	Women Entrepreneurial Development	4	2	2

EXTRA CREDIT EARNING PROVISIONS

Semester	Category	Course Code	Course Title	Contact/ Week	Credit	
					Min	Max
IV	Core XXVII/ XXV	UCOI401/ PCOI401	Summer Internship	-	-	2

SELF STUDY

Semester	Course code	Course Title	Contact /Hours	Credit	
				Min	Max
V	UCOS501/ UCCS501	Business Ethics and Corporate Governance			
	UCOS502/ UCCS502	Business Analysis	-		1

EXPERIENTIAL LEARNING (Only For Interested Students)

Semester	Category	Course Title	Contact/ hours	Credit	
				Min	Max
II	Core XXVIII/ XXVI /(DSC)	Accounting Package	-	1	1

Related Paper / Course Code	**Work Experience**			**Collaborating Agency**	**Mode of Evaluation**
	Nature of Institution	**Proposed Duration of Training**	**Proposed Period**		
Accounting Package UCOM510/UCCM510/ UCOM203/ UCCM202	ICAT Tally Training Institution, Puducherry	5 Days	February	ICAT Tally Training Institute, Puducherry	Written Test

FINANCIAL ACCOUNTING

UCOM104/UCCM102

Semester	**: I**	**Credit**	**: 5**
Category	**: Core I / (DSC)**	**Hours/Week**	**: 6**
Class & Major	**: I B.Com and I B.Com (CA)**	**Total Hours**	**: 78**

Objectives:

To Enable the Students

- Understand the Basic Rules of Accounting and Accounting Principles.
- Convert Single Entry System Into Systematic Accounting
- Maintain Accounts For Different Types of Organizations, Branch and Departments

Learning Outcomes:

On Completion of This Course, the Students will be able to

- Prepare Trading, Profit & Loss Account and Balance Sheet.
- Prepare Branch Accounts, Departmental Accounts and Partnership Accounts.

UNIT I INTRODUCTION TO ACCOUNTING **16 Hour**

Meaning and Scope of Accounting, Basic Accounting Concepts and Conventions – Objectives of Accounting - Accounting Transactions - Double Entry Book Keeping - Journal, Ledger, Preparation of Trail Balance - Final Accounts with Adjustments.

UNIT II SINGLE ENTRY SYSTEM **16 Hour**

Single Entry – Meaning, Features, Defects, Difference between Single Entry & Double Entry System – Statement of Affairs Method- Conversation Method (Only Simple Problems)

UNIT III BRANCH & DEPARTMENTAL ACCOUNTS **16 Hour**

Branch Accounts – Dependent Branches – Debtors System – Stock & Debtors Systems – Independents Branch (Excluding Foreign Branch) Departmental Accounting – Basis For Allocation of Expenses – Inter Departmental Transfer At Cost Or Selling Price – Treatment of Expenses Which Cannot Be Allocated.

UNIT IV HIRE PURCHASE SYSTEM **14 Hour**

Hire Purchase System – Calculation of Interest – Default and Repossession – Hire Purchase Trading Accounts

UNIT V PARTNERSHIP ACCOUNTS **16 Hour**

Partnership Accounts –Admission – Retirement, Death, Dissolution & Insolvency of Partners (Garner Vs Murray) **Note: Problem: 80%, Theory: 20%**

Text Books

- Gupta R.L. And Gupta V.K. (2020) *Financial Accounting.* Sultan Chand Publication. New Delhi.
- Reddy T.S. And Murthy A. (2020) *Financial Accounting.* Margham Publication. Chennai.

Reference Books

- Gupta R.L and Radhaswamy. (2020)*Advanced Accounting.* Volume – I. Sultan Chand. New Delhi.
- Jain And Narang (2020) *Financial Accounting.* Kalyani Publishers. Chennai.
- Shukla And Grewal, (2020) *Advanced Accounting*, S. Chand Publications, New Delhi.

E-Resources

- https://www.icai.org/post.html?post_id=16950
- https://icmai.in/upload/Students/Syllabus2016/Inter/Paper-5-April-2021.pdf

BUSINESS ECONOMICS
UCEA102

Semester	**: I**	**Credit**	**: 4**
Category	**: Allied**	**Hours/Week**	**: 6**
Class & Major	**: I B.Com**	**Total Hours**	**: 78**

Objectives

To enable the students

- Analyze the Economic Problem related to Business Decisions.
- Apply the Knowledge of Economic theory to the Business problems.

Learning outcomes

On completion of this course, the students will be able to

- Forecast Demand for goods.
- Determine Break Even Price.
- Make Capital Budgeting decisions.

UNIT I INTRODUCTION **15 Hour**

Definition- Nature and Scope of Business economics – Importance – Decision Making in Business – Objectives of Business Firms – Social Responsibilities of Business – Role and Responsibilities of Business Economist.

UNIT II LAW OF DEMAND **15 Hour**

Demand Analysis : Meaning – Demand determinants – Law of Demand- Elasticity of Demand: Types & Importance of Elasticity of demand- Deman forecasting: Meaning – Methiods og demand forecasting – Demand forecasting methods for the new products – Criteria for a good forecasting method.

UNIT III COST, REVENUE AND BREAK EVEN ANALYSIS **16 Hour**

Money Cost – Real Cost – Implicit Cost and explicit Cost – opportunity Cost – Short run and Long run cost Curves Total Revenue – Average Revenue – Marginal Revenue – Relationship between AR and MR Curve – Some Special cases of Revenue Curves – Break Even Analysis – Determination of Break Even point – Uses - Assumptions – Limitations.

UNIT IV MARKET STRUCTURE AND PRICING METHODS **16 Hour**

Feature and Types of Market: Pricing under Perfect Competition – Meaning and Features of Monopoly, Monopolistic Competition and Oligopoly – Meaning and Objectives of Pricing Policy – Factors and Methods of Pricing.

UNIT V CAPITAL BUDGETING **16 Hour**

Meaning and Objectives of Capital Budgeting – Need for Capital Budgeting – Forms of Capital Budgeting – Nature of Capital Budgeting Problem – Project Profitability: Methods of Appraising project Profitability.

Text Books

- Sankaran.S.,*Business Economics*, Margham Publications, Chennai 2008.

Reference Books

- Dewett.K.K., Modern Economics Theory, 1998
- Agarwal.H.S., Advance Economic Theory, Konark Publication, 1998.
- Dacosta.G.C., Production Prices and Distribution, New Delhi, Tata McGaw Hill (1980).
- Eruce.N and eoad Way.R.,welfare Economics, Basil Bluckwell, Oxford, 1984.

BUSINESS CORRESPONDENCE

UCOM204/UCCM203

Semester	**: II**	**Credit**	**: 4**
Category	**: Core II/(DSC)**	**Hours /Week**	**: 5**
Class & Major	**: II B. Com. and II B.Com. CA**	**Total hours**	**: 65**

Objectives:

To enable the Students

- Acquire Knowledge in Modern Communication Forms.
- Understand Message Strategies and Formats Appropriate for Professional Communication Situations.
- Develop Effective Communication Skills by Overcoming Barriers to Communication.

Learning Outcomes:

On Completion of this Course, the Students will be able to

- Develop both Written and Oral Communication Skills to Produce Clear, Complete, Accurate Messages.
- Prepare Different Types of Business Letters, Reports and Business Correspondence

UNIT I INTRODUCTION **12 Hour**

Communication – Definition, Significance and Types – Principles of Effective Communication – Barriers to Communication – Business Letter – Layout.

UNIT II BUSINESS LETTERS **15 Hour**

Kind of Business Letters – Interviews – Appointment – Acknowledgement – Promotion – Enquiries - Replies – Orders – Sales – Circular Letters – Complaints.

UNIT III BANKING CORRESPONDENCE **12 Hour**

Bank Correspondence – Company Correspondence - Correspondence With Shareholders, Directors.

UNIT IV OFFICE CORRESPONDENCE **13 Hour**

Reports-Types of Reports - Report Writing – Agenda - Minutes of Meeting – Preparation of Memorandum – Office Order – Circulars – Notification.

UNIT V MODERN FORMS OF COMMUNICATION **13 Hour**

Modern Forms Of Communication – Fax – E-Mail – Video Conferencing – Internet – Websites And Their Use In Business.

Text Books

- Rajendra Pal (2020) *Essentials Of Business Communication.* New Delhi, Sultan Chand & Sons.
- Ramesh And Patten Shetty (2019) *Effective Business Communication.* S. Chand & Co. New Delhi.

Reference Books

- Bovee, Thill (2020) *Business Communication Today.* Pearson Education Private Ltd. New Delhi.
- Mary Ellen Guffey (2020) *Business Communication.* International Thomson Publishing. New Delhi.

E-Resources

- https://staffold.najah.edu/sites/default/files/Oxford%20Handbook%20of%20Commercial%20Correspondence.pdf
- https://www.icai.org/post/sm-foundation-p2-sec-b-may2021onwards

MANAGEMENT ACCOUNTING

UCOM206/UCCM206

Semester	**: II**	**Credit**	**: 05**
Category	**: Core III/(DSC)**	**Hours/Week**	**: 05**
Class/Major	**: I B.Com/B.Com C.A**	**Total hours**	**: 65**

Objectives:

To Enable the Students

- Gain Knowledge of the Basic Concepts of Management Accounting.
- Analyze and Interpret the Financial Statements using Ratio Analysis.
- Develop Accounting Skills to take Managerial Decisions.

Learning Outcomes:

On Completion of This Course, the Students will be able to

- Prepare Comparative Statement and Common Size Statement.
- Prepare Cash Flow Statement and Fund Flow Statement
- Prepare Different Types of Budgets for the Business.

UNIT I INTRODUCTION TO MANAGEMENT ACCOUNTING 12 Hour

Management Accounting – Meaning, Scope, Importance and Limitations – Management Accounting Vs. Cost Accounting – Management Accounting Versus Financial Accounting.

UNIT II ANALYSIS AND INTERPRETATION OF FINANCIAL STATEMENT 13 Hour

Financial Statement – Nature, Objectives and Tools– Methods– Comparative Statements, Common Size Statement – Trend Analysis

UNIT III RATIO ANALYSIS 13 Hour

Ratio Analysis – Benefits and Limitations, Classification of Ratios – Liquidity, Solvency, Profitability and Turnover Ratios

UNIT IV FUND FLOW& CASH FLOW ANALYSIS 12 Hour

Fund Flow and Cash Flow Statement – Differences – Advantages – Limitations - Conversion Method Only.

UNIT V BUDGETARY CONTROL AND MARGINAL COSTING 15 Hour

Budgets and Budgetary Control – Meaning, Objectives, Merits And Demerits – Types Of Budgets – Production, Cash And Flexible Budget, Marginal Costing (Excluding Decision Making) – Absorption Costing And Marginal Costing – Cvp Analysis – Break Even Analysis And Break Even Chart. **Note-Theory – 30%, Problems – 70%**

Text Books

- Srinivasan N.P (2020) *Management Accounting.* Sterling Publishers Ltd. New Delhi.
- Reddy & Murthy (2019) *Management Accounting.* Margham Publications. Chennai.
- Maheswari S.N. (2020) *Cost And Management Accounting.* Sultan Chand & Sons. New Delhi.

Reference Books

- Jain And Narang (2020) *Cost And Management Accounting.* Kalyani Publications. New Delhi.
- Pillai.R.S.N And Bhagirathi (2018) *Management Accounting.* S.Chand & Co. Ltd. New Delhi.
- *Khan And Jain.(2020)Management Accounting*. Tata Mcgraw-Hill Education. New Delhi.

E- Resources

- www.pondiuni.edu.in/storage/dde/downloads/finiii_ma.pdf
- www.ddegjust.ac.in/studymaterial/mcom/mc-105.pdf

INDIAN ECONOMIC DEVELOPMENT

UCEA201

Semester : II **Credit : 4**
Category : Allied II **Hours/Week : 6**
Class & Major : I B.Com and I B.Com (IAT) **Total Hours : 78**

Objectives

To enable the students

- Understand the most important issues in the Indian Economy.
- Gain Knowledge on Liberalization, privatization and Globalization Policies.

Learning Outcomes:

On completion of this course, the students will be able to

- Analyze the Impact of Liberalization, Privatization and Globalization Policies on Indian Economy.
- Compare the Public and Private Sectors.

UNIT I FEATURES OF INDIAN ECONOMY 15 Hour

Meaning of Economic development AND Economic growth – Basic Characteristics of the Indian Economy as a Developing Economy – Major issues of Development – Determinant of Development and growth – Economic and Non Economic Growth Factors – Stages of Economic Development – Rostow's Stage of Economic Growth**.**

UNIT II INDIAN ECONOMY SINCE INDEPENDENCE 15 Hour

Economic Development Since Independence – Industrial _ Agricultural Sector, Social and Infrastructure – Basic Structure – Sectoral Contributions to GDP and Employment - Rural an Urban Economics – Services Sector – Role of five Year Plans.

UNIT III ECONOMIC CRISS AND REFORMS 16 Hour

Economics Crisis and its Causes –Consequences of Economic Crisis – Impact of Economic Crisis: on Agricultural Sector, Financial Sector and Employment – Economic Reforms: LPG.

UNIT IV PRIVATISATION AND ECONOMIC REFORMS 16 Hour

Performance Analysis of Public Sector – Comparison of the Public and Private Sector – Meaning and scope of Privatization - Economic Reforms in India Attempts of Privatization of in India Disinvestment.

UNIT V LIBERALIZATION, GLOBALIZATION AND ITS IMPACT OF INDIA 16 Hour

Globalization: Meaning and origin – WTO – Globalization and its Impact on India – its advantages – the Need for Policy Frame Work Liberalization: Meaning and scope – Impact of Liberalization in India. (Global Economic Crisis and its impact – Current issues in Indian Economics : Mini Project, Term paper, Quiz, Presentation).

Text Books

- Datt.R and Sundaram.K.P.M., Indian Economy, S. Chand and Company Ltd, New Delhi, 2009.

Reference Books

- Dhingra.I.C., The *Indian Economy*, New Delhi, Sultan Chand and Co,2009.
- Mishra and Puri.,Economics of *Development and planning*, New Delhi, Himalayas Publishing Sources,2009.

INDUSTRY INTERFACE PROGRAMME I – BANKING AND INSURANCE

UCOR206/UCCR206/ UIAR203

Semester: II **Credit : 1**
Category: Core IV/(DSC) **Hours /Week : 1**
Class & Major : I B.Com., I B.Com. CA & I B.Com. IAT **Total hours : 13**

Objectives:

To Enable the Students

- Fill-Up Forms Used in Banks, Insurance Companies and other Business Units.
- Acquire Knowledge on Documentation Procedure.

Learning Outcomes:

On Completion of this Course, the Students will be able to

- Draft Application for Availing any Banking and Insurance Services.
- Draft Banking Correspondence and Insurance Correspondence.

II Semester: Training will be given to fill up the following Forms/ Formats/ Challans -List of Items used in the Day to Day Banking

1. Application Forms For Opening Bank Accounts, Cheque Book, Pass Book, Bank Statement
2. Format Of Demand Draft
3. Cheque, Truncated Cheque, Travellers Cheque
4. Pay-In- Slip Form
5. Deposits – All Types (All Forms / Challans /Formats)
6. Loans – All Types (All Forms / Challans /Formats)
7. All Financial Services (Foreign Exchange Remittances By Banks, Money Exchanges/ Western Money and Bancassurance Etc. – (All Forms /Challans)

8. E-Banking Services – (All Forms / Challans /Formats)
9. Withdrawal Form
10. NEFT/ RTGS Form
11. Insurance Policy Document
12. Life Insurance & General Insurance Documents
13. Challans Of Non-Banking Finance Companies

Evaluation Pattern for Industry Interface Programme

CIA	60 Marks
Daily Practical Assessment	30 Marks
Test I	10Marks
Viva I	05Marks
Test II	10Marks
Viva II	05Marks
ESE	**40 Marks**
Record	10 Marks
Practical Exam	20Marks
Viva Voce	10Marks

Total 100 Marks
(Students will Be Given Blank Forms to Fill-Up

INDIVIDUAL TAX PLANNING

UCOE201

Semester : II **Credit : 2**
Category : Non-Major Elective I/(SEC) **Hours/Week : 3**
Class : I UG **Total Hours : 52**

Objectives:

To Enable the Students

- Gain Basic Knowledge About Concepts of Income Tax Act In India.
- Familiarize The Different Heads of Income With Its Components
- Build An Idea About Income From House Property As A Concept
- Compute The Income From Capital Gain And Other Sources.

Learning Outcomes:

On Completion of this Course, the Students will be able to

- Compute the Total Income and Tax Liability of Individual Assesses
- Apply Income Tax Provisions for Tax Planning

UNIT I INTRODUCTION TO INCOME TAX **10 Hour**

Basic Concepts – Person-Assessment Year – Previous Year – Permanent Account Number – Basis of Charge – Schedules of Rates of Tax – Exempted Incomes.

UNIT II INCOME FROM SALARY, INCOME FROM HOUSE PROPERTY **10 Hour**

Computation of Salary – Types of Allowances – Types of Perquisites – Profit in Lien of Salary – Deductions. - Computation of Income From House Property.

UNIT III PROFITS & GAINS OF BUSINESS OR PROFESSION, CAPITAL GAINS 11 Hour

Computation of Profits and Gains of Business or Profession - Computation of Short Term Capital Gains – Long Term Capital Gains – Deductions.

UNIT IVINCOME FROM OTHER SOURCES, TAX DEDUCTIONS 11 Hour

Computation of Income From Other Sources -Tax Saving – Deduction U/S 80- Computation of Taxable Income and Tax Liability.

UNIT V TAX PLANNING 10 Hour

Tax Planning – Tax Evasion – Tax Avoidance – Types Of Assessment – Filing Of Income Tax Returns – Penalty – Appeal. **Note: Theory 20% and Problem 80%**

Text Books

- Gaur, V.P. And Narang, D.B. (2020).*Income Tax Law & Practice.* Kalyani Publishers. Ludhiana.
- Hariharan, T.(2020). *Income Tax*. Vijay Nichole Imprint Pvt. Ltd. Chennai.

Reference Books

- Singhania, V.K. (2020)*Students Guide To Income Tax.* Taxmann Publication Pvt. Ltd. New Delhi.
- Dinkar And Pagre.(2020).*Income Tax Law & Practice.* Sultan Chand & Sons. New Delhi.

E-Resources

- https://incometaxindia.gov.in
- https://www.taxmann.com › research › direct-tax-laws

UG III & IV EVALUATION COMPONENTS OF CIA

Semester	Category	Course Code	Course Title	Component III	Component IV
I	Core I/ (DSC)	UCOM104/ UCCM102/ UCOA303	Financial Accounting	Financial Statement Analysis	Problem Solving
II	Core II/ (DSC)	UCOM204/ UCCM203	Business Correspondence	Album Making	Poster Presentation
	Core III/ (DSC)	UCOM206/ UCCM206/ UCOM507/ UCCM507	Management Accounting	Problem Solving	Financial Performance Reporting

UG EVALUATION COMPONENTS OF CIA -NON MAJOR ELECTIVE

Semester	Category	Course code	Course Title	Component III	Component IV
II	NME I/ (SEC)	UCCE201/ UCOE201 UIAE201	Individual Tax Planning	Written Quiz	Problem Solving
IV	NME I / (SEC)	UCOE401/ UCCE401 UIAE401	Women Entrepreneurial Development	Assignment	Album Making
IV	NME I/ (SEC)	UCCE402/ UCOE402 UIAE402	Internet Banking	Banking Practice	Assignment

DEPARTMENT OF COMMERCE WITH INTERNATIONAL ACCOUNTING & TAXATION

PREAMBLE

UG: Programme Profile and Syllabi of Courses Offered in Semester III & IV along with III &IV Evaluation Components (With Effect From 2021 – 2024 Batches Onwards) arePresented in This Booklet.

PROGRAMME PROFILE: B.Com. International Accounting and Taxation (Learning Outcome Based Curriculum Framework (Locf)

Programme Specific Outcomes (PSO)

Upon Completion Of The Programme, the Students will be able to

- Understand the Prevailing International Accounting and Taxation Systems.
- Analyze the Practical Tools of Finance Required in Decision Making.
- Discuss International Financial Reporting Standards, why there is a Need for Convergence and the Status of These Standards Worldwide.
- Develop Accounting, Taxation, Entrepreneurial And Financial Management Skills.

Semester	Part	Category	Course Code	Course Title	Contact/ Week	Min/ Max
I	I	Part I Languages/ AECC-1I	UTAL107/ UTAL108 UHIL102/ UFRL102	Basic Tamil – I/ Advanced Tamil – I/ French – I/ Hindi – I	5	3 / 4
	II	Part II Languages/ AECC-1	UENL109/ UENL110	English for Communication I (Stream – I) English for Communication II (Stream – II)	5	3 / 4
	III	Core I/(DSC)	UIAM101	Organization Management	4	4
		Core II/(DSC)	UIAM102	Basics of Financial Accounting	4	4
		Core III/(DSC)	UIAM103	International Accounting	4	4
		Allied/(GE)	UMAA112	Business Mathematics	6	4
		PE	UPEM101	Professional English I	6	4
	IV	Value Education/(SEC)		Family Life Education	2	1
				TOTAL	**36**	**27/29**
II	I	Part I Languages/ AECC-1I	UTAL207/ UTAL208/ UFRL202/ UHIL202	Basic Tamil – II/ Advanced Tamil –II/ French – II/Hindi – II	5	3 / 4
	II	Part II Languages/ AECC-1	UENL209/ UENL210	English for Communication I (Stream – I) English for Communication II (Stream – II)	5	3 / 4
	III	Core IV/(DSC)	UIAM201	Principles of Management	5	4
		Core V/(DSC)	UIAM202	Basics of Cost Accounting	5	3
		Allied/(GE)	UCEA202	Indian Economic Development	6	4
	III	Core VI/(DSC)	UIAR203/ UCOR206 UCCR206	Industry Interface Programme I- Banking and Insurance	1	1

II		PE	UPEM201	Professional English II	6	4
	IV	Non Major Elective/(SEC)			3	2
	V	Extension Activity/ Physical Education			-	1 / 2
				TOTAL	**36**	**25/28**

III	III	Core VII/(DSC)	UIAM301	Management Accounting – I	5	4
		Core VIII/(DSC)	UIAM302	International Marketing	5	4
		Core IX/(DSC)	UIAM303	Global Financial Markets	5	4
		Core X/(DSC)	UIAM304	International Taxation	4	3
		Online course	-	NPTEL/ Spoken Tutorial	3	1
		Allied/(GE)	UMAA301	Business Statistics	6	4
		VE /(SEC)		Environmental Science	2	1
				TOTAL	**30**	**21/21**
IV	III	Core XI/(DSC)	UIAM401	Financial Reporting – I	5	4
		Core XII/(DSC)	UIAM402	Management Accounting –II	5	4
		Core XIII/(DSC)	UIAM403	Business Law	4	4
		Core XIV/(DSC)	UIAR404/ UCOR413 /UCCR411	Industry Interface Programme II – Stock Market & Mutual Fund	1	1
		Core XV/(DSC)	UIAM405	Financial Management – I	4	3
		Allied/(GE)	UCSA409	Business Analytics and Intelligence	3	3
		Allied/(GE)	UCSR415	Business Analytics and Intelligence using SAS –Lab	3	2
	IV	Non Major Elective/(SEC)			3	2
		Soft Skills/(SEC)		Personality Development	2	1
	V	Extension Activity Physical Education			-	-/2
				TOTAL	**30**	**24/26**
V	III	Core XVII/(DSC)	UCOP501 UCCP501/ UIAP501/ UCOM511 UCCM511/ UIAM511	Project / Company Law	6	4
		Core XVIII/(DSC)	UIAM502	Financial Management –II	6	5
		Core XIX/(DSC)	UIAM503/ UCOM509/ UCCM509	Income Tax Law & Practice - I	5	4
V	III	Core XX/(DSC)	UIAM504/ UCOM510/ UCCM510	Accounting Package	3	2
		Core XXI/(DSC)	UIAR501/ UCOR501/ UCCR501	Accounting Package – Lab	3	3

		Core XXII/(DSC)	UIAM505	Financial Reporting – II	5	5
	IV	Value Education/(SEC)			2	1
				TOTAL	**30**	**24/24**
VI	III	Core XXIII/(DSC)	UIAM601/ UCOM612 UBAM609	Women Entrepreneurship	5	5
		Core XXIV/(DSC)	UIAM602	Audit & Assurance	6	5
VI	III	Core XXV/(DSC)	UIAR603/ UCOR618/ UCCR618	Industry Interface Programme III – GST Practical	1	1
		Core XXVI/(DSC)	UIAM606/ UCCM616/ UCOM616	Goods and Services Tax	6	5
		Core XXVII/(DSC)	UIAM605/ UCOM617/ UCCM617	Service Marketing	5	5
VI	III	Viva Voce	UIAM606/ UCCM607/ UCOM607	Comprehensive Viva	-	1
		Major Elective/(DSE)	UCOO606/ UCCO606/ UIAO608	1. Logistics Management	5	4
			UIAO608/ UCOO606/ UCCO606	2. Income Tax Law & Practice - II		
			UIAO609/ UCOO607/ UCCO607	3. Consumer Protection		
	IV	Soft skills/(SEC)			2	1
	V	Extension Activity/ Physical Education			-	0/2
				TOTAL	**30**	**27/29**
				GRAND TOTAL	**192**	**148/157**

NON MAJOR ELECTIVE

Semester	Category	Course Code	Course Title	Contact/ Week	Credit	
					Min	Max
II	Non Major Elective – I /(SEC)	UCCE202/ UCOE202 UIAE202	Individual Tax Planning	4	2	2
IV	NME – I/(SEC)	UCCE402/ UCOE402 UIAE402	Internet Banking	4	2	2

These Courses are Offered To All Major Except B.Com. B.Com. CA, BBA & BCA

EXTRA CREDIT EARNING PROVISIONS

Semester	Category	Course Code	Course Title	Contact/ Week	Credit	
					Min	Max
IV	Core XXVII/ XXV/(DSC)	UCOI401/ PCOI401	Summer Internship	-	-	2

Experiential Learning (Only For Interested Students)

Semester	Category	Course Title	Contact/ hours	Credit	
				Min	Max
II/IV/V	Core XXVIII/ XXVI/(DSC)	Accounting Package	-	1	1

Related Paper / Course Code	Work Experience			Collaborating Agency	Mode of Evaluation
	Nature of Institution	Proposed Duration of Training	Proposed Period		
Accounting Package UCOM203/ UCCM202/ UCOA403/ UCOM510/UCCM510	Tally Training Institution	5 Days	February	ICAT, Puducherry	Written Test

ACCA Papers Incorporated in B.Com. (International Accounting & Taxation)

S.No.	Exemption/Exam	ACCA Papers	Papers Incorporated In B.Com. (IAT) Syllabus In The Name Of
1	Exempted Papers (Exemption From Writing ACCA Exam, However Students Have To Study It)	F1 – Accountant In Business	Organization Management (F1 – I) – UIAM101 Principles Of Management (F1 – II)- UIAM201
2		F2 – Management Accounting	Basics Of Cost Accounting (F2)- UIAM202
3		F3 – Financial Accounting	Basics Of Financial Accounting (F3)-UIAM102
4		F4 – Corporate & Business Law	Business Law (F4) – UIAM403
5		F5 – Performance Management	Management Accounting – I –(F5)- UIAM301 Management Accounting – II –(F5)- UIAM402
6		F6 – Taxation	Income Tax And Law & Practice I –(F6)- UIAM503 Goods And Service Tax – F6-UIAM606 Income Tax And Law & Practice II – (F6)- UIAO608 - (Major Elective Paper)
7	Exam Will Be Conducted During 3rd Year.	F7 – Financial Reporting	Financial Reporting – I – (F7)- UIAM401 Financial Reporting II – (F7)- UIAM505
8		F8 – Audit And Assurance	Audit And Assurance (F8) – UIAM602
9		F9 - Financial Management	Financial Management - I – (F9) – UIAM405 Financial Management – II - (F9) – UIAM502

MANAGEMENT ACCOUNTING - I

UIAM301

(This course is offered by ACCA, UK)

Semester : III **Credit : 4**
Category : Core VII/(DSC) **Hours/Week : 5**
Class : II B.Com IAT **Total Hours : 65**

Objectives:

To Enable the Students

- Gain Knowledge of the Advanced Concepts of Management Accounting.
- Analyze and Interpret the Financial Statements.
- Develop Accounting Skills to take Managerial Decisions.

Learning Outcomes:

On Completion of this Course, the Students will be able to

- Understand and Apply Modern Techniques of Management Accounting.
- Apply Decision Making Techniques in the Context of Resource Optimisation, Risk Mitigation
- and Promote Efficiency

UNIT I ADVANCED MANAGEMENT ACCOUNTING TECHNIQUES – 1 12 Hour

Activity-Based-Costing – use of Appropriate Cost Drivers – Calculation of Costs per Driver and per Unit – Comparing the ABC and Traditional Absorption Costing; Target Costing – Derive a Target Cost in Manufacturing and Service Industry – Suggestion on how a Target Cost Gap can be reduced.

UNIT II ADVANCED MANAGEMENT ACCOUNTING TECHNIQUES – 2 13 Hour

Life Cycle Costing – Costs Involved At Different Stages of Life Cycle – Benefits And Application of Life Cycle Costing; Throughput Accounting – Theory of Constraints – Calculation And Interpretation of Throughput Accounting Ratio (TPAR) – Application in a Multi-Product Entity; Environmental Accounting – Management of Environmental Costs – Accounting for Environment Costs

UNIT III DECISION MAKING TECHNIQUES 13 Hour

Understand and Apply the Concept of Relevant Costs – Determination Of Relevance with Regard to a Contextual Decision – Opportunity Costs – Cost-Volume-Profit (Cvp) Relationship – Calculate & Interpret Break-Even Point and Margin of Safety – Estimation of Target Profit in Single & Multi-Product Scenario – Resource Optimisation in Light of Limiting Factors – Single or Multiple Factors – Make or buy Decisions

UNIT V PRICING DECISIONS AND RISK ANALYSIS 12 Hour

Factors Affecting Pricing of Product or Services – Price Elasticity of Demand – Demand Equation – Calculate Optimum Selling Price with MR = MC Equation – Pricing Strategies Such as Skimming, Penetration, Differential, Cost-Plus Pricing - Uses And Benefits of Big Data and Data Analytics for Planning, Costing, Decision-Making And Performance Management - Challenges and Risks of Implementing and Using Big Data and Data Analytics in an Organization

UNIT V RISK ANALYSIS IN BUSINESS DECISIONS **15 Hour**

Understand the Risk and Uncertainty in Short Term and their Impact on Business Decisions - Apply Techniques of Maximax, Maximin and Minimax Regret – Use of Expected Value Technique – Decision Tree – Value of Perfect & Imperfect Information

Note-Theory – 30%, Problems – 70%

Text Books

- Srinivasan, N.P. (2019) *Management Accounting.* Sterling Publishers Ltd. New Delhi.
- Reddy And Murthy. (2020) *Management Accounting.* Margham Publications. Chennai.
- Maheswari , S.N. (2020) *Cost And Management Accounting.* Sultan Chand & Sons. New Delhi.

Reference Books

- Jain And Narang. (2020) *Cost And Management Accounting.* Kalyani Publications. New Delhi.
- Pillai, R.S.N And Bhagirathi. (2019.*Management Accounting.* S.Chand & Co. Ltd. New Delhi.
- Khan, M.Y. And Jain, P.K. (2020) *Management Accounting.* Tata Mcgraw Hill. New Delhi.

E- Resources

- https://www.saylor.org/site/textbooks/Managerial%20Accounting.pdf
- www.pondiuni.edu.in/storage/dde/downloads/finiii_ma.pdf
- www.ddegjust.ac.in/studymaterial/mcom/mc-105.pdf

INTERNATIONAL MARKETING

UIAM302

Semester : III **Credit : 4**
Category : Core VIII/(DSC) **Hours/Week : 5**
Class : II B.Com IAT **Total Hours : 65**

Objectives:

To Enable the Students

- Gain Awareness on International Marketing and Domestic Marketing.
- Gain Knowledge on International Marketing Strategies and Operations.
- Enhance Knowledge with Regard to International Trade Promotion.

Learning Outcomes:

On Completion of this Course, the Students will be able to

- Develop International Marketing Strategies for Consumer Products Firms, Industrial Products Firms and Services Firms.
- Decide the Appropriate way of Entering Chosen Foreign Markets.

UNIT I INTRODUCTION TO GLOBAL MARKETING 12 Hour

Nature of International Business - The Concept of Global Marketing – Importance, Growth and Benefits – Scope and Challenge of International Marketing – The Dynamic Environment of International Marketing. Case Study on International Brands.

UNIT II DEVELOPING GLOBAL MARKETING STRATEGIES 13 Hour

Global Marketing Management –Planning and Organisation – International Marketing Information System and Research – Understanding Global Consumers – Cultural Dynamics In Assessing Global Markets. Case Study on International Brands.

UNIT III INTERNATIONAL PRODUCT POLICY 13 Hour

Product Positioning in Foreign Market – Product Standardization and Adoption – Brands, Trademarks, Packaging and Labeling – International Marketing of Services – International Product Pricing Policy – Export Pricing –Pricing for International Markets. Case Study on International Brands.

UNIT IV INTERNATIONAL PROMOTIONAL POLICY 12 Hour

International Advertising – Developing International Advertising Strategy – International Sales Force and Their Management – Other Forms of Promotion for Global Markets. Case Study on International Brands.

UNIT V OVERSEAS MARKETING CHANNELS POLICY 15 Hour

Managing International Distribution Channels – Multinational Retailers and Wholesalers – Global Logistics – Contemporary Issues in International Marketing – Future Prospects In International Marketing. Case Study on International Brands.

Text Books

- Cherian, And Jacob. (2018) *Export Marketing.* Himalayan Publishing House. Chennai.
- Warnen, J. Keegan. (2019) *Global Marketing.* Prentice Hall of India.

Reference Books

- Varshney, R.L. And Bhattacharya, B. (2018) *International Marketing Management.* Sultan Chand & Sons. New Delhi.
- Hollensen, Svend. (2017) Global Marketing: A Decision-Oriented Approach. Prentice Hall. Harlow. England.
- Bradley Fran, J. (2018) *International Marketing Strategy.* Prentice Hall. Pearson Education: Harlow. England.

GLOBAL FINANCIAL MARKETS

UIAM303

Semester : III **Credit : 4**
Category : Core IX/(DSC) **Hours/Week : 5**
Class : II B.Com IAT **Total Hours : 65**

Objectives:

To Enable the Students

- Gain Knowledge on Foreign Exchange Market.
- Compare Domestic and International Money Market and Capital Market
- Gain Knowledge on International Banking Services.

Learning Outcomes:

On Completion of this Course, the Students will be able to

- Deal in Foreign Exchange Market, Money Market and Capital Market.
- Examine the Nature and Importance of the International Banking Business.

UNIT I INTRODUCTION TO GLOBAL FINANCIAL MARKETS 12 Hour

The Foreign Exchange Market - Comparison of Domestic and International Money and Capital Markets - Global Derivatives Market - The Mechanism of Foreign Exchange Transfers - Foreign Exchange and Eurocurrency Markets.

UNIT II INTERNATIONAL MONEY MARKET 13 Hour

Instruments Traded - Euro Currency Time Deposits - Euro Notes -- Banker's Acceptance - Floating Rate Notes - International Banking and Euro Currency Market - Syndication Technique.

UNIT III INTERNATIONAL CAPITAL MARKETS 13 Hour

Bond Market - Eurobonds and Foreign Bonds - Structure of International Bond Market - Yields And Proceeds Computation - Currency and Interest Rate Swaps - Determination of Swap Rates - Swaps Versus Long - Dated Forwards - Caps And Floors.

UNIT IV INTERNATIONAL EQUITY MARKETS 12 Hour

World's Major Stock Markets - Emerging Stock Markets -- International Equity Trading - - Diversification Benefits of International Investment - new issue Procedures - Private Placements -Hedging the Currency Risk of International Portfolios.

UNIT V INTERNATIONAL BANKING **15 Hour**

Services Offered by the Foreign Banks – Organisation Structure and Operations of Foreign Banks (As Affiliated Banks, Consortium Banks, Correspondent Banks Etc.) –Problems of Multinational Banks. Financial Intermediation – Maturity Transformation and Interbank Activity –International Trade Involving Letter of Credit-An Overview of Typical Transaction – Alternative Payment and Guaranteeing Procedure.

Text Books

- Jeevanandam, C. (2019) *Foreign Exchange Market.* Sultan Chand & Sons. New Delhi.
- Gurusamy, S. (2019) *Global Financial Institutions.* Tata Mcgraw Hill. New Delhi.
- Indian Institute of Banking & Finance. *International Banking*. Macmillan Publishers. New Delhi.

Reference Books

- Ian H.Giddy. (2019).*Global Financial Markets.* Houghton Mifflin & Co. Usa.
- John, R.Prick. Hkent Basker And John A Hasliem. (2017) *Financial Markets: Instruments And Concepts.* Reston Publishing Company. New York.
- Kaushik And Surendra, K. (2019).*International Capital Markets: New Directions.* New York Institute Of Finance.

INTERNATIONAL TAXATION

UIAM304

Semester : III **Credit : 3**
Category : Core X/(DSC) **Hours/Week : 4**
Class : II B.Com IAT **Total Hours : 52**

Objectives:

To Enable the Students

- Gain Basic Knowledge About International Tax Laws.
- Build An Idea About Double Taxation Avoidance Agreement
- Familiarize Transfer Pricing On International Transactions.

Learning Outcomes:

On Completion of This Course, the Students will be able to

- Apply International Tax Legislations for Tax Planning

UNIT I HISTORY OF INTERNATIONAL TAX LAW **10 Hour**

Work Under the League Of Nation-. Work of the OECD - Work of The UN Group of Experts- European Community Law and International Taxation- EC Law and Double Taxation Conventions- State Responsibility in International Taxation – The Development of the Concept of Harmful Tax Competition.

UNIT II BASIC PRINCIPLES OF INTERNATIONAL TAX LAW **10 Hour**

Jurisdiction to Tax: Limits on Tax Jurisdiction Arising from Public International Law. Taxes and Tax System: Federal Systems and Local Level Taxes. State Practice In Exercising Tax Jurisdiction: Concept of Source and Situs - Use of Residence – Domicile a Citizenship as Connecting Factors. State Practice in Determining Residence of Individuals and Corporations.

UNIT III CAUSES OF INTERNATIONAL DOUBLE TAXATION 11 Hour

Conflicts of Residence and Source. Conflicting Definitions of Connecting Factors. Other Causes of International Double Taxation (Including Particular Issues for Using Citizenship as a Connecting Factor for Taxation) - Methods of Relief From International Double Taxation: Relief by Credit- Including Indirect/ Underlying Credit and Tax Sparing Credit. Relief by Exemption Including Participation Exemption. Practical Difficulties in Applying Relief by Credit and Relief By Exemption -Relief by Deduction of Foreign Tax: Relief by Deferral.

UNIT IV INTERNATIONAL TAX AVOIDANCE 11 Hour

Tax Havens: Approaches to the Identification of Tax Havens – Black Lists, White Lists, Grey Lists – Work of The Oecd Forum on Harmful Tax Practices. Features of The Most Commonly Used Tax Havens. Domestic Law Approaches to International Tax Avoidance: Controller Foreign Company Legislation – Foreign Personal Holding Company Legislation – Examples From State Practice. Cfc Legislation and Double Taxation Conventions. Money Laundering Legislation and International Tax Avoidance.

UNIT V TRANSFER PRICING 10 Hour

Various Approaches to the Determination of Profits of Branches and Associated Enterprises: Unitary Taxation/Global Formulary Apportionment. Arm's Length Approaches. State Practice With Respect to Transfer Pricing: Consideration of Examples of Domestic Transfer Pricing Legislation. Transfer Pricing and Dtcs

Question Paper Pattern: Theory - 100 Marks.

Text Books

- Russo, R. Finnerty, C.J . Merks, And P. Pettricione, M.(2017). *Fundamentals of International Tax Planning.* Ibfd.
- Holmes Kevin. (2017). *International Tax Policy And Double Taxation Treaties.* Ibfd. Netherland.
- Baker Philip. (2017). *Double Taxation Conventions And International Tax Law.* Sweet & Maxwell. London.

Reference Books

- Ogley Adrian.(2019). *Principles of International Taxation: A Multinational Perspective,* Interfisc. Publishing. London.
- Rohatgi Roy. (2018).*Basic International Taxation – Volume* 1 *Principles.*Bna International, London.
- Vogel Klaus.(2020).*Double Taxation Conventions.* Kluwer Law International. London.
- Institute Of Chartered Accountants Of India. (2021) (Final) Study Material On International Taxation.

FINANCIAL REPORTING - I

UIAM401

(This course is offered by ACCA, UK)

Semester : IV **Credit : 4**
Category : Core XI/(DSC) **Hours/Week : 5**
Class : II B.Com IAT **Total Hours : 65**

Objectives:

To Enable the Students

- Understand The Various Accounting Standards That Are Applicable To Corporate Entities.
- Prepare Financial Statements For Individual Entities For The Use Of Stakeholders.

Learning Outcomes:

On Completion of this Course, the Students will be able to

- Understand The Use And Application of The IFRS And Ind AS
- Prepare Accounting Transactions Using Accounting Standards
- Analyse And Interpret Accounting Statements

UNIT I USE OF IFRS AND IND AS **13 Hour**

Understand The Application of IFRS in India Through the Use of Ind AS – The Applicability of Ind AS – The Mapping of Ind AS To IFRS – Differences Between IFRS & Ind AS – The List Of IFRS (Ind AS) – Process of Transition To IFRS For The First Time.

UNIT II APPLICATION OF IFRS (IND AS) FOR TRANSACTIONS **13 Hour**

Asset Based Standards Such As Property, Plant And Equipment (PPE) , Intangible Assets, Borrowing Costs, Impairment of Assets, Inventory and Biological Assets, Provisions & Contingencies, Events After Reporting Period, Accounting Policies, Estimates and Errors.

UNIT III REVENUE RECOGNITION **13 Hour**

Understand The Principles of Recognising Revenue of the Business – Revenue Recognition for Goods, Services, Interest and Dividends – Concept of Deferred Income and Accounting.

UNIT IV PREPARATION & PRESENTATION OF FINANCIAL STATEMENTS **13 Hour**

Preparation and Presentation Of Financial Statements by Incorporating the Effects of the Accounting Standards (Covered in Units 2& 3 Only) - Statement of Profit or Loss and other Comprehensive Income – Statement of Financial Position (Balance Sheet)

UNIT V ANALYSIS OF FINANCIAL STATEMENTS **13 Hour**

Analyse the Financial Performance of an Entity Using the Financial Statements – Use of Ratios in Performance Evaluation – Trend Analysis – Comparison with Competition or Industry Average.

Text Books

- Mukherjee, A And Hanif, M. (2020). *Financial Reporting and Financial Statement Analysis.* Mcgraw Hill. New Delhi.
- Dhamija Sanjay. (2020).*Financial Reporting and Analysis.* Sultan Chand & Sons. New Delhi.
- Parveen Sharma. (2020).*Financial Reporting.* Taxmann Publication (P) Ltd. New Delhi.
- Gauba, S. (2020).*Financial Reporting and Analysis.* Himalaya Publishing House. Mumbai.

Reference Books

- Tulsian, P.C. (2020). *Financial Reporting.* Sultan Chand & Co. New Delhi.
- Association of Chartered Certified Accountants. *(2020). Financial Reporting.* Kaplan Publication, UK.

MANAGEMENT ACCOUNTING - II

UIAM402

(This course is offered by ACCA, UK)

Semester : IV **Credit : 4**
Category : Core XII/(DSC) **Hours/Week : 5**
Class : II B.Com IAT **Total Hours : 65**

Objective:

To Enable the Students

- Gain Knowledge of The Advanced Concepts of Management Accounting
- Evaluate The Performance of A Company Using Budgetary Control and Standard Costing
- Analyse Financial and Non-Financial Performance of An Entity Using Performance Measurement Models

Learning Outcomes:

On Completion Of This Course, The Students Will Be Able To

- Understand and Apply Advanced Budgetary Control System and Standard Costing System.
- Apply Tools For Performance Management & Control In Private Sector And Not-For-Profit Organisation.
- Evaluate The Performance of A Business Division Using ROI And RI.
- Analyse Behavioural Considerations In Performance Management.

UNIT I ADVANCED BUDGETARY CONTROL AND STANDARD COSTING 12 Hour

Budgetary Systems in an Organisation Such as Top-Bottom, Bottom-Up, Rolling, Zero Based, Activity Based, Incremental Budgets – Preparation of Flexed Budgets – Beyond Budgeting Model – Employee Participation In Budgetary System – Quantitative Analysis Using High-Low Method, Applying Learning Curve Model

UNIT II STANDARD COSTING – VARIANCE ANALYSIS 13 Hour

Advanced Variance Analysis with the Help of Material Mix & Yield Variances, Sales Mix & Quantity Variances, Planning & Operational Variances – Performance Analysis with Variances – Assigning the Variances to the Managers

UNIT III PERFORMANCE ANALYSIS 13 Hour

Understand & Apply Financial & Non-Financial Performance Indicators (Fpis) – Using Norton's Balanced Scorecard Model and Fitzgerald & Moon's Building Block Model for Performance Measurement using Value-for-Money Approach for Not-for-Profit Organisations – Economy, Efficiency & Effectiveness Approach

UNIT –IVDIVISIONAL PERFORMANCE 12 Hour

Mechanism for Evaluating the Performance of a Business Division and the Divisional Managers Using Tools Such as Return on Investment (Roi), Residual Income (Ri) – Impact of Transfer Pricing on Divisional Performance – Methods of Setting Transfer Prices.

UNIT V BEHAVIOURAL CONSIDERATIONS 15 Hour

Need to Factor External Considerations in Performance Management Such as Environment, Market Conditions and Stakeholder Impact – Illustrate how Behavioural Aspects Affect the Performance of an Organisation- Information, Technologies and Systems for Organisational Performance- External Considerations and the Impact on Performance.

Note-Theory – 30%, Problems – 70%

Text Books

- Srinivasan ,N.P. (2019). *Management Accounting.* Sterling Publishers Ltd. New Delhi.
- Reddy And Murthy. (2020).*Management Accounting.* Margham Publications. Chennai.
- Maheswari, S.N. (2020). *Cost And Management Accounting.* Sultan Chand & Sons. New Delhi.

Reference Books

- Jain And Narang. (2020) Cost And Management Accounting. Kalyani Publications. New Delhi.
- Pillai,R.S.N And Bhagirathi,(2019) Management Accounting. S.Chand & Co. Ltd. New Delhi.
- Khan, M.Y. And Jain, P.K. (2020) Management Accounting. Tata Mcgraw Hill Education. New Delhi.

E- Resources

- https://www.saylor.org/site/textbooks/Managerial%20Accounting.pdf
- www.pondiuni.edu.in/storage/dde/downloads/finiii_ma.pdf
- www.ddegjust.ac.in/studymaterial/mcom/mc-105.pdf

BUSINESS LAW

UCOM409 / UCCM409 / UIAM403

(This course is offered by ACCA, UK)

Semester : IV	**Credit : 4**
Category : Core XII/ XI/XIII/DSC	**Hours/Week : 4**
Class : II B. Com., B.Com CA, B.Com. IAT	**Total hours : 52**

Objectives:

To Enable The Students

- Equip the Prospective Entrepreneurs (Businessmen) with Knowledge of Fundamental in Business Law
- Impart Basic Knowledge of Obligations Arising From Different Types of Contracts.
- Acquire Knowledge in Laws Relating To Special Contracts and Sale of Goods Act.
- Furnish Knowledge on Different Methods of Discharging Contracts.

Learning Outcomes:

On Completion of this Course, the Students will be able to

- Understand the Basic Concepts and Laws of Business.
- Understand the Basic Concepts of Transfer of Property Act

UNIT-I INTRODUCTION TO NATURE OF CONTRACT 11 Hour

Nature And Kinds of Contract – Offer And Acceptance – Consideration – Capacity of Parties – Free Consent – Legality of Object and Consideration, Void Agreement – Contingent Contracts.

UNIT II PERFORMANCE OF CONTRACTS 10 Hour

Performance of Contracts – Discharge of Contracts – Remedies for Breach Including Specific Performance – Quasi Contracts.

UNIT III SPECIAL CONTRACTS 11 Hour

Indemnity & Guarantee –Features and Distinctions-Extent of Surety's Liability-Rights and Discharge of Surety- Bailment & Pledge –Features-Difference-Rights and Duties of Bailor and Bailee / Pawnee-Pledge by Non-Owners.

UNIT IV SALE OF GOODS ACT 10 Hour

Sale of Goods Act 1930-Formation of Contract-Conditions and Warranties-Transfer of Property-Performance of Contract-Rights of an Unpaid Seller.

UNIT V CONTRACT OF AGENCY 10 Hour

Contract of Agency-Definition and Meaning – Creation-Ratification and Requisites-Rights of Principal and Agent-Relation of Principal with Third Parties-Personal Liability of Agent-Termination of Agency-Irrevocable Agency.

Text Books

- Kapoor, N. D. (2020).*Business Laws.* Sultan Chand & Son. New Delhi.
- Sreenivasan, M. R. (2018).*Business Law. Chennai.* Margam Publication.
- Paul Wetherly. (2020) *The Business Environment – Themes and Issues*, Oxford University Press.

Reference Books

- Kuchhal, M. C. (2020). *Mercantile Law.*Vikas Publication. New Delhi.
- Pillai, R. S. N.(2019). *Business Laws.* S.Chand. New Delhi.
- Shukla, M. C.(2020). *Mercantile Law.* S.Chand Co. New Delhi.

INDUSTRY INTERFACE PROGRAMME II – STOCK MARKET & MUTUAL FUND

UCOR413 / UCCR411 / UIAR404

Semester : IV	**Credit : 1**
Category : Core XIV/(DSC)	**Hours/Week : 1**
Class : II B.Com., B.Com CA, B.Com. IAT	**Total hours : 13**

Objectives:

To Enable the Students

- Fill-Up Forms Used in Stock Market and Mutual Fund Companies.
- Acquire Knowledge on Documentation Procedure.

Learning Outcomes:

On Completion of This Course, The Students will Be Able To

- Deal in Equity, Preference Share, Debenture and Bond
- Transfer, Transmit and Dematerialize Shares, Debentures and Mutual Fund Units

During IV Semester Training will be given to fill up the following forms used in Stock Market & Mutual Fund:

1. Application form for Equity / Preference Share
2. Share Certificate
3. Share Warrant
4. Application form for Bond / Debentures
5. Debenture Certificate
6. Scheme Information Document
7. Statement of Additional Information
8. Key Information Memorandum (KIM)
9. Mutual Fund Applications
10. Dematerialization Request Form – CSDL/NSDL
11. Rematerialization Request Form
12. Securities Transfer Form
13. Form for Transmission of Mutual Fund Units

Evaluation Pattern for Industry Interface Programme

CIA	60 Marks
Daily Practical Assessment	30 Marks
Test I	10Marks
Viva I	05Marks
Test II	10Marks
Viva II	05Marks
ESE	**40 Marks**
Record	10 Marks
Practical Exam	20Marks
Viva Voce	10Marks

(Students will be given blank forms to fill-up)

FINANCIAL MANAGEMENT- I

UIAM405 - (This course is offered by ACCA, UK)

Semester : IV **Credit : 3**
Category : Core XV/(DSC) **Hours/Week : 4**
Class : II B.Com. IAT **Total hours : 52**

Objectives:

To Enable the Students

- Understand of The Function of Financial Management In The Context of A Business Organisation
- Understand Different Functions of A Financial Manager In A Globalised Environment.

Learning Outcomes:

On Completion of this Course, the Students will be able to

- Understand The Purpose of Finance Function in an Organisation
- Understanding the Impact of Economic Environment on Financial Management
- Use Various Tools & Techniques for Working Capital Management
- Carry out Investment Appraisal

UNIT I ROLE & PURPOSE OF FINANCE FUNCTION 10 Hour

Financial Objective of a Business Organisation – Shareholder Value Maximisation V/S Profit Maximisation, Growth in Earning per Share, Total Shareholder Return – Possible Conflict between Stakeholder Objectives and Balancing Them– Linkage of Financial Objective With Corporate Strategy – Financial & Other Objectives of a Not-For-Profit Organisation.

UNIT II FINANCIAL MANAGEMENT ENVIRONMENT 10 Hour

Macroeconomic Environment of the Business – Role & Impact of Fiscal & Monetary Policies, Interest Rate & Exchange Rate Policies – Competition Policies – Nature & Role of Financial Markets Such as Capital Market, Money Market, Currency Market – Products In Capital Markets & Money Markets Such As Derivatives.

UNIT III WORKING CAPITAL MANAGEMENT **11 Hour**

Elements And Composition of Working Capital – Objective of Working Capital Management Through Balancing of Profitability V/S Liquidity – Cash Operating Cycle, Factors Influencing It And Computation Thereof – Management of Inventory Through EOQ, Inventory Levels, Availing Bulk Discounts, Early Payment Discounts And Just-In-Time (JIT) Techniques – Management of Receivables Through Credit Policy, Early Settlement Discounts, Extending Credit Period, Factoring & Invoice Discounting – Managing Accounts Payables Through Bulk Discounts, Early Payment Discounts – Managing Cash Using Baumol's Model and Millar-Orr Model – Working Capital Financing Strategies.

UNIT IV INVESTMENT APPRAISAL TECHNIQUES **11 Hour**

Types of Investment Projects Such as Mutually Exclusive Projects & Independent Projects - Use of Discounted Cash Flow (DCF) And Non-DCF Tools for Investment Appraisal – Payback Period & Discounted Payback – Return on Capital Employed (ROCE) – Net Present Value (NPV) and Internal Rate of Return (IRR) – Relative Merits & Demerits of These Methods – Project Risk Assessment Through Sensitivity Analysis.

UNIT V SPECIAL INVESTMENT DECISIONS **10 Hour**

Lease V/S Buy Decision – Replacement Cycle Decision – Use of the Equivalent Annual Cost Technique – Single Period Capital Rationing Including Computation of Project Ranking For Divisible & Non-Divisible Projects Using Techniques of Profitability Index & Trial & Error Method – Risk Adjusted Discount Rates.

Text Books

- Khan and Jain. (2020) *Basic Financial Management.* Tata Mcgraw Hill. New Delhi.
- Pandey, I.M. (2020) *Financial Management.* Vikas Publications. New Delhi.

Reference Books

- Rustagi. (2019) *Fundamentals of Financial Management.* Taxmann Publications. New Delhi.
- James, C. Van Horne, (2020) *Financial Management and Policy.* Pearson Education. UK.
- Levy, H. And Sarnat, M .(2020) *Principles of Financial Management.* Pearson Education. UK.

III & IV EVALUATION COMPONENTS OF CIA

Semester	Category	Course Code	Course Title	Component III	Component IV
III	Core VII/(DSC)	UIAM301	Management Accounting – I	Assignment	Problem Solving
	Core VIII/(DSC)	UIAM302	International Marketing	Case Study	Seminar
	Core IX/(DSC)	UIAM303	Global Financial Markets	Assignment	Seminar
	Core X/(DSC)	UIAM304	International Taxation	Assignment	Seminar
IV	Core XI/(DSC)	UIAM401	Financial Reporting – I	Assignment	Problem Solving
	Core XII/(DSC)	UIAM402	Management Accounting –II	Assignment	Problem Solving
	Core XIII/(DSC)	UIAM403	Business Law	Case Study	Seminar
	Core XV/(DSC)	UIAM405	Financial Management – I	Assignment	Problem Solving

PROGRAMME PROFILE: M.Com.
(Learning Outcome Based Curriculum Framework (LOCF)

PREAMBLE

PG : Programme Profile and the Syllabi of Courses Offered in Semester 1 and II along with III and IV Evaluation Components (with Effect From 2021-2023 Batch Onwards)

Programme Specific Outcomes (PSO)

- Upon Completion of the Programme, the Students will be able to
- Identify and use of Practical Tools of Finance Required in Decision Making.
- Assess Global Opportunities and Challenges For Business Growth.
- Analyzes Ethical Implications of Business Practices Using Advanced Levels Of Ethical
- Reasoning and Legal Implications
- Investigate Effectively The Research Tools, Apply Appropriate Tools and Draw Conclusion.

Semester	Category	Course Code	Course Title	Previous Course Code	Contact Hrs/ Week	Credits Min/ Max
I	Core I/(DSC)	PCOM102	Business Environment & Policy	-	6	4
	Core II/(DSC)	PCOM104	Financial Policies and Decision Making	-	6	4
	Core III/(DSC)	PCOM105	Strategic Management	-	6	4
	Core IV/(DSC)	PCOM107	Corporate Governance & Business Ethics	-	6	4
	Core V/(DSC)	PCOM108	Computerized Accounting	PCOM307/ PCAM311	2	2
	Core VI/(DSC)	PCOR109	Computerized Accounting – Lab	PCOR308/ PCOR312	3	2
	Library				1	-
				TOTAL	**30**	**20**
II	Core VII/(DSC)	PCOM202	Global Marketing	-	6	4
	Core VIII/(DSC)	PCOM207	Operation Research Methods	-	6	4
	Core IX/(DSC)	PCOM208	Advanced Accounting	-	6	4
	Core X/(DSC)	PCOM210	Derivatives and Risk Management	--	6	4
	Online Course	PONLM201	MOOCs	--	--	-/2
	NME - II/SEC				5	4
	Library				1	-
	Service Learning	PCOX201	Service Learning – Banking Practices	-	-	1
				TOTAL	**30**	**21/23**

III	Core XI/(DSC)	PCOM304	Service Marketing	-	6	5
	Core XII/(DSC)	PCOM305	Income Tax & International Taxation	-	6	6
	Core XIII/(DSC)	PCOM306	Contemporary Business Legislations	-	6	5
	Core XIV/AECC	PCOM307	Research Methodology	PCOM106	5	4
	Core XV/GE	PCID301	E- Commerce	-	5	4
	Project		Project		2	
				TOTAL	**30**	**24**
IV	Core XVI/(DSC)	PCOM407	Logistics Management	-	6	4
	Core XVII/(DSC)	PCOM408	Goods and Service Tax (GST)	-	5	5
	Core XVIII/ (DSC)	PCOM409	Advanced Cost & Management Accounting	PCOM406	6	5
	Core XIX/(DSC)	PCOR408	Accounting Package in GST	-	2	1
	Core XX/(DSC)	PCOM411	Human Resource Development	--	6	4
	Project	PCOP401	Project	-	4	6
	Library				1	
				TOTAL	**30**	**25**
				GRAND TOTAL	**120**	**90/92**

PG COURSES OFFERED TO OTHER DEPARTMENTS

Semester	Category	Course Code	Department	Course Title	Contact / Week	Credit	
						Min	Max
III	Core XII/(DSC)	PCOM307/ PCAM311	MCA	Computerized Accounting – Theory	2	2	2
		PCOR308/ PCOR312		Computerized Accounting – Practical	3	2	2

NON- MAJOR ELECTIVE

Semester	Category	Course Code	Course Title	Contact/ Week	Credit	
					Min	Max
II	NME– I/SEC	PCOE202	Export and Import Procedures	5	4	4
		PCOE203	Accounting Package	5	4	4

BUSINESS ENVIRONMENT & POLICIES
PCOM102

Semester : I **Credit : 4**
Category : Core I/(DSC) **Hours/ Week : 6**
Class & Major: I M.Com. **Total Hours : 78**

Objectives:
To Enable the Students

- Understand Various Factors Influencing Business Environment.
- Realize the Importance of Micro and Macro Environment of Business
- Assess the Implications of Industrial, Technological, Political and Legal Factors on the Conduct of Business.

Learning Outcomes:
On Completion of this Course, the Students will be able to:

- Understand The Impact of Business Environment and Policy On Indian Business.
- Analyse the Role of Socio- Cultural and Global Factors on the Development of Economy and Business.
- Apply the Trade Policy and Foreign Investment Policy on Different Sectors.

UNIT I INTRODUCTION **17 Hour**

Business Environment –Social, Political, Economic, Cultural, Technological, Economic and Environment –Scanning – Techniques of Environmental Forecasting –SWOT – Internal Environment – Their Impact On Policy Formulation.

UNIT II GLOBAL BUSINESS TREND **15 Hour**

Economic Reforms In India -Liberalization, Privatization: Globalization –Competitive Strength of Indian Industry -Impact of Liberalization Policy on Different Sectors - Foreign Investments Policy in India

UNIT III MULTINATIONAL COMPANIES **17 Hour**

Multinational – Their Participation in India their Strategies, Competitive Strengths Policies and Performance.

UNIT IV BUSINESS POLICY **15Hour**

Business Policy and Corporate Strategy – Policies Strategies and Tactics, Policies and Procedures – Corporate Strategy –Alternatives – Strategy Choice, Implementations.

UNIT V BUSINESS ETHICS **14Hour**

Business Ethics and Social Responsibility –Relationship Between Business and Society-Corporate Power Social Responsibility – Ethical Issues and Values In Business –Corporate Social Policies – Issues and Challenges - Ecological and Environmental Issues.

Text Book

- Aswathappa. K (2020) *Essentials of Business Management.* Himalaya Publishing House. Mumbai.
- Michael. V. P. (2019) *Business Policy and Environment.* S. Chand & Company Ltd. New Delhi.

Reference Books

- John R. Boatright. (2020) *Ethics and The Conduct of Business.* Pearson Education Private Ltd. Mumbai.
- Raj Agarwal, (2020) *Business Environment,* Excel Books. New Delhi.

FINANCIAL POLICIES AND DECISION MAKING

PCOM104

Semester : I	**Credit : 4**
Category : Core II/(DSC)	**Hrs/ Week : 6**
Class & Major : I M. Com.	**Total hours : 78**

Objectives:

To enable the Students

- Know The Financial Functions In Business Organization
- Familiarize The Recent Global Trends In Finance
- Manage Working Capital.

Learning Outcomes:

On Completion of this Course, the Students will be able to:

- Take Financial Decision Using Capital Budgeting Techniques
- Compute The Cost of Equity and Debt Capital

UNIT I INTRODUCTION OF FINANCIAL MANAGEMENT 15 Hour

Basis of Financial Management – Finance Function – Meaning and Significance – Goals of Financial Management – Factors Affecting Financial Decision – Time Value of Money – Risk, Return & Trade off.

UNIT II COST OF CAPITAL & CAPITAL STRUCTURE 15 Hour

Cost of Capital & Capital Structure – Meaning & Significance – Computation of Individual Sources of Funds and Weighted Average Cost of Capital

UNIT II CAPITAL BUDGETING AND DECISION MAKING 15 Hour

Concept of Capital Budgeting – Capital Expenditure – Factors Affecting Capital Investment Decision- Capital Budgeting Appraisal Methods Viz, Net Present Value Method- Internal Rate of Return Method - Profitability Index Method – Pay Back Method .

UNIT IV WORKING CAPITAL MANAGEMENT 17 Hour

Working Capital Management – Factors Affecting Working Capital – Financing of Working Capital – Estimation of Working Capital - Receivable Management – Inventory Management – Cash Management

UNIT V DIVIDEND POLICY **16 Hour**

Dividend Policy – Factors Affecting Dividend Policy – Dividend Payout Methods – Dividend Theory – Walter and MM Theory

Text Books

- Pandey I.M (2020) *Financial Management.* Vikas Publications. New Delhi.
- Prasanna Chandra.(2020) *Financial Management.* Tata McGraw Hill Publications. New Delhi.

Reference Books

- Khan M. Y and Jain M.K. (2019)*Financial Management.* Kalyani Publications. Chennai.
- Ravikishore M.(2020) *Financial Management.* Taxman Publisher. New Delhi.
- Rochard A. Prady and Stewart C. Mrges. (2020)*Principles of Corporate Finance.* Tata McGraw Hill Publications. New Delhi.

STRATEGIC MANAGEMENT

PCOM105

Semester	**: I**	**Credit**	**: 4**
Category	**: Core III/(DSC)**	**Hours**	**: 6**
Class & Major: I M.Com.		**Total hours**	**: 78**

Objectives:

To Enable the Students

- Understand The Analysis, Formulation, Implementation and Evaluation of Management Strategies
- Formulate Strategies For International Business

Learning Outcomes:

On Completion of this Course, the Students will be able to

- Understand The Basic Concepts and Principles of Strategic Management Analyse The Internal and External Environment of Business
- Develop and Prepare Organizational Strategies that will be Effective for the Current Business Environment
- Devise Strategic Approaches to Managing a Business Successfully in a Global Context

UNIT I INTRODUCTION TO STRATEGIC MANAGEMENT **15 Hour**

Strategic Management – Definition – Scope – Benefits – Risks – Approaches – Models – Strategic Change – Strategic Leadership and Decision Making.

UNIT II SWOT ANALYSIS **17 Hour**

Situation Analysis – SWOT Analysis - Environmental Scanning and Industry Analysis – Forecasting – Internal Scanning - Mission – Objectives – Stakeholder Theory – Cyert and March's Behavioural Theory – Objectives of Non-Profit Organizations – Social Responsibility and Business Ethics.

UNIT III STRATEGY FOUNDATION **15 Hour**

Strategy Formulation – Business Strategy – Corporate Strategy – Diversion Strategy – Portfolio Analysis – BCG Growth /Share Matrix – Strategic Choice – Development of Policies – Strategic Alliances.

UNIT IV STRATEGIC MANAGEMENT **15 Hour**

Strategy Implementation – Organization For Action – Staffing – Leading – MBO –Total Quality Management – Functional Strategies – Growth Strategies – Diversification, Acquisition and Joint Venture – Recovery – Recession and Divestment Strategies – Management Buyout.

UNIT V STRATEGIC CONTROL AND EVALUATION **16 Hour**

Strategic Control and Evaluation – Establishing Strategic Control – Premise Control – Implementation Control – Strategic Surveillance – Special Alert Control – Evaluation Techniques – Managing Change – Strategic Issues In Managing Technology and Innovation – Strategic Effectiveness.

Text Books

- John L.Thompson (2020) *Strategic Management – Awareness and Change.* Chapman Hall
- Publications. Chennai.
- David Hunger J and Thomas L. (2019) *Strategic Management.* Addison Wesley Longman
- Publications. Chennai.

Reference Books

- Gregory G.Dess and Alex Miller. (2018) *Strategic Management.* Tata McGraw Hill Publications, New Delhi.
- Charles. W.L. and John Gareth.(2019) *Strategic Management – An Integrated Approach.* Cengage India.

CORPORATE GOVERNANCE & BUSINESS ETHICS

PCOM107

Semester : I	**Credit : 4**
Category : Core IV/(DSC)	**Total Hrs : 6**
Class & Major : I M.Com.	**Total hours : 78**

Objectives:

To Enable the Students

- Understand the Concept of Corporate Governance and Its Principles
- Appraise the Duties and Powers of Board of Directors
- Standardize Business Ethics in Various Areas of Corporate Sectors

Learning Outcomes:

On Completion of this Course, the Students will be able to

- Critically Evaluate The Theory of Corporate Governance and Apply this Theory in Analyzing Corporate Structures, Board Composition and how Boards of Directors Conduct their Affairs.
- Critically Evaluate the Range of Ethical Issues that Arise in Management and Business Organizations.

UNIT I INTRODUCTION TO CORPORATE GOVERNANCE 15 Hour

Corporate Governance – Definition – Principles of Corporate Governance – Reasons Necessitated Corporate Governance.

UNIT II CORPORATE ADMINISTRATION 17 Hour

Corporate Administration – Corporate Board Structure – Board of Directors – Size of The Board – Composition of Board – Board Management – Advantages of Corporate Governance – Corporate Governance Failures- Suggestions – Emerging Trends In Corporate Governance.

UNIT III BOARD OF DIRECTORS DUTIES AND POWERS 16 Hour

Board of Directors – Kinds of Directors - External, Internal and Independent Directors – Appointment Duties and Powers.

UNIT IV SHAREHOLDERS DEMOCRACY 15 Hour

Shareholders Democracy – Rights of Shareholders – Individual Rights – Group Rights.

UNIT V BUSINESS ETHICS 15 Hour

Nature, Scope and Purpose of Ethics, Relevance of Values, Importance of Ethics and Moral Standards, Ethics and Moral Decision Making, Cases of Companies Violating Ethics

Text Books

- Balachandran V and Chandrasekaran V. (2020) *Corporate Governance Ethics and Social Responsibility*. Prentice Hall of India, New Delhi.
- Kapoor N.D. (2020) *Elements of Company Law.* Sultan Chand & Sons. New Delhi.

Reference Books

- Srinivasan. (2019) *Company Law & Secretarial Practice.* Margham Publishers. Chennai.
- Rao A.B. (2020) *Business Ethics and Professional Values.* Excel Books. Chennai.

COMPUTERIZED ACCOUNTING - THEORY

PCOM108

Semester	**: I**	**Credit**	**: 2**
Category	**: Core V/(DSC)**	**Hours /Week**	**: 2**
Class & Major	**: I M.Com**	**Total Hours**	**: 26**

Objectives:

To Enable the Students

- Understand the Accounting Concepts and Conventions
- Familiarize in Inventory Report, Cost Report & Tax Filling Procedure.

Learning Outcomes:

On Completion of this Course, the Students will be able to

- Create Company, Groups, Ledger and Vouchers in Accounting Software.
- Prepare Financial Statements and Final Accounts in Tally.
- Prepare Inventory Report, Cost Report, Pay Roll and Tax Reports in Tally.

UNIT I INTRODUCTION TO COMPUTERIZED ACCOUNTING **4 Hour**

Types of Accounts –Golden Rules of Accounting–Accounting Concepts and Conventions– Double Entry System of Book Keeping– Mode of Accounting– Financial Statements– Transactions–Recording of Transactions – Basic Concepts of Computerized Accounting– Features of Tally

UNIT II VOUCHER CREATION **5 Hour**

Creation of Company– Alteration– Deletion– Creation of Groups– Alteration– Deletion– Creation of Ledger – Creation of Vouchers in Tally– Preparation of Final Accounts with Adjustment

UNIT III INVENTORY REPORT **6 Hour**

Stock Groups– Stock Categories– Purchase Order Summary– Altering a Purchase Order– Deleting a Purchase Order– Sales Order Summary– Altering a Sales Order– Deleting Entries in Sales Order– Invoice Entry– Invoice Configuration

UNIT IV COST REPORT **5 Hour**

Bill of Materials – Introduction – Creation of Manufacturing Journal – Top Portion of Manufacturing Journal – Lower Portion of Manufacturing Journals – Cost Centers and Cost Categories– Multiple Currencies

UNITV TAX REPORTS **6 Hour**

Tax Deduction at Source in Tally and Payroll Report – Bank Reconciliation – Interest Calculations– Budgetary Control **Proportion: Problem: 80%, Theory: 20%**

Text Books

- Nadhani A.K. and Nadhani K.K. (2020) *Implementing Tally*. BPB Publications. New Delhi.
- Palanivel S. (2020) *Tally Accounting Software.* Margham Publications. Chennai.

Reference Books

- Vishnu Priya Singh. (2019) *Quick Learn Tally*. Computech Publication Pvt. New Delhi.
- SrinivasaValaban. (2020) *Computer Applications in Business.* Sultan Chand & Sons.

COMPUTERIZED ACCOUNTING – PRACTICAL

PCOR109

Semester : I | **Credit : 2**
Category : Core Practical VI/(DSC) | **Hours/Week : 3**
Class & Major : I M.Com. | **Total hours : 39**

Objectives:

To Enable the Students

- Understand the use and Application of Computers in Accounting.
- Prepare Financial Statements and Reports using Accounting Software.

Learning Outcomes:

On Completion of this Course, the Students will be able to

- Create Company, Groups, Ledger and Vouchers in Accounting Software.
- Prepare Financial Statements and Final Accounts in Tally.
- Prepare Inventory Report, Cost Report, Pay Roll and Tax Reports in Tally.

Exercises

1. Creation of Company , Groups and Ledger
2. Creation of Vouchers and Journals
3. Preparation of Final Accounts with Adjustment
4. Entering Data In Stock Groups and Category
5. Creating A Purchase Order and Sales Order
6. Preparation of Invoice Entry and Invoice Configuration
7. Creation of Bill-Wise Details
8. Creation of Cost Centers and Cost Categories
9. Using Multiple Currencies
10. Preparation of Bank Reconciliation Statement
11. Calculation of Interest
12. Preparation of Budget and Control System
13. Payroll Report

Evaluation Pattern

Internal Assessment	
Component	**Maximum Marks**
CIA I	10
CIA II	10
Daily Practical Assessment(DPA)	30
Viva Voce	10
Total	**60**
External Assessment	
Component	**Maximum Marks**
Record	20
Viva Voce	10
Result	10
Total	**40**

GLOBAL MARKETING
PCOM202

Semester	**: II**	**Credit**	**: 4**
Category	**: Core VII/(DSC)**	**Hours/ Week**	**: 6**
Class & Major	**: I M.Com.**	**Total Hours**	**: 78**

Objectives:

To Enable the Students

- Gain Awareness on International Marketing and Domestic Marketing.
- Gain Knowledge on International Marketing Strategies and Operations.
- Enhance Knowledge with Regard to International Trade Promotion.

Learning Outcomes:

On Completion of this Course, the Students will be able to

- Understand Major Issues Related to International Marketing
- Analyze Trends in Global Markets and in Modern Marketing Practice
- Assess an Organization's Ability to Enter and Compete in International Markets.

UNIT I INTRODUCTION TO INTERNATIONAL MARKETING 15 Hour

Introduction to International Marketing: Basic Concepts – Analyzing International Marketing Environment – International Market Segmentation

UNIT II INTERNATIONAL PRODUCT AND PRICING 15Hour

International Product and Pricing Decision: International Product Planning, Branding, Packing and Other Decisions, International Pricing.

UNIT III PRODUCT DISTRIBUTION AND PROMOTION 16Hour

International Distribution and Promotion: International Distribution – Marketing Communication – Advertising – Personal Selling, Publicity and Sales Promotion.

UNIT IV MANAGING INTERNATIONAL MARKETING OPERATIONS 15Hour

Managing International Marketing Operations: International Marketing Planning, Organizing and Control – Emerging Trends and Issues In International Marketing.

UNIT V INTERNATIONAL ECONOMIC INSTITUTIONS 17 Hour

International Infrastructure for Trade Promotion: GATT/ WTO – Export Promotion Councils –Service Institutions – IITF- NCIF –ECGC – EXIM Bank.

Text Books

- Cherian, and Jacob. (2018) *Export Marketing.* Himalayan Publishing House. Chennai.
- Warnen, J. Keegan. (2019) *Global Marketing.* Prentice Hall of India, New Delhi.

Reference Books

- Varshney, R.L. and Bhattacharya, B. (2018)*International Marketing Management.* Sultan Chand & Sons. New Delhi.
- Hollensen, Svend. (2017) Global Marketing: A decision-oriented approach. Prentice Hall. Harlow. England.
- Bradley Fran, J. (2018) *International Marketing Strategy.* Prentice Hall. Pearson Education: Harlow. England.

ADVANCED ACCOUNTING

PCOM208

Semester : II **Credit : 4**
Category : Core IX/(DSC) **Hours/ Week : 6**
Class & Major : I M.Com **Total Hours : 78**

Objectives:

To Enable the Students

- Gain Knowledge on Accounting Standards
- Gain Knowledge in Corporate Accounting.
- Prepare Merger and Acquisition Accounts.

Learning Outcomes:

On Completion of this Course, the Students will be able to

- Prepare Final Accounts of Banking and Insurance Companies.
- Prepare Final Accounts of Electricity Companies.
- Prepare Inflation Accounts.

UNIT I INTRODUCTION **12 Hour**

Accounting Standards: Introduction to Accounting Standards – Auditors Duties in Relation to Accounting Standards – Accounting Standards Issued by the Accounting Standard Board of ICAI-IFRS.

UNIT II PREPARATION OF FINANCIAL STATEMENT **16 Hour**

Preparation of Financial Statements of Limited Companies: Treatment of Adjustments, P&L Appropriation Account, Amendments in the Company's Bill – Holding and Subsidiary Companies – Consolidation of Financial Statements.

UNIT III MERGER AND ACQUISITION **20 Hour**

Accounting Aspects of Merger and Acquisition: Meaning and Nature of Amalgamation, Methods of Accounting for Amalgamation (by Merger and Purchase Method) Absorption-External Reconstruction, Calculation of Purchase Consideration Under Different Methods – Realization of Various Assets and Liabilities.

UNIT IV BANKING COMPANY ACCOUNTS & GENERAL INSURANCE ACCOUNTS **16 Hour**

Banking Company Accounts –Legal Provisions – Capital Adequacy Norms – Rebate on Bills Discounted – Asset Classification and Provisioning – Preparation of Final Accounts of General Insurance Company with Relevant Schedule.

UNIT V ELECTRICITY COMPANY ACCOUNTS AND INFLATION ACCOUNT **14 Hour**

Accounts of Electricity Companies: Preparation of Final Accounts using Statutory Forms prescribed by Electricity Rules 1956 – Replacement of an Asset-Inflation Accounting – Need – Objectives – Adjustments for General Price Changes – Current Purchasing Power Accounting (CPP) – CPP method of Preparing Financial Statement.

Text Books

- Gupta R.L. (2020) *Advanced Accounting.* Volume II. Sultan Chand Publication. New Delhi.
- Reddy T.S. and MurthyA. (2020)Advanced *Accounting.* Volume II. Margham Publication. Chennai.

Reference Books

- Jain and Narang. (2020) *Financial Accounting.* Kalyani Publishers. Chennai.
- Shukla and Grewal. (2020) *Advanced Accounting.* S.Chand Publications. New Delhi.

E-Resources

- https://www.icai.org/post.html?post_id=16950
- https://icmai.in/upload/Students/Syllabus2016/Inter/Paper-5-April-2021.pdf

DERIVATIVES AND RISK MANAGEMENT

PCOM210

Semester : II	**Credit : 4**
Category : Core X/(DSC)	**Hours/Week : 6**
Class : I M.Com.	**Total hours : 78**

Objectives:

To Enable the Students

- Understand the Functions and Developments of Derivatives Market.
- Demonstrate an Understanding of Pricing Forwards, Futures and Options Contracts

Learning Outcomes:

On Completion of this Course, the Students will be able to

- Analyse Price Diverse Derivative Products to Generate an Optimal Risk Management Strategy.
- Demonstrate Critical Thinking, Analytical and Problem Solving Skills in the Context of Derivatives Pricing and Hedging Practice.
- Explain the Binomial Model and Its Extension in Continuous Time to the Black & Scholes Model.

UNIT I DERIVATIVES **16 Hour**

Definition – Products – Participants and Functions – Types of Derivatives – Development of Exchange Traded Derivatives – Global Derivatives Markets – Exchange Trade Versus OTC Derivatives – Derivatives Market in India.

UNIT II OPTIONS **16 Hour**

Development of Options Markets – Call Options – Put Options – Organized Options Trading – Listing Requirements – Contract Size – Exercise Prices – Expiration Dates – Position & Exercise Limits – Exchange on Which Options Trade – Option Traders.

UNIT III FORWARD CONTRACTS **16 Hour**

Futures Contracts – Structure of Forward and Future Markets – Development of Futures Market – Organized Futures Trading – Futures Exchanges – Futures Traders.

UNIT IV PRINCIPLES OF OPTION PRICING **15 Hour**

Put Call Parity Relationship – Option Pricing Models – The Black & Scholes Model – The Binomial Model – Principles of Forward and Future Pricing – The Cost of Carry Model.

UNIT V MANAGING MARKET RISK **15 Hour**

Concept of Risk – Type of Risk – Systematic Risk – Unsystematic Risk – Risk Management Process – Risk Identification – Risk Evaluation – Risk Mitigation – Risk Handling.

Text Books

- Robert and W.Kolb, (2020). *Understanding Futures Markets*, Prentice Hall of India. New Delhi.
- Franklin and R.Edwards, (2019). *Futures and Options.* Tata Mc Graw Hill. New Delhi.
- Balla, V.K. (2020). *Financial Derivatives and Risk Management.* S.Chand. New Delhi.
- Patwari, D.C. (2020). *Options and Futures in an Indian* P*erspective.* Jaico Publishers. New Delhi.

Reference Books

- Chance, D.M. (2020). *Introduction to Derivatives and Risk Management.* Thomson Learning, UK.
- John C. Hull. (2021). *Options, Futures and Other Derivatives.* Prentice Hall India, UK.

EXPORT AND IMPORT PROCEDURES

PCOE202

Semester : II **Credit : 4**
Category : Non-Major Elective - II/SEC **Hours/Week : 5**
Class & Major : I PG **Total Hours : 65**

Objectives:

To Enable the Students

- Gain Knowledge on Procedures of Export and Import Transactions
- Understand the Features of Export Incentive Schemes.
- Understand the Payment Methods, Risks and Various Financing Strategies

Learning Outcomes:

On Completion of this Course, the Students will be able to

- Undertake Export and Import Business
- Apply the Documentation Formalities in to Export and Import Transactions.

UNIT I INTRODUCTION **10 Hour**

Foreign Trade - Meaning – Importance – Domestic Trade versus Foreign Trade. Free Trade – Barriers to trade.

UNIT II DOCUMENTATION **14 Hour**

Documentation Frame Work – Processing of an Export Order – Export Financing Methods and Methods of Payment in International Trade – Custom Clearance Regulation – Pre and Post Shipment Export Credits.

UNIT III EXPORT AND IMPORT PROCEDURE **15 Hour**

Procedure For Procurement Through Imports – Import Financing - Custom Clearance.

UNIT IV RISKS **13 Hour**

Credit And Exchange Risk – Marine Insurance – Importance - Insurance Covers of Export Credit Guarantee Corporation.

UNIT V EXPORT INCENTIVE **13 Hour**

Export Incentive – Duty Drawback Scheme – Duty Exemption Scheme – Tax Incentives.

Text Books

- Varshney and Bhattacharya. (2020) *International Marketing Management*. S.Chand & Sons. New Delhi.
- Cherian, and Jacob. (2018) *Export Marketing.* Himalayan Publishing House. Chennai.
- Warnen, J. Keegan. (2019) *Global Marketing.* Prentice Hall of India.

Reference Books

- Varshney, R.L. and Bhattacharya, B.(2018) *International Marketing Management.* Sultan Chand & Sons. New Delhi.
- Hollensen, Svend. (2017) Global Marketing: A decision-oriented approach. Prentice Hall. Harlow. England.
- Bradley Fran, J. (2018) *International Marketing Strategy.* Prentice Hall. Pearson Education: Harlow. England.

ACCOUNTING PACKAGE

PCOE203

Semester	**: II**	**Credit**	**: 4**
Category	**: Non-Major Elective - II/SEC**	**Hours/Week**	**: 5**
Class & Major	**: I PG**	**Total Hours**	**: 65**

Objectives:

To Enable the Students

- Understand the use and Application of Computers in Accounting.
- Prepare Financial Statements and Reports Using Accounting Software.

Learning Outcomes:

On Completion Of This Course, The Students Will Be Able To

- Create Company, Groups, Ledger and Vouchers in Accounting Software.
- Prepare Financial Statements and Final Accounts in Tally.
- Prepare Inventory Vouchers and Stock Groups in Tally.

UNIT I INTRODUCTION **10 Hour**

Introduction to Accounting - Meaning – Scope – Functions – Double Entry System of Book Keeping – Meaning – Advantages - Concepts and Conventions.

UNIT II JOURNAL, LEDGER AND TRAIL BALANCE **14 Hour**

Concepts of Journal & Subsidiary Books – Meaning of Journal - Format of Journal – Cash Book – Subsidiary Books – Posting to Ledger – Meaning – Trial Balance – Objectives – Preparation of Trial Balance (Simple Problems Only).

UNIT-III FINAL ACCOUNTS **15 Hour**

Preparation of Final Accounts – Simple Adjustment Entries (Simple Problems Only) - Introduction To Tally – Advantages of Computerised Accounting – Features of Tally – Creation of Company – Altering and Deleting Company.

UNIT IV ACCOUTING VOUCHERS **13 Hour**

System Defined Groups – Primary and Sub Groups – Creation of Ledgers – Altering and Deleting Ledgers – Types of Accounting Vouchers – Displaying Trial Balance, P&L Account and Balance Sheet.

UNIT V INVENTORY MANAGEMENT **13 Hour**

Inventory Management – Creation of Stock Groups — Stock Categories – Units of Measure – Godowns – Stock Items – Methods of Valuing Stock- Inventory Vouchers – Displaying Stock Summary

Text Books

- Gupta R.L. (2020) *Advanced Accountancy.* Volume I. Sultan Chand & Sons. New Delhi.
- Palanivel. S. (2020) *Tally.* Margham Publications, Second edition, Chennai.

Reference Books

- Reddy T.S. and Murthy.A (2020) *Financial Accounting.* Margham Publication. Chennai.
- Jain & Narang. (2020) *Financial Accounting.* Kalyani Publishers. Chennai.
- *Tally Self Learning Guide & Work Book.* Volume I. (2020) Tally Solutions Pvt. Ltd. Mumbai.
- Rita Bhargava. (2020) *A Short Course on Tally.* Cyber Tech Publications. New Delhi.

III & IV EVALUATION COMPONENTS OF CIA

Semester	Category	Course Code	Course Title	Component III	Component IV
I	Core I/(DSC)	PCOM102	Business Environment and Policy	Seminar	Poster Presentation
	Core II/(DSC)	PCOM104	Financial Policies and Decision Making	Problem Solving	Seminar
	Core III/(DSC)	PCOM105	Strategic Management	Corporate Success Story	SWOT Analysis
	Core IV/(DSC)	PCOM107	Corporate Governance & Business Ethics	Seminar	Drafting Business Proposal
	Core V/(DSC)	PCOM108	Computerized Accounting	Assignment	Problem solving
	Core VI/(DSC)	PCOR109	Computerized Accounting - Practical	Assignment	Problem solving
II	Core VII/(DSC)	PCOM202	Global Marketing	Album Making	Seminar
	Core IX/(DSC)	PCOM208	Advanced Accounting	Assignment	Problem Solving
	Core X/(DSC)	PCOM210	Derivatives and Risk Management	Assignment	Seminar

PG NON MAJOR ELECTIVE

Semester	Category	Course Code	Course Title	Component III	Component IV
II	Non Major Elective II/SEC	PCOE202	Export & Import Procedure	Case Study	Album making
		PCOE203	Accounting Package	Seminar	Problem Solving

DEPARTMENT OF BIOCHEMISTRY

PREAMBLE

UG: Programme Profile & the Syllabi of Courses Offered in the Semester I and II along with III & IV Evaluation Components (with Effect from 2021 - 2024 Batch onwards).

PG: Programme Profile & the Syllabi of Courses offered in the Semester I and II along with III & IV Evaluation Components (with Effect from 2021 - 2023 Batch onwards) are presented in this Booklet.

PROGRAMME PROFILE OF B.Sc., BIOCHEMISTRY

PROGRAMME SPECIFIC OUTCOMES (PSO)

Upon completion of the Programme, the students will be able to

- Understand the Various Biological Components Present in Living Cells and its Functions.
- Recognize their Own Ability to improve their own Competence in Using the Language through Professional English Course.
- Inculcate the Basic Concepts of Biochemistry Including an Understanding of the Fundamental Biochemical Principles and their Applications in a Systematic, Methodical, and Scientific, Evidence - Based Process.
- Develop Problem Solving and Analytical Skills through Case Studies, Research Projects, Experimentation, Internship, Experiential Learning and Hands - On - Experience.
- Analyze the Applications of Biochemistry in the Fields of Clinical Biochemistry, Biochemical Techniques, Molecular Biology, Biotechnology, Microbiology Etc.
- Apply the Major Theories and Research Procedures to Contemporary Social Problems.

Semester	Part	Category	Course code	Course Title	Previous course code	Hour per week	Credit Min / Max
I	I	Language/ AECC-II / Tamil (2 Levels) Hindi / French	UTAL107/ UTAL108/ UHIL102/ UFRL102	Basic Tamil I / Advanced Tamil I / Hindi I / French I	UTAL105/ UTAL106/ UHIL101/ UFRL101	5	3/4
	II	Communicative English I / AECC-I (2 Levels)	UENL109/ UENL110	English for Communication (Stream – I)/ English for Communication (Stream – II)	--	5	3/4
	III	Major Core I / DSC - I	UBCM108	Basics of Biochemistry	UBCM106	3	2
		Major Core II / DSC - II	UBCM107	Cellular Biology	UBCM105	6	6
		Core Practical I	UBCR102	Cellular Biology Practical	UBCR101	3	3
		Allied I / GE I	UCHA102	Allied Chemistry	UCHA101	3	2
		Allied Practical	UCHR103 / UCHR403	Allied Chemistry Practical	--	3	2
		PE - I	UPEM101	Professional English I	--	6	4
	IV	Value Education / SEC			--	2	1
					TOTAL	**36**	**26/28**

II	I	Language / AECC-II / Tamil (2 Levels) Hindi / French	UTAL207 / UTAL208 / UHIL202 / UFRL202	Basic Tamil II/ Advanced Tamil II/ Hindi II/ French II	UTAL205/ UTAL206/ UHIL201/ UFRL201	5	3/4
	II	Communicative English / AECC-II (2 Levels)	UENL209/ UENL210	English for Communication (Stream – I)/ English for Communication (Stream – II)	--	5	3/4
	III	Major Core III/DSC - III	UBCM203	Biomolecules	UBCM202	6	6
		Core practical II	UBCR202	Qualitative analysis of Biomolecules	UBCR201	5	5
		Allied II/ GE -II	UMBA202	Microbiology	UMBA201	3	2
		Allied II practical	UMBR202	Microbiology Practical	UMBR201	3	2
		PE - II	UPEM201	Professional English II	--	6	4
	IV	Non Major elective /SEC	--	--	--	3	2
	V	Extension activity/ Physical Education/NCC	--	--	--	-	1/2
					TOTAL	**36**	**28/31**
III	I	Language/ AECC-II / Tamil (2 Levels) Hindi / French	UTAL307/ UTAL308/ UHIL302/ UFRL302	Basic Tamil III/ Advanced Tamil III/ Hindi III/ French III	UTAL305/ UTAL306/ UHIL301/ UFRL301	5	3/4
	II	Communicative English / AECC-I (2 Levels)	UENL309/ UENL310	English for Communication (Stream – I)/ English for Communication (Stream – II)	UENL307/ UENL308	5	3/4
	III	Major Core IV / DSC - IV	UBCM305	Biochemical Techniques	UBCM304-	6	6
		Core Practical III	UBCR302	Biochemical Techniques practical I	UBCR301	3	3
		Allied III/ GE - III	UMAA305	Biostatistics	UMAA405	6	4
	IV	Online Course		NPTEL/Spoken Tutorial		3	1/2
		Value Education/ SEC				2	1
					TOTAL	**30**	**21/24**
IV	I	Language/ AECC-II / Tamil (2 Levels) Hindi / French	UTAL407/ UTAL408/ UHIL402/ UFRL402	Basic Tamil IV/ Advanced Tamil IV/ Hindi IV/ French IV	UTAL405/ UTAL406/ UHIL401/ UFRL401	5	3/4
	II	English / AECC-I (2 Levels)	UENL409/ UENL410	English for Communication Stream – I)/ English for Communication (Stream – II)	UENL407/ UENL408	5	3/4
	III	Major Core V / DSC - V	UBCM403	Immunology	UBCO603	4	4
		Major Core VI / DSC - VI	UBCM405	Pharmaceutical Biochemistry	UIDM401	2	2
		Allied IV/ GE -IV	UBIA401	Basics of Bioinformatics	UBCM506	6	4
		Core practical IV	UBCR401	Biochemical Techniques Practical II	UBCR401	3	3
	IV	Non Major Elective			--	3	2
		Soft Skill/ SEC			--	2	1

IV	V	Extension Activity/ Physical Education/NCC			--	-	- /2
					TOTAL	**30**	**22/26**
V	III	Major Core VII /DSC - VII	UBCM507	Enzymology	--	5	5
		Major Core VIII/DSC - VIII	UBCM508	Enzymes & Intermediary metabolism	UBCM504	5	5
		Major Core IX / DSC - IX	UBCM505	Human Physiology	UBCM502	5	5
		Major Elective - I / DSE - I	UBCO501	Nutritional Biochemistry	--	5	4
			UBCO502	Stem cell Biology	UBCO604		
		Core practical V	UBCR501	Enzymology Practical	UBCM501	4	3
		Major Core X / DSC - X	UBCP501	Project	UBCP601	4	4
		Value Education/ SEC				2	1
					TOTAL	**30**	**27**
VI	III	Major Core XI / DSC - XI	UBCM605	Introduction to Biotechnology	UBCM601	5	5
		Major Core XII / DSC - XII	UBCM606	Clinical Biochemistry	UBCM602	5	4
		Major Core XIII / DSC - XIII	UBCM607	Molecular Biology	UBCM603	5	4
		Major Core XIV / DSC - XIV	UBCM604	Comprehensive Viva voce	--	-	1
		Core Practical VI	UBCR601	Clinical Biochemistry practical	--	5	3
		Core Practical VII	UBCR602	Hematology & Urine analysis	--	3	2
		Major Elective – II / DSE - II	UBCO607	Molecular Endocrinology	UBCO605	5	4
			UBCO606	Pathobiology of Human Diseases and Disorders	--		
			UIDM601	Nanotechnology in medicine	--		
	IV	Soft Skill/ SEC				2	1
	V	Extension activity/ Physical Education/NCC				-	-/2
					TOTAL	**30**	**24/26**
					GRAND TOTAL	**192**	**148/162**

COURSES OFFERED TO OTHER DEPARTMENTS
NON MAJOR ELECTIVES (NME)

Semester	Part	Category	Course code	Course Title	Previous course code	Contact Hour/ Week	Credit Min/Max
II	IV	Non Major Elective	UBCE202	Biomedical Techniques	--	4	2
			UBCE204	Nutrition & Health	UBCE401		
			UBCE502/ UBCE204	Women's Health, Nutrition & Disorders	--		
			UBCE304/ UBCE208	Mushroom Cultivation	--		
			UBCE209	Clinical Diagnostics	--		
			UBCE210	Reproductive Biology	--		
IV	IV	Non Major Elective	UBCE301/ UBCE403	Hormonal Biochemistry	--	4	2
			UBCE302/ UBCE404	Food Microbiology	--		
			UBCE402/ UBCE303	Clinical Nutrition	--		
			UBCE304	Mushroom Cultivation	--		

EXTRA CREDIT EARNING PROVISION (Only for Interested Students)

Semester	Part	Category	Course Code	Course Title	Credit
II	III	Internship	UBCI201	Summer Internship	1
IV	III	Internship	UBCI401	Summer Internship	1
VI	III	Self Study paper	UBCS601	Experimentation	2

EXPERIENTIAL LEARNING OFFERED IN SEMESTER VI

Course Mapping				Collaborating Agency –MSME & E.S. Hospital		
Semester	Course Code	Course Title	Assessment	Course Title	Hour/Days/ Month	Mode of Evaluation
VI	UBCM606	Clinical Biochemistry	Component III	Clinical Biochemistry	5 days	Reflection
VI	UBCM605	Introduction to Biotechnology	Component IV	Organic Farming	2 days	Reflection

BASICS OF BIOCHEMISTRY

UBCM108

Semester : I **Credit: 2**
Category : Core I/ DSC – I **Hour/Week: 3**
Class & Major : I B.Sc. Biochemistry **Total Hour: 39**

Objectives:

To enable the students

- Understand the Basic Concepts in Biochemistry and its Applications.
- Learn about the Bioenergetics and Significance of Biological Buffers.
- Provide Knowledge on Good Laboratory Practices.

Learning Outcomes:

On Completion of the course, the students will be able to

- Understand the Importance and Scope of Biochemistry.
- Gain Knowledge about Biological Molecules and its Significance.
- Familiarize the Laws of Thermodynamics and Biological Buffers.
- Aware about the Quality Control Practices and Biosafety Measures Followed in the Laboratory.

UNIT - I OVERVIEW OF BIOCHEMISTRY **7 Hour**

History and Scope of Biochemistry, Importance of Biochemistry and its Applications in Various Fields. Cells - Types, Subcellular Organelles.

UNIT - II PROPERTIES OF WATER & CONCENTRATION UNITS **8 Hour**

Structure and Properties of Water & Structure of Matter - Atomic Structure, Molecular Structure; Bonding - Ionic, Covalent, Hydrogen, Co Ordinate and Vander Walls Interaction and Chemical Reactions.

Units of Measurements of Solutes in Solution - Normality, Molality, Molarity, Osmolarity, Ionic Strength, Percentage and Mole Fraction.

UNIT - III BIOMOLECULAR CHEMISTRY **7 Hour**

Definition and Importance of Carbohydrates, Amino Acids, Proteins, Lipids, Nucleic Acids, Enzymes, Vitamins and Hormones.

UNIT - IV BIOENERGETICS & BIOLOGICAL BUFFERS **8 Hour**

Laws of Thermodynamics - Zero, First and Second Law, Oxidation and Reduction Reaction, Redox Potential and Energy Transfer.

Inorganic Compounds - Salts, Ions, Acids and Bases; pH, Biological Buffers and their Significance.

UNIT - V QUALITY CONTROL PRACTICES AND BIOSAFETY **9 Hour**

Precision, Accuracy, Specificity, Sensitivity, Percentage Error and Quality Control for Laboratory Methods. Calibration of Volumetric - Pipette, Burette and SMF.

Do's And Don'ts in the Laboratory, Automation and Instrumentation Used in Laboratory, Laboratory Associated Infections, First Aid, Biological Hazards and Biosafety.

Text Books

- Gupta, P.K. (2005). *A Text-Book of Cell and Molecular Biology*. Rastogi Publications. Meerut. India. (4th Ed.).
- Ambika Shanmugam. (2016). *Fundamentals of Biochemistry.* Published by Author. (8th Ed.).

Reference Books

- Campbell, M.K. (2006). *Biochemistry.* Philadelphia. Saunders College Publishing.
- Marshal, V.C. (2005). *Major Chemical Hazard.* Chichester. United Kingdom. Ellis Horwood Ltd.
- Raghavan, K.V. Khan, A.A. (2012). *Methodologies in Hazard Identification and Risk Assessment.* Manual by CLRI.
- Sadasivam, S. Manickam, A. (2008). *Biochemical Methods.* New Age International (P) Ltd.

E - Resources

- https://epgp.inflibnet.ac.in/
- Biochemistry-book-U-Satyanarayana ebook/dp/B07F9QHV6Z?asin=B07F9QHV6Z&revisionId=&format=2&depth=1
- https://www.amazon.com/dp/B0725LHWPB?tag=uuid10-20&asin=B0725LHWPB&revisionId=f5f49437&format=1&depth=1

CELLULAR BIOLOGY

UBCM107

Semester : I **Credit : 6**
Category : Core II/DSC - II **Hour/Week : 6**
Class & Major: I B.Sc. Biochemistry **Total Hour : 78**

Objectives:

To enable the students

- Basic Knowledge on Origin of Life and Cell Theory.
- Gain Knowledge about the Structure and Function of Various Cell Organelles in Prokaryotic and Eukaryotic Cells.
- Acquire insight into Cell Division and Cell Death Mechanisms.

Learning Outcomes:

On Completion of the course, the students will be able to

- Understand about the Origin and Evolution of the Cell.
- Get Knowledge on Structure of Nucleus and Organization of Chromosomes.
- Illustrate the Structure and Properties of Cell Membrane and Different Types of Transport Mechanism across Cell Membrane.
- Disseminate Knowledge about the Chemistry and Functions of Sub Cellular Organelles
- Elucidate the Cell Cycle, Cell Division and Cell Death Mechanisms.

UNIT - I ORGIN OF LIFE & CELL THEORY **15 Hour**

An Overview of Cells - Origin and Evolution of Cells. Cell Theory, Classification of Cells - Prokaryotic and Eukaryotic Cells, Comparison of Prokaryotic and Eukaryotic Cells. Mycoplasma Viruses.

UNIT – II NUCLEUS & CHROMOSOMES **18 Hour**

Nucleus - Structure and Functions. Chromosomes - Chromatin Structure. The Cell Cycle - Phases of Cell Cycle. Meiotic and Mitotic Cell Division**.** Apoptosis and Necrosis.

UNIT - III CELL WALL AND CELL MEMBRANE **15 Hour**

Structure and Functions - Bacterial Cell Wall and Plant Cell Wall; Cell Membrane - Fluid Mosaic Model and Unit Membrane Model Structure. Membrane Proteins and their Properties Membrane Carbohydrates and their Role. Transport across Membranes - Uniport, Antiport, Diffusion, Active and Passive Transport.

UNIT-IV ENDOPLASMIC RETICULUM, GOLGI APPARATUS, LYSOSOMES 15 Hour

Endoplasmic Reticulum - Types, Structure and Functions. Golgi Apparatus - Structure and Function. Lysosomes - Structure and Functions, Morphology and Functions of Peroxisomes and Glyoxysomes.

UNIT - V MITOCHONDRIA & CYTOSKELETON **15 Hour**

Mitochondria - Structure and Functions. Cytoskeleton - Types of Filaments and their Functions Microtubules - Chemistry and Functions. Cilia and Flagella. Ribosomes - Types Structure and Function. Vacuoles - Structure and Function.

Text Books

- Lohar, S.Prakash. (2007). *Cell and Molecular Biology.* MJP Publishers.
- Verma,P.S. and Agarwal. (2008). *Cell Biology, Genetics, Molecular Biology, Evolution and Ecology.* S. Chand Publication.

Reference Books

- Cooper, G.M. and Hausman, R.E. (2013). *The Cell*: *A Molecular Approach*. ASM Press & Sinauer Associates. (8th Ed.). Sunderland (Washington DC).
- Karp, G. (2010). *Cell and Molecular Biology*: *Concepts and Experiments.* John Wiley and Sons. (6th Ed.).

E - Resources

- https://epgp.inflibnet.ac.in/
- https://nptel.ac.in/courses/102/103/102103012/
- https://swayam.gov.in/nd2_cec19_bt12/preview
- https://www.saraspublication.com/books/cell-biology-molecular-biology/

CELLULAR BIOLOGY PRACTICAL

UBCR102

Semester : I **Credit : 3**
Category : Core Practical **Hour/Week : 3**
Class & Major: I B.Sc. Biochemistry **Total Hour : 39**

Objectives:

To enable the students

- Understand Plant and Animal Cells.
- Gain Practical Insight of Structural Features of Prokaryotes and Eukaryotic Cells.
- Apply the Methods in Cell Biology.

Learning Outcomes:

On Completion of the course, the students will be able to

- Acquainted to Various Microscopic Techniques to Visualize Subcellular Organelles.
- Differentiate the Cells of Various Living Organisms and Get Awareness of Physiological Processes of Cell E.G. Cell Divisions.
- Observe and Correctly Identify Different Cell Types, Cellular Structures Using Different Microscopic Techniques.
- Observe and Classify the Prokaryotic Cells (Bacteria) Using Differential Staining.

Experiments

1. Use of Microscopes.
2. Blood Smear Preparation
3. Mounting Buccal Epithelium and Observing Living Cells Using Vital Staining.
4. Mitosis in Onion Root Tip Squash.
5. Cytochemical Staining of Protein by Methylene Blue.
6. Cell Counting and Viability (Yeast / Bacteria)
7. Study of Prepared Slides of Histology (any five)
   a) Columnar Epithelium
   b) Ciliated Epithelium
   c) Glandular Epithelium
   d) Alveolar Connective Tissue
   e) Cartilage T.S
   f) Cardiac Muscle
   g) Striated Muscle
   h) Non Striated Muscle
   i) Nervous Tissue
8. Barr Body Staining from Buccal Epithelial Cells
9. Isolation of Chloroplast from Spinach Leaves.

Text Book

- Dr.Rajan, S. Mrs. Selvi Christy, R. (2010). *Experimental Procedure in Life Science.* Anjanaa Book House. Chennai.

Reference books

- Chris Hawes & Beatrice Satiat Jeunermaitre, (2007). *Plant Cell Biology: A Practical Approach.* Oxford University Press. USA.
- John Dawey & Mike Lord, (2013) *Essential Cell Biology: A Practical Approach.* Oxford University Press. USA.

E - Resources

- https://epgp.inflibnet.ac.in/
- https://www.vlab.co.in/
- https://vlab.amrita.edu/?pg=topMenu&id=1
- https:///C:/Users/CSLAB/Downloads/CellBiologyPracticalManual_ContentList.pdf
- https://www.bjcancer.org/Sites_OldFiles/_Library/UserFiles/pdf/Essential%20Cell%20Biology,Volume%202.pdf

BIOMOLECULES
UBCM203

Semester : II **Credit: 6**
Category : Major Core III/DSC – III **Hour/Week: 6**
Class & Major : I B.Sc. Biochemistry **Total Hour: 78**

Objectives:
To enable the students

- Understand the Structure of Biomolecules Associated with Life Processes.
- Elucidate the Roles of Biomolecules in the Functioning of Living Cells.
- Provide Sufficient Knowledge about the Structure, Properties and Roles of Carbohydrates, Proteins, Lipids, Nucleic Acids, Vitamins and Minerals.

Learning Outcomes:
On Completion of the course, the students will be able to

- Knowledge on Carbohydrates and its Biological Significance.
- An in Depth Understanding on the Basic Properties, Mechanisms and Significances of Biological Proteins.
- Information about All Lipids and Their Biological Significance.
- Gain Clear Idea on the Types, Structure and Biological Functions of Nucleic Acids
- Aware of the Importance of Vitamins and Minerals in Biological Systems.

UNIT- I CARBOHYDRATES **16 Hour**

Classification of Carbohydrates, Physical Properties - Stereo and Optical Isomerism, Anomeric form and Mutarotation. Structure, Properties, Occurrence and Biomedical Importance of Mono, Di and Oligosaccharides. Polysaccharides - Chemistry and Functions. Homopolysaccharides - Starch, Glycogen and Cellulose. Heteropolysaccharides - Hyaluronic Acid, Chondroitin Sulfate and Heparin. Mucopolysaccharides (Proteoglycans, Glycosaminoglycans).

UNIT- II PROTEINS AND AMINOACIDS **17 Hour**

Amino Acids: Structure, Classification, Physical and Chemical Properties. Peptide Bond, Peptide Synthesis, Biologically Important Peptides - Structure and Function (Insulin, Glutathione, Vasopressin). Protein - Introduction, Physical and Chemical Properties, Classification Based on Solubility, Shape, Composition and Function. Protein Functions - Nutrition: Science and Everyday Application. Structure of Protein - Primary, Secondary, Tertiary and Quaternary Structure of Protein.

UNIT - III LIPIDS **15 Hour**

Definition, Classification of Lipids, Simple, Compound and Derived. Simple Lipids - Physical and Chemical Properties of Fats. Characterization of Fat - Saponification Number, Acid Number, Iodine Number and RM Number. Compound Lipids - Structure and Function of Phospholipids, Glycolipids and Lipoproteins. Derived Lipids - Fatty Acids - Saturated and Unsaturated. Essential Fatty Acids and Functions of Fatty Acids. Steroids - Structure and Functions of Cholesterol.

UNIT - IV NUCLEIC ACIDS **15 Hour**

Nature of Nucleic Acids, Structure of Purines, Pyrimidines, Nucleosides and Nucleotides. Structure and Functions of DNA, Types of DNA - A, B and Z Forms; Structure and Functions of RNA and its Types. Properties - Denaturation, Renaturation, Tm, Hypo & Hyperchromicity, Nucleosome and Histones.

UNIT - V VITAMINS AND MINERALS **15 Hour**

Vitamins - Definition and Classification. Source, Structure and Biological Role, Daily Requirement and Deficiency Manifestation of the Fat Soluble Vitamins and Water Soluble Vitamins.

Minerals: Mineral Requirement, Essential Macro Minerals and Essential Micro Minerals, Sources and Functions.

Text Books

- Murray, R.K. Granner, D.K. Mayes, P.A. Rodwell, V.W. (2016). *Harper's Biochemistry.* McGraw Hill. (25th Ed.).
- Jain, J.L. Sunjay Jain. Nitin Jain. (2008) *Fundamentals of Biochemistry.* S. Chand Publication.
- Satyanarayan, V. Chakrapani, V. (2007). *Essentials of Biochemistry*. Kolkota, Books & Allied.

Reference Books

- Lubertstryer, (2019). *Biochemistry*. W.H.Freeman and Company. (9th Ed.).
- Nelson, D.L. and Cox, M.M. (2013) *Lehninger: Principles of Biochemistry*. W.H. Freeman and Company. (9th Ed.). New York.
- Devlin, T.M. John Wiley & Sons, Inc. (2011). *Textbook of Biochemistry with Clinical Correlations.* (7th Ed.). New York.

E- Resources

- https://epgp.inflibnet.ac.in/
- https://nptel.ac.in/courses/102/105/102105034/
- https://www.mooc-list.com/course/biochemistry-biomolecules-methods-and-mechanisms-edx
- https://books.google.co.in/books?id=P3TWDwAAQBAJ&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false

QUALITATIVE ANALYSIS OF BIOMOLECULES
UBCR202

Semester : II **Credit : 5**
Category : Core practical II **Hour/Week : 5**
Class & Major : I B.Sc. Biochemistry **Total Hour : 65**

Objectives:
To enable the students

- Analyze the Presence of Sugar, Amino Acids, Proteins and Lipids through Qualitative Test.

Learning Outcomes:
On Completion of the course, the students will be able to

- Understand the Importance of Qualitative Test in the Laboratory for Diagnoses.
- Acquire Skill to Perform the Experiment in the Real Lab.
- Analyze the Tests for Carbohydrates, Amino Acids, Proteins and Lipids.

QUALITATIVE ANALYSIS

1. ANALYSIS OF CARBOHYDRATES **20 Hour**

Colour Reactions of Sugars and Osazone Test.

a) **Monosaccharides:**
Pentoses - Ribose
Hexoses - Glucose, Fructose, Galactose and Mannose.

b) **Disaccharides:**
Sucrose, Maltose and Lactose.

c) **Polysaccharides:**
Starch and Dextrin.

2. ANALYSIS OF AMINOACIDS **15 Hour**

Colour Reactions of Amino Acids Such as

- Tyrosine
- Tryptophan
- Arginine
- Histidine
- Proline
- Cysteine
- Methionine

3. ANALYSIS OF PROTEINS **15 Hour**

Egg albumin - Solubility, Biuret, Millons, Xanthoproteic.

4. ANALYSIS OF LIPIDS **15 Hour**

Lipids - Solubility, Iodine Test, Acrolein test, Salkowski's Test, Liebermann Burchard Test.

Reference Books

- Dr. Jayaraman, J. (2011). *Manuals in Biochemistry*. New Age International Pub. Bangalore.
- Plummer. (2000). *Practical Biochemistry*. Tata Mcgraw Hill Publishing Company. New Delhi.
- Sadasivam, S. Manickam, V.A. *Biochemical Methods*. New Age International Publishers.
- Anil Kumar. Sarika Garg. Neha Garg. (2012). *Biochemical Tests - Principles and Protocols*. Vinod Vasishtha Viva Books Pvt Ltd.

E - Resources

- https://epgp.inflibnet.ac.in/
- https://www.sciencedirect.com/book/9780128009697/introductory-experiments-on-biomolecules-and-their-interactions
- https://vlab.amrita.edu/?pg=topMenu&id=1

MICROBIOLOGY

UMBA202

Semester : II **Credit: 2**
Category : Allied II/GE - II **Hour/Week: 3**
Class & Major : I B.Sc. Biochemistry **Total Hour : 39**

Objectives:

To enable the students

- Understand the Different Types of Microbes.
- Gain Theoretical Knowledge about the Microbes Present in the Environment, Infectious Microbes and Microbes Used In Industry.

Learning Outcomes:

On Completion of the course, the students will be able to

- Gain Knowledge on Different Types of Microbes and Culture Media.
- Aware about Common Microbes and its Taxonomy.
- Identify the Common Infectious Agents and the Diseases that they Cause.
- Explain the Use of Microbes in the Industry and its Process.

UNIT - I INTRODUCTION **8 Hour**

History and Scope of Microbiology - Prokaryotes and Eukaryotes - Bacteria, Fungi, Algae, Protozoa and Viruses - Structure and Functions of the Cellular Components - Growth and Nutrition - Media and Culture.

UNIT - II CLASSIFICATION OF MICROBES **8 Hour**

Classification of Microbes - Numerical Taxonomy - Molecular Taxonomy - Methods of Microbial Identification. Gram Positive and Gram Negative Bacteria.

UNIT - III ENVIRONMENTAL MICROBIOLOGY **8Hour**

Microbiology of Soil - Normal Microflora - Role of Soil Microbes in Biogeochemical Cycles (C,N,S). Microorganisms in Agricultural Waste Water Treatment, Vermiculture, Microbial Pesticides. Biogeochemical Importance of Bacteria in Marine & Freshwater Ecosystems.

UNIT - IV MEDICAL MICROBIOLOGY **8 Hour**

Sterilization and Disinfection. Disease Reservoirs - Epidemiological Terminologies, Infectious Disease Transmissions. Respiratory Infection Caused by Bacteria and Viruses; COVID - 19 Pandemic Diseases, Tuberculosis, AIDS, Water Borne Diseases. Antimicrobial Agents, Antibiotics - Penicillins and Cephalosporins, Broad Spectrum Antibiotics.

UNIT - V INDUSTRIAL MICROBIOLOGY **7 Hour**

Industrial Use of Microbes - Fermentors and Fermentation Technology, Industrial Production of Alcohol, Antibiotics, Aminoacids and Enzymes. Microbiology of Food - Sources of Contamination - Food Spoilage - Food Preservation Methods.

Texts Books

- Pelczar, M.J. Chan, E.C.S. King, N.R. (2001). *Microbiology - Concepts and Applications*. Tata McGraw Hill. New Delhi.
- Ananthanarayan, R. and Paniker, C.K.J. (2000). *A Text Book of Microbiology.* Orient Longman Ltd. (6th Ed.). Hyderabad,

Reference Books

- Kathleen Park Talaro and Talaro, A. *Foundation in Microbiology.* McGraw Hill. (3rd Ed.). New York.
- Cappuccino, J.G and Sharman, N. *Microbiology: A Laboratory Manual.* Addition Wesley Longman Inc. (4th Ed.). New York.

E - Resources

- https://epgp.inflibnet.ac.in/
- https://onlinecourses.swayam2.ac.in/cec20_ag09/preview
- https|://onlinecourses.swayam2.ac.in/cec20_bt14/preview
- http://www.grsmu.by/files/file/university/cafedry/microbiologii-virysologii-immynologii/files/essential_microbiology.pdf
- https://libguides.com.edu/c.php?g=649592&p=4555275

MICROBIOLOGY PRACTICAL
UMBR202

Semester : II **Credit : 2**
Category : Allied practical II **Hour/Week : 3**
Class &Major : I B.Sc. Biochemistry **Total Hour : 39**

Objectives:
To enable the students

- Learn & Practice in a Microbiology Laboratory.
- Obtain Culture, Identify and Explain Microorganisms in Environmental Cultures**.**

Learning Outcomes:
On Completion of the course, the students will be able to

- Summarize the Fundamental Insights to Exploit Microbes for Manufacturing of Products Which Have Huge Industrial Significance.
- Integrate Various Biochemical Processes to Obtain Products Such as Food, Chemicals, Vaccines, Medicine.
- Analyze the Role of Microbes in Industry Using Technology.
- Learn Different Types of Pure Culture Techniques, Preservation of Pure Culture and Culture Collection Centers.
- Isolate Cultures in Pure form and Preserve Cultures for Further Use in Research Studies.

Experiments

1. Use of Microscope, Principle of Fixation and Staining
2. Preparation of Microbiological Media.
3. Dispose of Microbes - Control of Microbial Contamination by Sterilization Techniques.
4. Identification of Microbes through Staining by Simple & Differential Methods
5. Microbial Pure Culture by Isolation Techniques.
6. Identification and Enumeration of Microorganisms from Soil.
7. Determination of Growth Pattern by Growth Curve Methods.
8. Biosafety in Microbiological and Biomedical Laboratories

Reference Books

- Kathleen Park Talaro. Talaro, A. (2010). *Foundation in Microbiology.* Mc Graw Hill. (2nd Ed.). New York.
- Cappuccino, J.G. Sharman, N. (2005) *Microbiology*: *A Laboratory Manual.* Addition Wesley Longman Inc. New York.
- Daniel Lim. (2015). *Microbiology*. McGraw-Hill. New York.

E- Resources

- file:///C:/Users/CSLAB/Downloads/microbiologylabmanual.pdf
- https://www.routledge.com/Practical-Handbook-of-Microbiology/Green-Goldman/p/book/9780367567637
- https://vlab.amrita.edu/?sub=3&brch=76

NUTRITION AND HEALTH
UBCE204

Semester : II **Credit : 2**
Category : Non major elective/SEC **Hour/Week : 3**
Class &Major: I UG **Total Hour : 39**

Objectives
To enable the students:

- Understand the Nutrients in Foods and the Specific Functions in Maintaining Health.
- Obtain Knowledge of Nutrients and their Nutritional Value.
- Learn about Various Food Preservation Process.

Learning Outcomes:
On Completion of the course, the students will be able to

- Define Nutrition and its Function in Maintaining Good Health.
- Describe the Importance of Nutrients.
- Gain Knowledge on Diet and Diet Therapy.
- Aware About the Chemistry and Applications of Food Enzymes, Additives and Flavor.

UNIT – I INTRODUCTION **7 Hour**

Introduction to Nutrition - Food as a Source of Nutrients, Functions of Foods, Adequate, Optimum and Good Nutrition, Malnutrition; Inter Relationship Between Nutrition and Health Visible Symptoms of Good Health.

UNIT – II NUTRIENTS **7 Hour**

Digestion, Absorption, Transport and Utilization of Nutrients in the Body - Carbohydrates, Fats and Oils, Proteins, Vitamins and Minerals.

UNIT – III NORMAL DIET **8 Hour**

Role of Dietician - Hospital and Community; Basic Concepts in Diet Therapy; Therapeutic Adaptation of the Normal Diet; Routine Hospital Diets - Regular Diet, Light Diet, Soft Diet, Full Liquid Diet and Tube Feeding.

UNIT – IV DIET THERAPY **8 Hour**

Therapeutic Diets for the Following Disorders - Underweight - Definition, Etiology, Treatment; Obesity - Definition, Etiology, Treatment; Diseases of Gastrointestinal Tract Disorder; Peptic Ulcer, Constipation, Acute and Chronic Diarrhea. Hepatitis in Liver.

UNIT – V FOOD PRESERVATION **9 Hour**

Biochemical Constituents of Food Grains, Fruits and Vegetables; Changes during Processing and Preservation; General Principles and Method of Food Preservation; Preservation with Chemicals - Mechanism of Microbial Inhibition, Inorganic Preservatives, Antibiotics, Mold Inhibitors and Antioxidants.

Text Books

- Swaminanthan, M. (2004). *Essentials of Food and Nutrition.* Bappco Publication.
- Davidson Passmore. (2015). *Human Nutrition and Dietetics.* Bappco Publications.
- Garrow, J.S. Philip, W. James, T. Ralph, A. (2000). *Human Nutrition and Dietetics.* (10th Ed). Churchill Livingstone.

Reference Books

- Swaminanthan. (2006). Principle *of Nutrition.* Bappco Publication.
- Robinson Cornnell. (2001). Normal *and Therapeutic Nutrition.* Bappco Publication.
- Michael, J. Gibney. Ian, A. Macdonald. Helen, M. Roche. (2004). *Nutrition & Metabolism.* Blackwel Publishing Ltd.

E - Resources

- https://epgp.inflibnet.ac.in/
- http://www.freebookcentre.net/medical_books_download/Biology-of-Human-Nutrition.html
- http://faculty.sdmiramar.edu/faculty/sdccd/mmcmahon/nutrition/#

BIOMEDICAL TECHNIQUES

UBCE202

Semester : I **Credit : 2**
Category : Non major elective **Hour/Week : 4**
Class & Major : II UG **Total Hour : 52**

Objectives

To enable the students:

- Study the Different Techniques Employed in Biochemistry and its Importance.
- Experiment the Techniques in Sample Analysis.

Learning Outcomes:

On Completion of the course, the students will be able to

- Describe the Methodology & Applications Involved in Biotechniques.
- Demonstrate Knowledge and Practical Skills of Using Instruments in Biology and Medical Field
- Perform Techniques Involved in Molecular Biology and Diagnosis of Diseases.
- Demonstrate Competency in the Ability to Work Well Both Independently and Collaboratively and to Conduct, Analyze, Report Research Findings.
- Utilize a Standardized Approach in Determining Health and Social Factors Influencing Treatment in Women and Apply to an Individual Patient.

UNIT -I BASICS IN LABORATORY TECHNIQUES **12 Hour**

Instrumentation to Laboratory Equipments and Basic Laboratory Operation and Role of Lab Technician, Types of Specimen Collection, and Collection Procedure - Blood and Urine. Unit of Measurement, Reagent Preparation and Laboratory Calculation - Metric System.

UNIT -II SEROLOGY **10 Hour**

Blood Pressure, Pulse, Clotting Time, Bleeding Time, Hb Estimation, Total Count - RBC, WBC, Differential WBC Count, ESR and Haematocrit Value.

UNIT- III BLOOD COLLECTION AND GROUPING **10 Hour**

Blood Grouping and Rh Factors. Blood Collection, Screening Test - HIV, Hbs Ag. Blood Grouping, Cross Matching, Incompatible Blood Transfusion.

UNIT – IV HISTOPATHOLOGY **10 Hour**

Brief Outline of Histopathology, Tissue Cutting, Fixation Embedding Tissue Slicing by Microtome, Slide Mounting and Staining Techniques.

UNIT – V BIOCHEMICAL ANALYSIS **10 Hour**

Techniques of Measuring: Blood Glucose, Urea, Uric Acid, TG, AST, ALT, ALP, ACP, Cholesterol and Total Protein.

Text Books

- Ambika Shanmugam. (2010). *Fundamentals of Biochemistry for Medical Students.* Published by the Author.

Reference Books

- Mukherjee, L. (2009). *Medical Laboratory Technology.* Tata McGraw - Hill Publishing Company Limited. (15th Ed.).
- Talib, H. (2008). *Medical Laboratory Technology*. McGraw - Hill Publishing Company Limited.

E - Resources

- https://epgp.inflibnet.ac.in/
- https://www.amazon.in/Textbook-Biomedical-Laboratory-Techniques-ebook/dp/B071D3V5CB
- https://www.amazon.in/Theories-Techniques-Biomedical-Field-Biomed-ebook/dp/B083H1W812

WOMEN'S HEALTH, NUTRITION & DISORDERS

UBCE502/UBCE204

Semester : II **Credit : 2**
Category : NME **Hour/Week: 4**
Class &Major: II UG **Total Hour:52**

Objectives:

To enable the students

- Study the Physiological Changes that Occurs during the Women's Life.
- Awareness on Anaemia and about Various Diseases Due to Hormone Imbalance.

Learning Outcomes:

On Completion of the course, the students will be able to

- Develop the Skills Necessary for Lifelong Learning in the Area of Women's Health.
- Describe Women's Health from a Biopsychosocial Perspective that Includes the Biologic, Social, Economic, Political, and Spiritual Determinants of Health.
- Utilize Information Regarding Ethnic, Socioeconomic, Cultural, Physiologic and Psychosocial Factors in Developing Individual Care Plans for the Provision of Care in Women.
- Identify Treatment Options and Demonstrate Differences in Treatment of Pregnant Vs. Non Pregnant Women.
- Identify the Gestational Weeks When the Embryo Fetus is Most Vulnerable to Drug Induced Injury and Explain the Rationale for this.

UNIT - I WOMEN'S HEALTH **10 Hour**

Women Health - Definition, Concept, Stages of Women Life - Child Hood, Adolescence, Young Women, Middle Age, Elderly Women, Physical & Psychological Changes, Steps to Follow Healthy Life Style.

UNIT - II PUBERTY **10 Hour**

Puberty - Definition, Stages of Development of Secondary Sexual Characteristics, Factors Affecting the Onset of Puberty - Genetic Factors, Psychological Factors, Geographical Location, Nutritional Status, Normal & Abnormal Influence of Hormone on Reproductive System.

UNIT – III PREGNANCY & LACTATION **10 Hour**

Pregnancy - Definition, Stages of Pregnancy, Role of Hormones During Pregnancy, Influence of Drugs During Pregnancy, Parturition, Lactation, Importance of Breast Feeding, Precaution During Pregnancy & Lactation.

UNIT - IV DISORDERS **12 Hour**

Menstrual Cycle, Role of Hormone in Menstrual Cycle, Menstrual Disorders, Premenstrual Syndrome, PCOD, Endometrioses, Mennorhoea, Dysmennorohea, Amennorhoea, Risk Factors of Hormone Replacement Therapy - Heart Attack, Breast Cancer, Stroke. Osteoporosis - Sign & Symptoms of Osteoporosis, Treatment for Osteoporosis.

UNIT - V ANAEMIA **10 Hour**

Anaemia - Definition, Types of Anaemia - Iron Deficiency, Microcytic & Macrocytic Anaemia, Aplastic Anaemia, Sickle Cell Anaemia, Vitamin Deficiency Anaemia, Anaemia During Chronic Infection & Pregnancy Signs & Symptoms of Anaemia, Diagnosis, Treatment & Prevention.

Text Books

- Guyton, Arthu. C. (2001). *Textbook of Medical Physiology.* Philadelphia, W.B. Saunders. (8^{th} Ed.).
- Sembulingam, K. Prema Sembulingam. (2006). *Essentials of Medical Physiology.* Publication. Jaypee Brothers. New Delhi.

Reference Books

- Hillman, R.S. Kennet Ault. (2010). *Hematology in Clinical Practice.* McGraw-Hill. (5^{th} Ed.). New York.
- Paulman, P. et al. (2011). *Conn's Current Therapy.* Philadelphia Saunders.

E - Resources

- https://epgp.inflibnet.ac.in/
- https://www.elsevier.com/books/women-and-health/goldman/978-0-12-288145-9
- https://www.routledge.com/Optimizing-Womens-Health-through-Nutrition/Thompson-Ward/p/book/9780367388133

MUSHROOM CULTIVATION

UBCE304 /UBCE208

Semester : III **Credit : 2**
Category : Non Major Elective **Hour/Week : 4**
Class & Major: II UG **Total Hour : 52**

Objectives:

To enable the students

- Cite Ideas on Types and Importance of Mushroom.
- Express the Intricacies of Mushroom Cultivation.
- Practice Cultivation by Set Up of Own Unit.

Learning Outcomes:

On Completion of the course, the students will be able to

- Knows the Most Important Kinds of Substrata for Mushroom Cultivation, Belonging to the Wastes of Agricultural, Silvicultural and Forest Industry Management and Have Skills to Prepare Media for the Mushroom Cultivation from these Wastes;
- Can Determine the Most Important Species of Cultivated Mushrooms and Knows the Basic Ways of the Cultivation of Each of them.
- Appreciate the Importance of Embarking on Self - Employment and has Developed the Confidence and Personal Skills for the Same

UNIT- I INTRODUCTION TO MUSHROOMS AND ITS LIFE CYCLE 9 Hour

History of Mushroom Cultivation. Morphology, Classification - Edibile and Poisonous Mushrooms. Wild and Cultivated Mushrooms**.** Life Cycle of *Agaricus Spp*, Characteristics and Importance of *Volvariella Spp., Pleurotus Spp., Calocybe Spp.,* and *Lentinus Spp.*

UNIT- II CULTIVATION AND BIOLOGICAL IMPORTANCE 9 Hour

Conditions for Tropical and Temperate Countries - Isolation, Spawn Production, Growth Media, Spawn Running and Harvesting of Mushrooms. Medicinal and Nutritional Value of Mushrooms. Composting: Importance in Waste Recycling.

UNIT- III DISEASES AND POST HARVEST TECHNOLOGY 8 Hour

Diseases and Pest Affecting Mushroom. Post Harvest Technology: Refrigeration - Freeze Drying, Drying, Canning, Irradiation and Entrepreneurship.

UNIT- IV MUSHROOM CULTIVATION (PRACTICALS) 20 Hour

Bed and Shed Preparation, Sowing Seedlings, Pest Control, Fumigation and Harvesting.

UNIT- V MUSHROOM RECIPIES (PRACTICALS) 6 Hour

Mushroom Soup, Mushroom Pickle, Mushroom Pulav, Mushroom Chips

Text Books

- Nita Bahl. (2009). *Hand Book of Mushroom.* Vijay Primlani for Oxford Publication Co. Pvt Ltd. (4th Ed.). New Delhi.
- Nair, M.C. Gokulapalan, C. Lulu Das. (2008). *Topics on Mushroom Cultivation.* Scientific Publishers. (3rd Ed.). Jodhapur. India.

Reference Books

- Chang, T.S. Hayes, W.A. (2007). *The Biology and Cultivation of Edible Mushrooms.* Academic Press. (2nd Ed.). New York.
- Ignacimuthu, S. (2008). *Applied Plant Biotechnology.* Oxford & IBH Publishing Co. Pvt. Ltd. (3rd Ed.). New Delhi.

E - Resources

- https://epgp.inflibnet.ac.in/
- https://www.amazon.in/Mushroom-Cultivation-Illustrated-Growing-Mushrooms-ebook/dp/B07CZT44QP
- https://www.amazon.in/Mushroom-Cultivation-Completed-Updated-Mushrooms-ebook/dp/B083D8RF1C

CLINICAL DIAGNOSTICS

UBCE209

Semester : II **Credit : 2**
Category : Non Major Elective **Hour/Week : 4**
Class & Major: II UG **Total Hour : 52**

Objectives:

To enable the students

- Gain Knowledge in Basic Biochemistry and in their Applications to Human Health.
- Interpret the Disease at an Earlier Stage.
- Acquire a Thorough Knowledge of Normal and Abnormal Biochemistry and to Apply this Knowledge to the Understanding of Human Disease.
- Work Effectively in a Health Care Organization.

Learning Outcomes:

On Completion of the course, the students will be able to

- Knows How to Access Decision Support Tools and Checklists in Real Time to Assist in Formulating an Appropriate Differential Diagnosis.
- Discuss Preparation, Care and Aftercare of Patients Having Ultrasound, Cardiovascular, CT, MRI And RNI Examinations and Procedures.
- Identify the Measurements that are Made in Routine Examinations.

UNIT – I DISORDERS OF CARBOHYDRATE METABOLISM **12 Hour**

Diabetes Mellitus - Causes, Types, Complications and Treatment. GTT. Difference between Diabetes Mellitus and Diabetes Insipidus. Protein Calorie Malnutrition, Kwashiorkor and Marasmus - Causes, Complications and its Treatment.

UNIT – II DISORDERS OF LIPID METABLISM **10 Hour**

Abnormal Lipid Levels, Role of HDL and LDL Cholesterol, Atherosclerosis, Coronary Heart Disease, Heart Attack, Obesity and its Complications.

UNIT – III HORMONAL IMBALANCE **10 Hour**

Menstrual Cycle, Irregular Menstrual Cycle, Hormonal Imbalance, PCOD and its Effects, Causes, Detection and its Treatment.

UNIT – IV KIDNEY DISORDERS **10 Hour**

Kidney Structure, Function, Kidney Stones, Difference between Kidney and Gall Stones, Chronic Renal Failure - Causes, Symptoms and its Treatment.

UNIT – V BLOOD AND BMI **10 Hour**

Blood Pressure and its Regulation, Normal and Abnormal Levels, Blood Grouping (ABO & Rh), BMI and its Role.

Text Books

- Chatterjea, M.N. Rana Shinde. (2008). *Textbook of Medical Biochemistry.* Jaypee Publications.
- Mukherjee. (2004). *Medical Laboratory Techniques.* Tata McGraw - Hill Publishing Company Limited. (15th Ed.).

Reference Books

- Swaminanthan. (2006). Principle *of Nutrition.* Bappco Publication.
- Devlin. T.M. (2005). *Textbook of Biochemistry with Clinical Correlations.* John Wiley and Sons Publications.

E - Resources

- https://www.springer.com/gp/book/9789811376764
- https://www.kobo.com/us/en/ebook/oxford-handbook-of-clinical-diagnosis
- https://www.amazon.in/Clinical-Diagnosis-Management-Laboratory-Methods-ebook/dp/B01DSRRV26

REPRODUCTIVE BIOLOGY

UBCE210

Semester : II **Credit : 2**
Category : Non Major Elective **Hour/Week: 4**
Class & Major: II UG **Total Hour: 52**

Objectives:

To enable the students

- Gain Knowledge about Reproductive System.
- Understand the Menstrual Cycle and Identify the Changes During Menopause Stage.
- Aware of the Stages of Pregnancy, Parturition, Lactation.

Learning Outcomes:

On Completion of the course, the students will be able to

- Discuss the Structure, Function and Mode of Action of the Major Male and Female Reproductive Hormones.
- Describe the Major Changes that Occur in the Female Reproductive Tract Over the Menstrual Cycle.
- Understand Risk Factors for Cancers of the Male Reproductive Tract and Consider the Role of Hormones in their Development and Treatment.

UNIT - MALE REPRODUCTIVE SYSTEM **10 Hour**

Male Reproductive System - Primary Sex Organs, Structure and Functions of Testis and Prostate Gland, Spermatogenesis, Semen and its Composition, Disorders - Hypergonadism, Hypogonadism.

UNIT - II FEMALE REPRODUCTIVE SYSTEM **10 Hour**

Female Reproductive System - Primary Sex Organs, Structure and Functions of Ovary, Ovulation, Oogenesis, Disorder - Polycystic Ovarian Disorder, Family Planning - Pills, Condoms, Intrauterine Devices.

UNIT - III MENSTRUAL CYCLE **12 Hour**

Puberty, Menstrual Cycle - Definition, Changes during Menstrual Cycle - Ovarian and Uterine. Regulation of Menstrual Cycle, Menopause - Causes and Changes.

UNIT - IV FERTILIZATION AND PREGNANCY **10 Hour**

Pregnancy - Definition, Types, Stages and Metabolic Changes during Pregnancy. Fertilization - Infertility in Male and Female.

UNIT - V PARTURITION AND LACTATION **10 Hour**

Gestation Period, Parturition Stages, Placenta - Introduction, Function. Lactation - Milk Secretion, Milk Ejection**.**

Text books

- Sastry K.V. (2017). *Endocrinology and Reproductive Biology*. Rastogi Publications.
- Sembulingam. K Prema Sembulingam. (2009). *Essentials of Medical Physiology.* Jaypee Brothers. (2nd Ed.). New Delhi.

Reference books

- Richard, E. Jones., Kristin, H. Lopez. (2016). *Human Reproductive Biology.* (3rd Ed.).
- Chatterjea, C.C. (Vol I & Vol II). (2006). *Human Physiology.* Medical Allied Agency. (11th Ed.).

E - Resources

- https://bookboon.com/en/introduction-to-clinical-biochemistry-ebook.
- https://www.kobo.com/us/en/ebook/clinical-biochemistry-e-book
- https://www.elsevier.com/books/human-reproductive-biology/jones/978-0-12-382184-3

III & IV EVALUATION COMPONENTS OF CIA

Semester	Category	Course Code	Course Title	Component III	Component IV
I	Core I/ DSC - I	UBCM108	Basics of Biochemistry	Open book test	Group Discussion
	Core II/DSC -II	UBCM107	Cellular Biology	Album Preparation	Assignment
II	NME/SEC	UBCE202	Biomedical Techniques	Assignment	DPA+ Practical Test
		UBCE204	Nutrition & Health	Diet Chart Preparation	Case Study
	Core III/ DSC III	UBCM203	Biomolecules	Model Preparation	Assignment
	Allied II/GE II	UMBA202	Microbiology	Food contamination Identification - Exhibits	Culture Preparation

PROGRAMME PROFILE OF M.Sc., BIOCHEMISTRY

PROGRAMME SPECIFIC OUTCOMES (PSO)

Upon completion of the Programme, the students will be able to

- Recognize, Demonstrate and Understand the Structure, Chemical Properties and Reactions of Biomolecules and their Biopolymer Structure to Predict Chemical Properties and Reactivity.
- Acquire Deep Scientific Knowledge in Subjects Like, Cell Biology, Molecular Biology, Biotechnology, Endocrinology, Enzymology, Genetics & Genetic Engineering and Clinical Biochemistry.
- Acquire Knowledge about the Qualitative & Quantitative Analysis of Different Molecule Using Different Types of Microscopes, Chromatographic Techniques, Spectroscopic, Radioisotopes and Electrophoresis Techniques.
- Detect Various Disorders and Identify the Defect in the Metabolic Pathways and Evaluate Solutions for Metabolic Disorders by Applying the Knowledge of Metabolism.
- Translate the Knowledge of Biochemistry to Address Environmental, Intellectual, Societal and Ethical Issues through Projects.

Semester	Category	Course code	Course title	Previous course code	Contact Hour / Week	Credit
						Min/Max
I	Core I / DSC I	PBCM107	Bimolecular Chemistry	PBCM101	6	4
	Core II / DSC II	PBCM108	Cell Biology	PBCM102	6	4
	Core III / DSC III	PBCM109	Microbiology	PBCM203/ 105	6	4
	Core IV / DSC IV	PBCM110	Molecular Biology	PBCM204/ 106	6	4
	Core Practical I	PBCR103	Microbiology and Molecular Biology Practical	PBCR201/ 102	6	5
				TOTAL	**30**	**21**
II	Core V/ DSC V	PBCM207	Metabolism & Regulation	PBCM201	5	4
	Core VI / DSC VI	PBCM208	Human Physiology	PBCM202	5	4
	Core VII/ DSC VII	PBCM209	Analytical Biochemistry	PBCM103/ 205	5	5
	Core VIII/ DSC VIII	PBCM210	Endocrinology	PBCM104/ 206	4	4
	Core Practical II	PBCR203	Analytical Biochemistry Practical	PBCR101/ 202	6	5
	Core IX/ DSC IX	PBCX201	Mushroom Cultivation (Service Learning)	-	-	1
	NME /SEC				5	4
	Online Course	PMAS201	Spoken Tutorial/NPTEL	-	-	-/2
				TOTAL	**30**	**27/29**

III	Core X/ DSC X	PBCM305	Enzymology and Enzyme Technology	PBCM301	6	5
	Core XI/ DSC XI	PBCM306	Immunology	PBCM303	6	5
	Core XII / DSC XII	PRMC301	Research Methodology	PBCM304	5	4
	Core Practical III	PBCR302	Enzymology & Clinical Diagnostics	PBCR301	6	5
	Core XVI / DSC XVI	PBCP401	Project	-	2	-
	Core XIII / DSC XIII	PBCI302	Plant Biochemistry& Industrial Biotechnology	PBCI301	5	4
				TOTAL	**30**	**23**
IV	Core XIV / DSC XIV	PBCM403	Genetics & Genetic Engineering	PBCM401	6	5
	Core XV / DSC XV	PBCM404	Advanced Clinical Biochemistry	PBCM402	6	5
	Core XVI/ DSC XVI	PBCP401	Project	-	18	9
				TOTAL	**30**	**19**
				GRAND TOTAL	**120**	**90/92**

COURSES OFFERED TO OTHER DEPARTMENT
NON MAJOR ELECTIVE

Semester	Category	Course code	Course Title	Previous course code	Contact Hour/ Week	Credit	
						Min.	Max.
II	Non Major Elective	PBCE204	Pharmaceutical Biochemistry	PBCE101/201	5	4	4
		PBCE202	Reproductive Biology & Disorders	PBCH102			
		PBCE203	Modern Lifestyle Associated Diseases	PBCE103			

BIOMOLECULAR CHEMISTRY

PBCM107

Semester : I **Credit : 4**
Category : Core I/ DSC I **Hour/Week: 6**
Class &Major : I M.Sc. Biochemistry **Total Hour: 78**

Objectives:

To enable the students

- Emphasizes on Various Biomolecules and its Structure.
- Learn about the Significance of the Complex Biomolecules, Polysaccharides, Lipids, Proteins, Nucleic Acids, Vitamins, Etc.

Learning Outcomes:

On Completion of the course, the students will be able to

- Understand about Organization of Homo and Heteroglycans.
- Gain Clear Knowledge on Aminoacids and Protein Characterization.
- Evaluate the Structure and Hierarchical Organization of Nucleic Acids With their Biological Function.
- Acquire Knowledge on Various Accessory Molecules Like Vitamins Porphyrins.
- Interpret the Role of Various Biological Structures in Cell to Cell Interaction.

UNIT - I CARBOHYDRATES - HOMO AND HETEROGLYCANS 15 Hour

Classification, Chemical Properties of Carbohydrates, Chemistry and Biological Roles of Homo and Heteropolysaccharides. Structural Elucidation of Polysaccharides; Oligosaccharides - Lectin Interaction in Biochemical Processes. Structure and Role of Proteoglycans, Glycoproteins and Glycolipids (Gangliosides and Lipopolysaccharides).

UNIT - II AMINO ACIDS & PROTEINS 16 Hour

Amino Acids - Classification, Structure and Physiochemical Properties, Chemical Synthesis of Peptides - Solid Phase Peptide Synthesis. Proteins - Classification, Purification and Criteria of Homogeneity. Structural Organization, Sequence Determination and Characterization of Proteins. Conformation of Proteins - Ramachandran Plots. Denaturation and Renaturation of Proteins. Apoprotein and Prosthetic Group - Porphyrins - Structure and Properties of Porphyrins - Heme, Chlorophyll and Cytochromes.

UNIT - III NUCLEIC ACIDS 16 Hour

Watson - Crick Model of DNA Structure. A, B And Z - DNA Cruciform Structure in DNA, Formation and Stability of Cruciforms, Miscellaneous Alternative Conformation of DNA, Slipped Mispaired DNA, Parallel Stranded, Anisomorphic DNA, Palindrome, Secondary and Tertiary Structure of RNA, Methods for Nucleic Acid Sequence Determination, Molecular Hybridization, Cot Value Curve, Hypochromic Effect, DNA - Protein Interactions.

UNIT - IV LIPIDS 15 Hour

Lipids - Classification - Saturated and Unsaturated Fatty Acids, Phospholipids - Classification, Structure and Functions. Ceramides and Sphingomyelins. Eicosanoids, Structure and Functions of Prostaglandins, Thromboxanes, Leukotrienes Types and Functions of Plasma Lipoproteins. Amphipathic Lipids - Membranes, Micelles, Emulsions and Liposomes. Steroids - Cholesterol Structure and Biological Role - Bile Acids, Bile Salts.

UNIT - V VITAMINS AND PORPHYRINS 16 Hour

Vitamins - Water Soluble - Thiamine, Riboflavin, Niacin, Pyridoxine, Folic Acid, Ascorbic Acid- Sources, Structure, Biochemical Functions, Deficiency Diseases, Daily Requirements; Fat Soluble - Vitamin A, Vitamin D2, Vitamin E And Vitamin K - Sources, Structure, Biochemical Functions, Deficiency Diseases, Daily Requirements.

Text Books

- David, L. Nelson. Michael, M. Cox. (2017). *Lehninger - Principles of Biochemistry*. W.H. Freeman and Company. (7th Ed.). New York.
- Robert, K. Murray. et. al. (2015). *Harpers Biochemistry*. Prentices Hall International. (30th Ed.).

Reference Books

- Voet. Voet. (2018). *Biochemistry*. Prentices Hall International. John Wiley & Sons. (5th Ed.).
- Champe, P.C. Richard, A.Harvey. (2017). *Lippincotts Biochemistry*. Williams & Wilkins Publishers. (7th Ed.).

Journals

- Indian Journal of Biochemistry & Biophysics.
- Indian Journal of Experimental Biology.
- International Journal of Biological Macromolecules.

E - Resources

- https://onlinecourses.nptel.ac.in/noc20_cy07/preview
- https://onlinecourses.swayam2.ac.in/cec21_bt10/preview
- https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=2
- https://shodhganga.inflibnet.ac.in
- https://epgp.inflibnet.ac.in/

CELL BIOLOGY

PBCM108

Semester : I **Credit : 4**
Category : Core II/ DSC II **Hour/Week : 6**
Class &Major : I M.Sc. Biochemistry **Total Hour : 78**

Objectives:

To enable the students

- Understand The Structure and Functions of Prokaryotic, Eukaryotic Cells and their Metabolic Process.
- Explain the Arrangement, Functions and Properties of Biomolecules in Membranes.
- Study the Role of Membrane Channels in Transportation and Different Movement Process Across the Membrane.

Learning Outcomes:

On Completion of the course, the students will be able to

- Understand the Molecular Organization of Cells, Cell - Cell Communication, Cell Junctions, Cytoskeleton and Extracellular Matrix Protein.
- Appreciate Membrane Composition and Transport Mechanisms.
- Interpret the Role of Various Biological Structures in Cell to Cell Interactions.
- Comprehend the Steps in Cell & Tissue Culture.

UNIT - I CELLULAR ORGANIZATION, DIVISION AND CYTOSKELETONS 15 Hour

Structure and Function Prokaryotic and Eukaryotic Cells. Mechanism of Cell Division - Mitosis and Meiosis, Structure and Organization of Chromatin. Phases of Cell Cycle and Regulation of Cell Growth and Cell Cycle, Cell Motility - Molecular Motors, Microtubules, Structure and Composition, Microtubular Associated Proteins - Role in Intracellular Motility.

UNIT - II CELLULAR ORGANELLES **15 Hour**

Cellular Organelles - Nucleus - Internal Organization, Traffic between the Nucleus the Nucleolus and Cytoplasm, Endoplasmic Reticulum - Protein Sorting and Transport, Golgi Apparatus and Lysosomes, Morphology and Function of Mitochondria, Chloroplasts and Peroxisomes, Glyoxysomes.

UNIT - III METHODS IN CELL BIOLOGY **16 Hour**

Methods for Disrupting Tissues and Cells, Organ and Tissue Slice Techniques, Isolation of Clones, Tissue Culture Techniques (Animal and Plant), Cell Fixation - Fluid Fixatives, Freezing and Section Drying, Fixation for Electron Microscopy - Buffered Osmium Solutions, Fixation of Organic and Inorganic Substances, Staining Techniques Acid and Basic, Fluorescent and Radioactive Dyes, Staining of Lipids, Steroids, Nucleic Acids, Proteins and Enzymatic Reaction Products. Histopathological Studies - Organ Specific Morphohistological Examination, Identification of Morphological Changes Related to Pathology.

UNIT - IV CELLULAR SIGNALLING **16 Hour**

Differentiation of Cell Membrane - Microvilli, Tight Junctions, Epithelia, Bell and Sqot Desmosomes - Mechanical Function, Cell - Cell Interaction, Cell Adhesion Proteins, Cell Junctions, Tight Junctions, Cell Surface of Plant Cells and Cancer Cells. Overview of Membrane Protein - Peripheral and Integral, Molecular Model of Cell Membrane - Fluid Mosaic Model and Membrane Fluidity, Solute Transport Across Membrane - Passive Transport, Active Transport by ATP Powered Pumps, Types of Transport Systems.

UNIT - V CELLULAR AGING: CELL DEATH MEDIATED DISEASES **16 Hour**

Cell Aging and Death - Necrosis and Apoptosis. Mechanisms of Cell Death: Apoptosis; Necrosis and Autophagy - Mitochondrial and Death Receptor Pathway. Signal Transduction in Health and Disease: Cancer, Neurodegeneration, Diabetes and Obesity and Inflammation.

Text Books

- Arnold Berk, Chris A. Kaiser, Harvey Lodish, Angelika Amon, Hidde Ploegh, Anthony Bretscher, Monty Krieger and Kelsey C. Martin. (2016). *Molecular Cell Biology.* (7th Ed.) W.H. Freeman.
- James D. Watson, A. Baker Tania, P. Bell Stephen, Gann Alexander, Levine Michael and Losick Richard. (2017). *Molecular Biology of the Gene*. (7th Ed.) Pearson Education.

References Books

- Gerald Karp. (2013). *Cell and Molecular Biology by Concepts and Experiments*. (7th Ed.) John Wiley sons & Inc.
- Lodish, Berk et al. (2016). *Molecular Cell Biology*. (8th Ed.) Freeman and Co.

Journals

- Indian Journal of Biochemistry & Biophysics
- Indian Journal of Experimental Biology
- International Journal of Biological Macromolecules

E - Resources

- https://nptel.ac.in/courses/102/106/102106
- https://onlinecourses.swayam2.ac.in/cec19_bt12/preview
- https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=2
- https://shodhganga.inflibnet.ac.in
- https://epgp.inflibnet.ac.in/

MICROBIOLOGY

PBCM109

Semester : II **Credit : 5**
Category : Core III/ DSC III **Hour/Week : 6**
Class &Major: I M.Sc. Biochemistry **Total Hour : 78**

Objectives:
To enable the students

- Study the Structure and Organization of Microorganisms in Various Fields.
- Elucidate the Role of Microbes in Industrial, Clinical and Environmental Domains.

Learning Outcomes:
On Completion of the course, the students will be able to

- Understand the Basics of Microbiology Like Characterization and Classification of Microorganisms, Cultivation, Nutrition, Physiology and Growth of Microbial Cells.
- Demonstrate Various Classes and Structure of Microbes.
- Discuss Preparation and Applications of Products from Industries. Role of Microbes in Nitrogen Fixation, Purification of Water.
- Learn about Methods of Sterilization & Preparation of Various Culture Media.

UNIT - I GENERAL MICROBIOLOGY **15 Hour**

Introduction and Scope of Microbiology. Brief Study of Structure and Organization of Major Groups of Microorganisms - Archaebacteria, Cyanobacteria, Eubacteria, Fungi, Algae, Protozoa and Viruses. Culture of Microorganisms - Batch, Continuous and Pure Cultures. Control of Microorganisms - Physical, Chemical and Chemotherapeutic Agents. Preservation of Microorganisms.

UNIT - II ENVIRONMENTAL MICROBIOLOGY **16 Hour**

Microbiology of Soil - Soil Microflora, Role of Soil Microbes in Biogeochemical Cycles (C,N,S) - Marine and Fresh Water Microbiology. Contamination of Domestic and Marine Waters. Water Purification and Sewage Treatment. Microbes in Waste Water Treatments. Microbiology of Air.

UNIT - III INDUSTRIAL MICROBIOLOGY **17 Hour**

Selection of Industrially Useful Microbes. Fermentors & Fermentation Technology - Upstream Processing.

Microbial Products in Pharmaceutical and Agriculture Industry: Production, Harvest, Recovery and Uses Enzymes, Vinegar, Amino Acids, Antibiotics (Penicillins, Tetracycline), Vitamins (B2, B12), Organic Acids (Acetic Acid, Citric Acid, Alcohol) & Formulation of Biofertilizer (*Rhizobium*) and Biopesticides (*Bacillus Thruingiensis).*

UNIT - IV CLINICAL MICROBIOLOGY **15 Hour**

Epidemiology of Infectious Diseases. Bacterial Diseases of Human (Typhoid, Cholera, Syphilis, Gonorrhoea and Pertusis). Fungal Diseases of Human (Superficial, Cutaneous, Subcutaneous and Systemic Mycoses). Viral Diseases of Human (COVID-19 Pandemic Diseases, AIDS, Hepatitis, Polio, Rabies and Measles). Mycoplasmal, Chlamydial, Rickettial and Protozoan Diseases of Human. Hospital Acquired Infections.

UNIT - V MICROBIOLOGY OF FOOD **15 Hour**

Microbiology of Fermented Foods - Yoghurt, Cheese, Bread, Sauerkraut. Mushroom Farming - Use of Enzymes in Food Industry. Microbes As Foods - SCP Production Food Borne Diseases - Bacterial and Non - Bacterial. Microbiology of Food: Sources of Contamination, Food Spoilage and Food Preservation Methods. Microbial Quality and Safety - Determining Microorganisms in Food Culture, Microscopy and Sampling Methods.

Text Books

- Prescott. et al. (2017). *Microbiology.* Mcgraw Hill Education. (7th Ed.). USA.
- Joanne, M.Willey. Linda Sherwood. Christopher, J. Woolverton. (2017). *Prescott's Microbiology.* Tata McGraw Hill Publishing Company Ltd. (10th Ed.). New Delhi.

Reference Books

- Martin Alexander. (2009). *Introduction to Soil Microbiology.* Wiley International. (4th Ed.). New York.
- Gladwin. Trattler. (2013). *Clinical Microbiology Made Ridiculously Simple.* Medmaster. (6th Ed.). UK.
- Panicker. (2005). *Microbiology*. Orient Longman. Hyderabad. (6th Ed).

Journals

- Journal of Clinical Microbiology
- Applied and Environmental Microbiology Journal
- European Journal of Clinical Microbiology

E - Resources

- https://onlinecourses.nptel.ac.in/noc20_ce17/preview
- https://www.classcentral.com/course/swayam-food-microbiology-and-food-safety-17609
- https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=2
- https:/.microbiologyresearch.org
- https://shodhganga.inflibnet.ac.in
- https://epgp.inflibnet.ac.in/

MOLECULAR BIOLOGY
PBCM210

Semester : I **Credit : 4**
Category : Core IV/ DSC IV **Hour/Week : 6**
Class &Major : I M.Sc. Biochemistry **Total Hour : 78**

Objectives:
To enable the students

- Impart Knowledge about Molecular Basis for Cell Division and Replication
- Enlighten the Students about the Process of RNA & Protein Synthesis and their Segregation.
- Expose the Students to the Molecular Mechanisms of Gene Regulation.

Learning Outcomes:
On Completion of the course, the students will be able to

- Explain Nucleic Acid As Genetic Information Carriers, Possible Modes of Replication and Roles of Replication Enzymes.
- Learn about the Mechanism and Regulation of Transcription in Prokaryotes along with Reverse Transcription.
- Understand the Classes of DNA Sequences, Centromere, Telomere, Satellite DNA, Minisatellite and Applications of Satellite DNA and Split Genes.
- Analyze the Changes in Coding Sequences by Applying Genetic Code Concept.
- Comprehend Protein Targeting and the Role of Ubiquitine in Protein Degradation and Chaperons in Folding.

UNIT - I PROKARYOTIC TRANSCRIPTION AND REGULATION 16 Hour

Prokaryotic and Eukaryotic DNA Replication - Mechanism of Replication, Enzymes and Necessary Proteins in DNA Replication, Telomeres, Telomerase and End Replication. DNA Mutation and Repair - Mutation Subtypes, Mismatch, Base - Excision, Nucleotide - Excision and Direct Repair. DNA Recombination - Homologous, Non - Homologous and Site - Specific. DNA Transposition. Basic Principles of Transcription. Transcription - Initiation, Elongation and Termination. Inhibitors of Transcription. Post - Transcriptional Processing of rRNA and tRNA. Regulation of Transcription In Prokaryotes - The Lac, Trp, Arab, Gal Operon.

UNIT - II EUKARYOTIC TRANSCRIPTION AND REGULATION 16 Hour

Eukaryotic RNA Polymerases - Structure and Functions. RNA Pol I, II and III Promoters, Transcription Factors, Transcription Complex Assembly and Mechanism of Transcription. Transcriptional Regulation in Eukaryotes - Hormonal (Steroid Hormone Receptors), Phosphorylation (Stat Proteins), Activation of Transcriptional Elongation by HIV Tat Protein, Cell Determination, Homeodomain Proteins. Post Transcriptional Modification - 5' Cap Formation - 3' End Processing and Polyadenylation - Splicing- Editing- Nuclear Export of mRNA - mRNA Stability

UNIT- III GENETIC CODE, TRANSLATION 15 Hour

Genetic Code - Prokaryotic and Eukaryotic Translation - Translational Machinery. Mechanism of Initiation - Elongation and Termination. Regulation of Translation. Inhibitors of

Translation. Co - and Post - Translational Modifications. Protein Targeting. Protein Degradation: The Ubiquitine Pathway - Protein Folding - Models, Molecular Chaperones.

UNIT – IV GENE EXPRESSION AND REGULATION **15 Hour**

Levels of Gene Expression. Principles of Gene Regulation, Upregulation, Downregulation, Induction, Repression, Global and Narrow Domain Mechanisms. Genetic and Epigenetic Gene Regulation by DNA Methylation. DNA Methylation in Prokaryotes DNA Methylation in Eukaryotes - Cytosine Methylation, CpG Islands. Methylation and Gene Regulation in Mammals and Plants.

UNIT - V GENOMICS **16 Hour**

Genomics: An Overview. Genome Projects: HGP Genome Sequencing Approaches; Structural Genomics; Chromosome Maps - RFLP, SSLP, RAPD Physical Mapping. Positional Cloning. Functional Genomics - Study of Gene Interactions; Proteomics. SNPs and Implications; DNA Micro Arrays.

Text Books

- Harvey Lodish Baltimore. et.al. (2010). *Molecular Cell Biology*. (8th Ed.)
- Ajoy Paul. (2011). *Textbook of Cell and Molecular Biology*. Books and Allied Ltd.

Reference Books

- George, M.Malacinski. (2013). *Freifeder's Essentials of Molecular Biology.* Norosa Publishing House.
- Bruce Alberts. Alexander Johnson. Julian Lewis. David Morgan. Martin Raff. Keith Roberts. Peter Walter. (2014). *Molecular Biology of Cell*. Garland Science Publication.
- Watson, J.D. Tania, A. Baker. Stephen, P. Bell. Michael Levine. Richard Losick. (2013). *Molecular Biology of the Gene*. Benjamin/Cummings Publ. Co. Inc. (7th Ed.). California.

Journals

- International Journal of Genetics and Molecular Biology.
- International Journal of Biochemistry and Molecular Biology.
- Indian journal of genetics and molecular biology.

E - Resources

- https://onlinecourses.swayam2.ac.in/cec20_ma13/preview
- https://www.classcentral.com/course/swayam-molecular-biology-19952
- https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=2
- https://www.nature.com/scitable/topicpage/epigenetic-influences-and-disease-895/
- https://shodhganga.inflibnet.ac.in
- https://epgp.inflibnet.ac.in/

MICROBIOLOGY & MOLECULAR BIOLOGY PRACTICAL

PBCR103

Semester : I **Credit: 5**
Category : Core Practical I **Hour/Week: 6**
Class &Major : I M.Sc. Biochemistry **Total Hour: 78**

Objectives:

To enable the students

- Gain Practical Knowledge about Microbes.
- Experiment Molecular Biological Techniques.

Learning Outcomes:

On Completion of the course, the students will be able to

- Equipped with the Knowledge to Handle Microbes and Basic Instrumentation Used in Microbiological Laboratory.
- Various Basic Techniques to Isolate, Characterize the Microbes Morphologically Will Be Known to them.
- Differentiate the Main Types of Prokaryotes through their Grouping Abilities and List their Characteristic and Differentiating Properties

Microbiology:

1. Determination of Microbiological Techniques by Sterilization, Media Preparation, Preparation of Slants and Stabs, Pouring of Medium into Plates, Sub-Culturing.
2. Isolation of Microorganisms from Soil Collected from Different Places by Serial Dilution, Plating for Counting Colonies, Single Colony Isolation Techniques and its Preservation.
3. Examination of Microorganisms by Simple Staining, Gram Staining, Acid Fast Staining, Endospore Staining, Staining of Flagella, Staining of Capsule, Staining of Fungi, Localization of Root Nodule Bacteria by Staining.
4. Determination of Bacterial Growth Studies by Haemocytometer, Colony Counting and Bacterial Growth Curve and Generation Time.
5. Antibiotic Sensitivity Tests by Paper Disc, Cup Method and MIC Determination.
6. Bacteriological Examination of Water / Industrial Effluents

Molecular Biology:

1. Preparation of Genomic DNA from Plant Tissue by CTAB Method.
2. Plasmid DNA Isolation by Alkaline Lysis Method.
3. Isolation Of Chromosomal DNA From Blood Samples By Phenol Chloroform Method.
4. Demonstration of ELISA.

Text Books

- Cappuccino, J.G. Sharman, N. (2010). *Microbiology*: *A Laboratory* Manual. Addition Wesley Longman Inc. (3rd Ed.). New York.
- Schleif, Robert F. Wensink, Pieter. C. (2019). *Practical Methods in Molecular Biology*. (4th Ed.).

Reference Books

- Kathleen Park Talaro. Talaro, A. (2005). F*oundation in Microbiology*. McGraw-Hill. (2nd Ed.). New York.
- Sue Carson Heather Miller Melissa Srougi D. Scott Withero. (2020).*Molecular Biology Techniques: A Classroom Laboratory Manual.* (4th Ed.). Academic Press.

E - Resources

- https://www.vlab.co.in/participating-institute-amrita-vishwa-vidyapeetham
- https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=2
- https://vlab.amrita.edu/?sub=3&brch=73
- https://shodhganga.inflibnet.ac.in
- https://epgp.inflibnet.ac.in/

METABOLISM AND REGULATION

PBCM207

Semester : II **Credit : 4**
Category : Core V/ DSC V **Hour/Week: 5**
Class &Major : I M.Sc. Biochemistry **Total Hour : 65**

Objectives:

To enable the students

- Understand the Fundamental Energetics of Biochemical Processes, Chemical Logic of Metabolic Pathways.
- Impart Knowledge about the Basic Metabolic Pathway of Carbohydrates.
- Enable the Students to Understand the Inter Relationship of Carbohydrates, Proteins and Fat Metabolism.

Learning Outcomes:

On Completion of the course, the students will be able to

- Explain Biochemical Energy Generation through Carbohydrate Metabolism.
- Outline Lipid Metabolism with Respect to Several Human Diseases, Due to Defects in the Metabolic Pathway.
- Explain Energy Yielding and Energy Requiring Reactions in Life and Diversity of Metabolic Reactions in Amino Acid Pathway
- Analyse the Integration of Biochemical Process with Specific Control Sites and Key Junctions.

UNIT - I BIOENERGETICS **13 Hour**

Free Energy and Entropy. Phosphoryl Group Transfers and ATP. Enzymes Involved in Redox Reactions. The Electron Transport Chain - Organization and Role in Electron Capture. Oxidative Phosphorylation - Electron Transfer Reactions in Mitochondria. F1F0 ATPase - Structure and Mechanism of Action. The Chemiosmotic Theory. Inhibitors of Respiratory Chain and Oxidative Phosphorylation - Uncouplers, Ionophores. Regulation of Oxidative Phosphorylation. Mitochondrial Transport Systems - ATP/ADP Exchange, Malate / Glycerophosphate Shuttle.

UNIT - II CARBOHYDRATE METABOLISM **13 Hour**

Carbohydrate Metabolism: Glycolysis and Gluconeogenesis - Pathway, Key Enzymes and Co - Ordinate Regulation. Pyruvate Dehydrogenase Complex and the Regulation of this Enzyme through Reversible Covalent Modification. The Citricacid Cycle and Regulation. The Pentose Phosphate Pathway. Metabolism of Glycogen and Regulation.

UNIT - III LIPID METABOLISM **13 Hour**

Lipogenesis: Biosynthesis of Fatty Acid, Triglycerides, Phospholipids and Cholesterol. Regulation of Triacylglycerol, Phospholipids and Cholesterol Biosynthesis and Disorders. Oxidation of Lipids. Role of Carnitine Cycle in the Regulation of B - Oxidation. Ketogenesis and its Control. Lipoprotein Metabolism - Exogenous and Endogenus Pathways.

UNIT-IV METABOLISM OF AMINO ACIDS, PURINES AND PYRIMIDINES 13 Hour

Amino Acid Metabolism - Degradation of Amino Acids, Oxidative and Nonoxidative Deamination, Transamination, Decarboxylation, Detoxication of Ammonia - Urea Cycle Catabolism of Carbon Skeletons of Amino Acids - Ketogenic and Glucogenic Amino Acids. Disorders of Amino Acid Metabolism - Phenylketonuria, Alkaptonuria and Albinism Digestion and Absorption of Nucleoproteins, Metabolism of Purines - De Novo and Salvage Pathways for Purine Biosynthesis, Regulation of Biosynthesis of Nucleotides. Purine Catabolic Pathway. Hyperuricemia. Metabolism of Pyrimidines Biosynthesis and Catabolism. Orotic Aciduria.

UNIT - V METABOLIC INTEGRATION AND HORMONAL REGULATION 13 Hour

Key Junctions in Metabolism - Glucose - 6 - Phosphate, Pyruvate and Acetyl CoA. Metabolic Profiles of Brain, Muscle, Liver, Kidney and Adipose Tissue. Metabolic Inter Relationships in Various Nutritional and Hormonal States - Obesity, Aerobic, Anaerobic Endurance, Exercise, Pregnancy, Lactation, IDDM, NIDDM and Starvation.

Text Books

- Murray. et al. (2015). *Harper's Biochemistry.* (30th Ed.). Mc. Graw Hill.
- David L. Nelson, Michael M. Cox. (2017). *Lehninger - Principles of Biochemistry.* W.H. Freeman and Company. (7th Ed.). New York.

References Books

- Voet. Voet. (2018). *Biochemistry*. Prentices Hall International. John Wiley & Sons. (5th Ed.).
- Champe, P.C. Richard, A. Harvey. (2009). *Lippincotts Biochemistry.* Williams & Wilkins Publishers.

Journals

- Indian Journal of Biochemistry & Biophysics
- Biochemistry &Analytical Biochemistry
- Endocrinology &Metabolism International Journal

E - Resources

- https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=2
- https://onlinecourses.nptel.ac.in/noc21_bt18/preview
- www.ncbi.nlm.nih.gov › NCBI › Literature › Bookshelf
- http://www.ggu.ac.in/download/SWAYAM-BOOKLET%2008.08.18.pdf
- Cellular metabolism /tocrisbioscience
- https://shodhganga.inflibnet.ac.in
- https://epgp.inflibnet.ac.in/

HUMAN PHYSIOLOGY

PBCM208

Semester : II **Credit : 4**
Category : Core VI/ DSC VI **Hour/Week : 5**
Class &Major : I M.Sc. Biochemistry **Total Hour : 65**

Objectives:

To enable the students

- Gain Knowledge on Physiology of Human Body and to Study the Way the Body Functions.
- Study the Female and Male Reproductive System.
- Learn the Biochemical Changes Occurring in Pregnancy, Parturition and Lactation.

Learning Outcomes:

On Completion of the course, the students will be able to

- Understand the Fundamental Components & Functions of Digestive, Reproductive & Excretory System.
- Discuss The Importance of Cardiac and Respiratory System and to Create Awareness on Cardiovascular and Respiratory Diseases.
- Discuss the Functions of Nervous System and the Mechanism of Synaptic Transmission.
- Explain the Importance of Reproductive System.

UNIT - I BLOOD, HEARTAND RESPIRATION **13 Hour**

Internal Environment and Homeostasis- Coordinated Body Functions. Cardiophysiology - Functional Anatomy of Heart - Genesis and Spread of Cardiac Impulses - Cardiac Cycle - Heart Sound- Cardiac Output - Cardiovascular Regulatory Mechanisms - Basic E.C.G. Structure of Lungs, Mechanism and Regulation of Respiration. Transport of Blood Gases - O2 and CO2. Acid - Base Balance - Role of Buffers, Erythrocytes, Respiratory System and Kidneys. Acidosis and Alkalosis - Metabolic and Respiratory. Fluid Electrolyte Balance - Regulation of Water Balance and Sodium Balance - Role of Renin - Angiotensin and ADH.

UNIT- II DIGESTION AND EXCRETION **13 Hour**

Digestive Secretions - Composition, Functions and Regulation of Saliva, Gastric, Pancreatic, Intestinal and Bile Secretions. Digestions and Absorption of Carbohydrates, Lipids, Proteins and Nucleic Acids. Excretory System - Structure of Nephron. Formation of Urine - Glomerular Filtration, Tubular Reabsorption of Glucose, Water and Electrolytes, Tubular Secretion.

UNIT - III REPRODUCTIVE SYSTEM **13 Hour**

Male Reproductive System:- Source, Synthesis, Chemistry and Metabolism of Androgens, Physiological Roles and Mechanism of Action. Pathophysiology. Female Reproductive System: - Ovarian Steroid Hormone Synthesis, Physiological Role, Mechanism of Action, Neuroendocrine Control of Ovarian Function. Pathophysiology. Endocrinology of Pregnancy, Parturition and Lactation. Sex Differentiation and Development, Puberty and Hormone Control. Human Infertility - Reasons, Therapy and Treatment.

UNIT - IV NERVOUS SYSTEM **13 Hour**

Nerve Physiology - Structure of Neuron and Synapse - Excitability - Action Potential - Conduction of Never Impulse - Synaptic Transmission - Neurotransmitter Systems. Muscle Physiology - Skeletal and Smooth Muscle - Electrical Properties and Ionic Properties - Types of Muscle Contraction - Neuromuscular Transmission.

UNIT - V MUSCULAR AND CYTOSKELETON SYSTEM 13 Hour

Structure of Muscle Cells and Muscle Contraction, Molecular Organization of Muscle, Proteins of Contractile Element - Their Organization and Role in Contraction, Energy for Contraction. Types of Tissue. Epithelium - Organization and Types. The Basement Membrane. Bone and Cartilage. ECM Components - Collagen, Elastin, Fibrilling, Fibronectin, Laminin and Proteoglycans.

Text Books

- Sembulingam, K. (2018). *Essential of Medical Physiology.* Prema Jaypee Brothers. (8th Ed.). New Delhi.
- Chatterjee, C.C. (2020). *Human Physiology*. (13th Ed.).
- Jain, A.K. (2008). *Textbook of Human Physiology*. (4th Ed).

References Books

- Guyton and Hall. (2020). *Textbook of Medical Physiology*, (15th Ed.). Publisher: Saunders.
- Bernhard, K. Winfried, B. (2016). *Hormones and the Endocrine System: A text Book of Endocrinology*. Springer Nature Publishers.

Journals

- International Journal of Advanced Physiology and Allied Sciences
- American Journal of Physiology
- Indian Journal of Physiology and Pharmacology
- National Journal of Physiology, Pharmacy and Pharmacology

E - Resources

- https://www.coursera.org/learn/physiology
- https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=2
- https://opentextbc.ca/anatomyandphysiology/
- https://shodhganga.inflibnet.ac.in
- https://epgp.inflibnet.ac.in/

ANALYTICAL BIOCHEMISTRY

PBCM209

Semester : II **Credit : 5**
Category : Core VII/ DSC VII **Hour/Week : 5**
Class & Major : I M.Sc. Biochemistry **Total Hour : 65**

Objectives:

To enable the students

- Understand the Working Principles of Analytical Instruments.
- Explain Electrochemical Principles in Separation of Compounds.
- Inculcate the Fundamentals of Radioactivity and Microscopy

Learning Outcomes:

On Completion of the course, the students will be able to

- Obtain Necessary Knowledge to Perform Techniques Essential to Biochemistry.
- Use Appropriate Electrophoretic Method in Separation of Biomolecules.
- Apply Practically the Knowledge Acquired on Radioactivity and Microscopy in Biochemical Analysis.
- Differentiate the Principles of Paper, Ion Exchange, Gel & Affinity Chromatography.
- Explain the Instrument Components, Principles of Operation and Applications of Spectroscopy.

UNIT - I MICROSCOPY AND ELECTROCHEMICAL TECHNIQUES 13 Hour

Microscopy - Basic Principles and Applications - Light - Compound - Phase Contrast - Dark Field - Fluorescence Microscopy Scanning Electron Microscopy (SEM) - Transmission Electron Microscopy (TEM) - Scanning Tunneling Microscopy - (STM) - Confocal Microscopy. Electrochemical Techniques - Principles, Electrochemical Cells - pH Measurement, Glass Electrode, Oxygen Electrode - Principle and Application. Biosensors.

UNIT-II ULTRACENTRIFUGATION AND RADIOACTIVITY TECHNIQUES 15 Hour

Ultracentrifugation - Basic Principles. Preparative Ultracentrifugation - Differential Centrifugation and Density Gradient Centrifugation. Analytical Centrifugation - Schlieren Optical System - Applications - Determination of Molecular Mass and Purity of Macromolecules. Radioactivity - Types of Radioisotopes - Half Life - Units of Radioactivity - Uses of Radioisotopes In Life Sciences & Biotechnology - Detection and Measurement Techniques - Liquid Scintillation Counting - Solid State Counting - Geiger Counter - Radiation Hazard & Laboratory Handling Methods.

UNIT - III ELECTROPHORESIS TECHNIQUES 13 Hour

Electrophoresis - General Principles, Support Media. Electrophoresis of Proteins - SDS - PAGE, 2D - PAGE, Native Gels, Gradient Gels, Isoelectric Focusing. Cellulose Acetate Electrophoresis. Detection, Estimation and Recovery of Proteins in Gels. Protein Blotting. Electrophoresis of Nucleic Acids - Agarose Gel Electrophoresis, DNA Sequencing Gels, Pulsed Field Gel Electrophoresis.

UNIT - IV CHROMATOGRAPHY TECHNIQUES 11 Hour

Principles of Chromatography, Size Exclusion, Ion - Exchange and Affinity Chromatography. High Performance Thin Layer Chromatography (HPTLC), Gas Liquid Chromatography (GLC), Thin Layer Chromatography (TLC), Paper Chromatography, GC-MS, LC-MS, MALDI - TOF, ICPMS, HPLC And Surface Plasma Resonance Methods.

UNIT - V SPECTROSCOPY TECHNIQUES **13 Hour**

Laws of Absorption and Absorption Spectrum. Principle, Instrumentation and Applications of FTIR. Atomic Spectroscopy - Principle and Applications of Atomic Flame and Flameless Spectrophotometry. Use of Lasers for Spectroscopy.

Text Books

- Wilson. Walkers. (2018). *Principles and Techniques of Biochemistry and Molecular Biology*. Cambridge University Press.
- Upadhyay. Upadhyay. Nath. (2010). *Biophysical Chemistry Principles and Techniques*. Himalaya Publication.

References Books

- David Frifelder. (2009). *Physical Biochemistry*. W. H. Freeman. (3rd Ed.).
- Robert, D. Braun. (2010). *Introduction to Instrumental Analysis*. Pharma Book Syndicate.
- Artie Weissberg. (2016). *Analytical Biochemistry*. Syrawood Publising House.

Journals

- Biochemistry & Analytical Biochemistry
- International Journal of Analytical Biochemistry Research
- Analytical and Bioanalytical Chemistry

E - Resources

- https://nptel.ac.in/courses/102/103/102103044/
- https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=2
- http://www.nature.com/subjects/analytical-biochemistry
- https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=944
- https://epgp.inflibnet.ac.in/

ENDOCRINOLOGY

PBCM210

Semester : II **Credit : 4**
Category : Core VIII/ DSC VIII **Hour/Week : 4**
Class &Major : I M.Sc. Biochemistry **Total Hour : 52**

Objectives:

To enable the students

- Acquire In-Depth Knowledge about Types, Classification, Biosynthesis, Interaction, Function and Regulation of Hormones.
- Impart Knowledge on Cell Surface Receptors in Signal Transduction Pathways.
- Expose Students to the Various Molecules Involved in Signal Transduction with Special Emphasis on Receptors.

Learning Outcomes:

On Completion of the Course, the Students will be able to,

- Understand the Role of Hypothalamo - Pituitary Axis is the Coordination of Nervous & Endocrine System.
- Learn the Functions of Pituitary, Parathyroid and Thyroid Secretion & Associated Disorders.
- Explain the Actions of Adrenal and Gonadal, GI Tract and Pancreatic Hormones & Secretions.
- Discuss the MAP Kinase and Nuclear Receptor Mediated Pathway and Analyse Signaling Cross Talk.

UNIT - I CLASSIFICATION AND MECHANISM **10 Hour**

Introduction to Hormones, Definition and Classification. Mechanism of Action of Hormones and its Regulation. Hypothalamic and Pituitary Hormones - Anterior Pituitary Hormones: Biological Actions Regulation and Disorders of Growth Hormones. Posterior Pituitary Hormones - Biological Actions and Regulation of Vasopressin. Diabetes Insipidus and Hypo and Hyper Pituitarism.

UNIT - II AMINO ACID DERIVED HORMONES **10 Hour**

Thyroid Hormones - Transport, Metabolic Fate and Biological Actions. Hypo and Hyper Thyroidism. Hormonal Regulation of Calcium and Phosphate Metabolism. Secretion and Biological Actions of PTH, Calcitonin. Hypo and Hyper Calcemia. Adrenal Cortical Hormones. Regulation, Transport and Biological Effects. Adrenal Medullary Hormones - Secretion, Regulation and Biological Effects of Catecholamines.

UNIT - III STEROID HORMONES **10 Hour**

Structure, Biosynthesis, Transport of Steroid Hormones in Blood and Metabolic Inactivation of Steroid Hormones, Control of Synthesis and Release of Steroid Hormones, Hormones that Directly Stimulate Synthesis and Release of Steroid Hormone with Reference to the Second Messengers and the Signal Pathway (Cortisol, Aldosterone, Testosterone, 17B - Estradiol, Progesterone and Calcitriol).

UNIT-IV HORMONE RECEPTORS AND REGULATION **10 Hour**

Signal Transduction - Hormone - Receptor Interactions, Biochemistry of Receptor Activation. Signal Transduction through Cytoplasmic and Nuclear Receptors. Endocrine, Paracrine and Autocrine Signaling. Sensory Transduction: Nerve Cells, Synapses, Ion Channels,

Neurotransmitters, Neurotransmitter Receptors and Impulse Transmission. Receptors and Signaling Pathways - Cell Surface Receptors: G-Protein Coupled Receptors, Receptor Kinases.

UNIT-V SECOND MESSENGERS **12 Hour**

Second Messengers - Cyclic Nucleotides, Role of cGMP in Visual Transduction, cAMP and CREB. Involvement of Protein - Protein Interaction in Signaling Pathways. Metabolic Pathways for the Formation of Inositol Triphosphate from Phosphatidyl Inositol Diphosphate, Formation of DAG, Ca2+ Channel Activation, Phosphoregulation of Inositol, Activation and Translocation of Protein Kinase C in Cell Membrane. The Ras-Raf MAP Kinase Cascade. Crosstalk in Signaling Pathways.

Text Books

- Norman Levin. (2019). *Manual of Endocrinology and Metabolism*. Wolters Kluwer Publishers. (5th Ed.).
- Williams S.Melmed. et al. (2015). *Text Book of Endocrinology*. Aunders Publication. (13th Ed.).

Reference Books

- Susan.Porterfield, (2007). *Endocrine Physiology*. Mosby Publishers. (3rd Ed).
- Bernhard K, Winfried B. (2016). *Hormones and the Endocrine System: A Text Book of Endocrinology*. Springer Nature Publishers.
- Lary Jameson J. (2017). *Harrisons Endocrinology.* McGraw Hill Publishers. (20th Ed.).

Journals

- Indian Journal of Endocrinology and Metabolism
- Journal of Cell Signaling
- Journal of signal transduction
- International Journal of Endocrinology and Metabolism

E - Resources

- https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=2
- http://www.springer.com/medicine/internal/journal/12020
- https://www.kobo.com/us/en/ebook/molecular-endocrinology-1
- https://www.ebooks.com/en-ao/297039/molecular-endocrinology/franklyn-f-bolander/
- https://shodhganga.inflibnet.ac.in
- https://epgp.inflibnet.ac.in/

ANALYTICAL BIOCHEMISTRY PRACTICAL
PBCR203

Semester : II **Credit : 4**
Category : Core Practical II **Hour/Week : 6**
Class &Major : I M.Sc. Biochemistry **Total Hour :78**

Objectives:
To enable the students

- Train in Various Chromatographic and Electrophoresis Techniques for Biochemical Analysis.
- Train in Using Different Instruments and Preparation of Solutions.
- Attain Technical Competence in the Specific Discipline.

Learning Outcomes:
On Completion of the course, the students will be able to

- Gain the Basic Knowledge on the Theory, Operation and Function of Analytical Instruments
- Experienced in Handling of Various Instrumentations those are used in the Analytical Laboratories.
- Separate Biomolecules by Appropriate Chromatographic and Electrophoretic Methods.

Experiments

1. Preparation of Buffers and Measurements of pH.
2. Titrable Acidity of Aminoacids.
3. Paper Chromatography of Sugars and Aminoacids.
4. Thin Layer Chromatography of Aminoacids and Lipids.
5. Separation of Plant Pigments by Column Chromatography.
6. Paper Electrophoresis.
7. SDS PAGE/Agarose Gel Electrophoresis.
8. Preparation of Cell Free Homogenate, Isolation of Mitochondria & Nuclei from Liver and Chloroplast from Leaves.
9. Separation of Biological Compounds Using FTIR.

Text Books

- David, T.Plummer. (2008). *An introduction to Practical Biochemistry*. Tata Mac Graw hill Publication. (3rd Ed.).
- Keith Wilson, John Walker. (2010). *Principles and Techniques of Practical Biochemistry and Molecular Biology.* Cambridge University Press. (7th Ed.).

Reference Books

- Jayaraman, J. (2011). *Laboratory Manual in Biochemistry*. New Age International Limited Publication. (2nd Ed).
- Sadasivam, S. Manickam, A. (2013). *Biochemical Methods*. (3rd Ed.). New Age International Publication.
- Wilson, K. Goulding Hodder, K.H. Stoughton. (2012). *Principles and Techniques of Practical Biochemistry*. (3rd Ed.).

E - Resources

- http://elte.prompt.hu/sites/default/files/tananyagok/IntroductionToPracticalBiochemistry/book.pdf
- https://www.pinterest.com/pin/746049494494648558/
- https://www.academia.edu/28271882/An_Easy_Guide_for_Practical_Biochemistry
- https://shodhganga.inflibnet.ac.in
- https://epgp.inflibnet.ac.in/

MUSHROOM CULTIVATION (SERVICE LEARNING)

PBCX201

Semester : II **Credit: 1**
Category : Core IX/DSC IX **Total Hour: 40**
Class & Major : I M.Sc. Biochemistry
Target Group : Villagers in the age group of 20-50 years

Objectives:

To enable the students

- Create Awareness on the Nutritive Value of Mushroom.
- Enable Mushroom Cultivation in a Small Scale Range.

Learning Outcomes:

On Completion of the course, the students will be able to

- Understand the Importance of Embarking on Self-Employment and has developed the Confidence and Personal Skills for the same.
- Identify Business Opportunities in Chosen Sector / Sub-Sector and Plan and Market and Sell Products / Services
- Start a Small Business Enterprise by Liaising with Different Stake Holders.

UNIT – I INTRODUCTION **8 Hour**

Definition, Edible & Poisonous Mushroom, Nutritive and Medicinal Value of Mushroom. Composting - Importance in Waste Recycling.

UNIT - II GROWTH CHARACTERISTICS OF MUSHROOM **8 Hour**

Growth & Substrate for Volvariella Species, Pleurotus Species, Agaricus Species, Calcybe Species & Lentinus Species of Mushroom.

UNIT – III CULTIVATION OF MUSHROOM **8 Hour**

Conditions for Tropical & Temperate Countries, Isolation, Spawn Production, Growth Media, Spawn Running and Harvesting of Mushroom.

UNIT - IV DISEASE & POST HARVEST TECHNOLOGY **8 Hour**

Insect Pest, Nematodes, Mites, Viruses, Fungal Competitors and other Important Diseases. Post Harvest Technology, Freezing, Dry Freezing, Drying, Canning Etc. Entrepreneurship

UNIT - V FEED BACK & RESULT FROM SOCIETY **8 Hour**

Evaluation of Results, Mushroom Yield, Income through Mushroom Cultivation, Feedback - Oral and Written from Villagers. Activity: Cultivation of Mushroom for Commercial Purposes.

Text Books

- Nita Bahl. (2009). *Hand Book of Mushroom.* (4th Ed.). Vijay Primlani for Oxford Publication Co. Pvt Ltd, New Delhi,
- Nair M.C & Gokulapalan. C and Lulu Das. (2008). *Topics on Mushroom Cultivation.* (3rd Ed.). Scientific Publishers, Jodhapur, India.

Reference Books

- Chang.T.S. & Hayes. W.A. (2007). *The Biology and Cultivation of Edible Mushrooms.* (2nd Ed.) Academic Press, New York.
- Cotter, Tradd. (2014). *Organic Mushroom Farming and Mycoremediation: Simple To Advanced and Experimental Techniques for Indoor and Outdoor Cultivation*. Chelsea Green Publishing.

E - Resources

- https://onlinecourses.swayam2.ac.in/nos20_ge07/preview
- https://nios.ac.in/departmentsunits/vocational-education/stand-alone-courses/oyster-mushroom-production-technology.aspx
- https://www.classcentral.com/course/swayam-vocational-mushroom-production-23137

PHARMACEUTICAL BIOCHEMISTRY

PBCE101/201

Semester : II **Credit :4**
Category : Non-Major Elective I **Hour/Week : 5**
Class & Major : I PG **Total Hour : 65**

Objectives:

To enable the students

- Understand the Drug Metabolic Pathways, Adverse Effect and Therapeutic Value of Drugs.
- Evaluate their Clinical Importance and Effects by Bioassays.

Learning Outcomes:

On Completion of the course, the students will be able to

- Knowledge about the Sources of Impurities and Methods to Determine the Impurities in Inorganic Drugs and Pharmaceuticals.
- Understand the Medicinal and Pharmaceutical Importance of Inorganic Compounds.
- To have been Introduced to a Variety of Inorganic Drug Classes.

UNIT - I BIOPHARMACEUTICALS **11 Hour**

Definition, Various Routes of Administration with Advantages/Disadvantages, Bioavailability Concepts in Drug Absorption and Distribution, Theories of Drug Dissolution, Drug Partition Hypothesis, Permeability and Distribution of Drugs, Perfusion Rate and Volume of Distribution, Protein Binding of Drugs, Kinetics of Drug Binding, Various Factors that affect Drug Absorption and Distribution, Drug Interactions in the Level of Drug Absorption and Distribution. Biopharmaceuticals and Pharmacokinetics and their Importance in Formulation. Biopharmaceuticals - Production and Clinical Usage of Biopharmaceuticals.

UNIT - II BIOMEDICAL IMPORTANCE OF DRUGS **12 Hour**

Biochemical Role of Hormones, Vitamins, Enzymes, Nucleic Acids, Bioenergetics. General Principles of Immunology. Immunological Techniques. Adverse Drug Interaction. Preparation and Storage and Uses of Official Radiopharmaceuticals.

UNIT - III PHARMACODYNAMICS OF DRUGS **15 Hour**

Sedatives, Analgesics, NSAIDS, Neuroleptics, Antidepressants, Anxiolytics, Anticonvulsants, Antihistaminics, Local Anaesthetics, Cardio Vascular Drugs - Antianginal Agents, Vasodilators, Adrenergic & Cholinergic Drugs, Cardiotonic Agents, Diuretics, Antihypersenstive Drugs, Hypoglycemic Agents, Antilipedmic Agents, Coagulants, Anticoagulatns, Antiplatelet Agents. Chemotherapeutic Agents - Antibiotics, Antibacterials, Sulphadrugs. Antiprolizoal Drugs, Antiviral, Antitubercular, Antimalarial, Anticancer, Antiamoebic Drugs. Diagnostic Agents.

UNIT - IV TOXICOLOGY **15 Hour**

Toxicology, Drug Interactions and Pharmacology of Drugs Acting on Central Nervous System, Cardiovascular System, Autonomic Nervous System, Gastro Intestinal System and Respiratory System. Hormones, Chemotherapeutic Agents Including Anticancer Drugs. Bioassays.

UNIT - V CHEMOTHERAPY OF MICROBIAL DISEASES **12 Hour**

Chemotherapy of Microbial Diseases: Urinary Antiseptics, Sulphonamides, Penicillin, Streptomycin, Tetracyclines and other Antibiotics. Anti - Tubercular Agents, Antifungal Agents, Antiviral Drugs, Anti - Leprotic Drugs. Chemotherapy of Protozoal Diseases, Anthelmintic Drugs. Chemotherapy of Cancer.

Text Books

- Alfred Burger. (2009). A *Guide to Chemical Basis of Drugs Design*. John Wiley & Sons.
- Goodman and Gilman's. (2006). *the Pharmacological Basis of Therapeutics.* (8th Ed.), Pergamon Press.

Reference Books

- John Smith and Haywel Williams. (2008). *Introduction to the Principles of Drug Design.* Wright PSG.
- Manfred E Wolff. (2012) *Burgers Medicinal Chemistry – The Basis of Medicinal Chemistry.* Part – I. John Wiley & Sons.

E - Resources

- https://www.schandpublishing.com/books/highereducation/medical/pharmaceutical-biochemistry/9788121942485/#.YM-UE2gzbIU
- https://onlinecourses.nptel.ac.in/noc20_cy16/preview
- https://onlinecourses.swayam2.ac.in/cec20_bt19/preview

REPRODUCTIVE BIOLOGY AND DISORDERS

PBCE102/202

Semester : II **Credit : 4**
Category : NME **Hour/Week : 5**
Class &Major : I PG **Total Hour : 65**

Objectives:
To enable the students

- Study on Biological Aspects of Human Reproduction
- Discuss on Birth Control, Infertility and Sexually Transmitted Diseases

Learning Outcomes:
On Completion of the course, the students will be able to

- Describe the Structure of the Organs of the Reproductive System in Males and Females and Indicate how this Relates to Function.
- Explain the Processes of Spermatogenesis, Oogenesis and Folliculogenesis and be Able to Compare and Contrast these Processes.
- Describe the Hormonal, Tissue and Behavioural Changes that Occur across the Menstrual Cycle and explain how these are regulated.

UNIT - I INTRODUCTION OF REPRODUCTIVE SYSTEM **10 Hour**

Reproduction - Definition, Structure and Function of Male and Female Reproductive System. Endocrine Control of Reproductive Function.

UNIT – II REPRODUCTIVE CYCLE **15 Hour**

Menstrual Cycle - Ovarian Cycle (Follicular Phase, Ovulation, Luteal Phase), Uterine Cycle (Menstruation, Proliferative Phase and Secretory Phase), Cycle Abnormalities and Disorders - Dysmenorrhea, Hypomenorrhea, Menorrhagia, Polymenorrhea, Oligomenorrhea, Metrorrhegia, Infertility, Abortion, Polycystic Ovarian Syndrome.

UNIT – III GAMETES AND FERTILIZATION **10 Hour**

Ultra Structure of Sperm and Egg, Gametogenesis, Oogenesis. Fertilization - External, Internal, Artificial and In - Vitro. Embryo Transfer, Test for Sperm Viability and Function.

UNIT – IV FOETAL DEVELOPMENT **15 Hour**

Pregnancy and Fetal Development - Prenatal Development of Foetus, Stages of Fetal Growth and Pregnancy Test, Contraception, Risk Factors of Miscarriage, Pregnancy Loss and Still Birth.

UNIT – V SEXUALLY TRANSMITTED DISEASES **15 Hour**

HIV/AIDS - Definition, Causes and Symptoms, Diagnosis, Mode of Transmission, Prevention and Treatment. Syphilis - Types, Causes and Symptoms, Diagnosis, Congenital Syphilis, Prevention and Treatment.

Text books

- Sastry K.V. (2017). *Endocrinology and Reproductive Biology*. Rastogi Publications.
- Sachdeva R.K. (2012). *A Guide to Obstetrics and Gynaecology*. Jaypee Brother Publications.

Reference books

- Richard. E. Jones., Kristin H. Lopez. (2016). *Human Reproductive Biology.* (3rd Ed.).
- Taylor, J., Green N.P.O., Stout G.W. (2010). *Biological Sciences.* (3rd Ed.).

e - Resources

- https://bookboon.com/en/introduction-to-clinical-biochemistry-ebook.
- https://www.kobo.com/us/en/ebook/clinical-biochemistry-e-book-1.
- https://www.elsevier.com/books/human-reproductive-biology/jones/978-0-12-382184-3

MODERN LIFESTYLE ASSOCIATED DISEASES

PBCE103/203

Semester : II **Credit : 4**
Category : NME/SEC **Hour/Week : 5**
Class &Major : I PG **Total Hour : 65**

Objectives:

To enable the students

- Obtain Knowledge and Understanding of Health, Nutrition and other Lifestyle and Associated Diseases.
- Choose Healthy Life Style to Cope with Modern Life.

UNIT I - DIABETES **12 Hour**

Definition, Types, Causes, Prevalence, Diagnosis, Complications, Treatment and Preventive Measures. The Diabetic Lifestyle, Gestational Diabetes, Diabetes and Diet Coping Skills for Diabetics.

UNIT II - HYPERTENSION **13 Hour**

Definition, Signs and Symptoms, Causes, Types (Primary and Secondary). Blood Pressure (Effectively and Benefit of BP Reduction). Retinopathy, Diagnosis, Treatment and Prevention.

UNIT - III OBESITY AND CORONARY HEART DISEASE **15 Hour**

Definition, Causes of Obesity, BMI, Health Consequences, Strategies to Reduce Obesity, Strategies to Promote Health, Childhood Obesity and Diet, Prevention.

Coronary Heart Disease: Types, Symptoms, Diagnosis, Prevention and Management and Treatment. Medication Requirement, CHD and Diet, Stroke Prevention Measures, Pharmacological Management of CHD.

UNIT IV - OSTEOPOROSIS **13 Hour**

Definition, Types, Symptoms, Treatment, Causes and Prevention. Diagnosis, Diet and Osteoporosis and Exercise. Drugs in Osteoporosis, Bone Disease, Dietary Requirement for Osteoporosis.

UNIT V - ANAEMIA **12 Hour**

Definition, Causes, Types, Symptoms and Treatment of Anaemia. Iron Deficiency, Diet and Anaemia. Anaemia and Pregnancy - Prevalence and Consequences of Anaemia in Pregnancy. Anaemia Treatment.

Text Books

- Kumar, M. Kumar. R. (2014). *Guide to Prevention of Lifestyle Diseases*. Deep and Deep Publications.
- Tudith Stern. Alexendra Kuzaks. (2011). *Obesity: A Reference Handbook.* ABC-CLIO.

Reference Books

- Mindori Hiramatsu. Toshikazu Toshikawa. Lister Packer. (2012). *Molecular Interventions in Lifestyle Related Diseases*. CRC Press.
- David, L.Katz. (2014). *Diseases Proof.* Plume.

E - Resources

- https://www.elsevier.com/books/clinical-biochemistry/murphy/978-0-7020-7298-7
- https://bookboon.com/en/introduction-to-clinical-biochemistry-ebook
- https://www.kobo.com/us/en/ebook/clinical-biochemistry-e-book-1

III & IV EVALUATION COMPONENTS OF CIA

Semester	Category	Course Code	Course Title	Component III	Component IV
I	Core I	PBCM101	Bimolecular Chemistry	Assignment	Seminar
	Core II	PBCM102	Cell Biology	Poster Preparation	Seminar
	Core III	PBCM203/105	Microbiology	Case Study	Culture preparation
	Core IV	PBCM204/106	Molecular Biology	Poster Preparation	Seminar
II	Core V	PBCM201	Metabolism and Regulation	Poster Preparation	Seminar
	Core VI	PBCM202	Human physiology	Model preparation	Seminar
	Core VII	PBCM103/205	Analytical biochemistry	Model preparation	Seminar
	Core VIII	PBCM104/206	Endocrinology	Model preparation	Seminar
	NME	PBCE201	Pharmaceutical Biochemistry	Assignment	Seminar
		PBCE202	Reproductive Biology and Disorder	Seminar	Seminar
		PBCE203	Modern life Style Associated Disease	Case Study	Seminar

DEPARTMENT OF CHEMISTRY

PREAMBLE

UG : Programme Profile and the Syllabi of Courses Offered in Semester I and II Along with I and II Evaluation Components (with Effect from 2021 – 2024 Batch onwards).

PG : Syllabi of Programme offered in Semester I and II along with I and II Evaluation Components (with Effect from 2021 – 2023 Batch onwards).

PROGRAMME PROFILE B.Sc., (Chemistry)

Programme Specific Outcomes (PSO)

Upon completion of the programme, the students will be able to

- Development of the Skills in handling various Chemicals, Apparatus and Instruments.
- Application of the Principles of Thermodynamics and Chemical Kinetics in Chemical Reactions.
- Acquiring the Knowledge on Heterocyclic Compounds and Natural Products.
- Ability to apply the basic Principles of various Spectroscopic, Electro and Thermo Analytical Methods to Characterize the Compounds.
- Industrial insights on Polymers, Textile Dyes, Fibre and Medicinal Chemistry.

Semester	Part	Category	Course code	Course Title	Pervious course code	Contact Hour/ Week	Min/Max
I	I	Languages/ AECC-IITamil/ Hindi/French	UTAL107/ UTAL108/ UHIL101/ UFRL101	Basic Tamil-I/ Advanced Tamil-I/ Hindi-I/ French-I	UTAL103/ UTAL104	5	3/4
	II	English/AECC-I	UENL109/ UENL110	English for Communication (Stream – I)/ English for Communication (Stream – II)		5	3/4
	III	Core I/ DSC-I	UCHM108	Inorganic Chemistry-I	-	5	5
		Core II/ DSC-II	UCHM109	Analytical Chemistry	-	4	4
		Core Practical I/ DSC Practical-I	UCHR101	Volumetric Practical	-	3	2
		Allied I/GE	UPHA102	Allied Physics - I	-	3	2
		Allied Practical I/GE Practical-I	UPHR103	Allied Physics Practical-I	-	3	2
		Core III/ DSC-III	UPEM101	Professional English I		6	4
	IV	Value Education				2	1
				Total		**36**	**26/28**
II	I	Languages/ AECC-II Tamil/ Hindi/French	UTAL207/ UTAL208/ UHIL201/ UFRL201	Basic Tamil-II/ Advanced Tamil-II/ Hindi-II/ French-II	UTAL203/ UTAL204	5	3/4
	II	English/AECC-I	UENL209/ UENL210	English for Communication (Stream – I)/ English for Communication (Stream – II)		5	3/4
	III	Core IV/ DSC-IV	UCHM203	Organic Chemistry-I		5	5
		Core V/ DSC-V	UCHM204	Nuclear & Radiation Chemistry	-	3	3
		Core Practical II/DSC Practical II	UCHR206	Organic Practical	-	3	2
		Allied II/GE	UPHA201	Allied Physics II	-	3	2
		Allied Practical II /GE Practical II	UPHR202	Allied Physics Practical-II	-	3	2
		Core VI/ DSC-VI	UPEM201	Professional English II		6	4

II	IV	NME			-	3	2
	V	Extension Programme/ Physical Education/NCC			-	-	1/2
Total						**36**	**27/30**
III	I	Languages/ AECC-II Tamil/Hindi/French	UTAL307/ UTAL308/ UHIL301/ UFRL301	Basic Tamil-III/ Advanced Tamil-III/ Hindi-III/ French-III	UTAL303/ UTAL304	5	3/4
	II	English/AECC-I	UENL309/ UENL310	English for Communication (Stream – I)/ English for Communication (Stream – II)	UENL306	5	3/4
	III	Core VII/ DSC-VII	UCHM307	Physical Chemistry - I	-	4	4
		Core VIII/ DSC-VIII	UCHM308	Electrochemistry	-	3	2
		Core Practical III /DSC Practical III	UCHR404/ UCHR405	Semi Micro Qualitative Inorganic Analysis		3	-
		Allied/GE	UMAA304	Algebra, Differential Calculus and Trigonometry	-	5	4
	IV	Online Course		Online Course (NPTEL/ST)		3	1/2
		Value Education				2	1
Total						**30**	**18/21**
IV	I	Languages/ AECC-II Tamil/Hindi/French	UTAL407/ UTAL408/ UHIL401/ UFRL401	Basic Tamil-IV/Advanced Tamil-IV/ Hindi-IV/ French-IV	UTAL403/ UTAL404	5	3/4
	II	English/AECC-I	UENL409/ UENL410	English for Communication (Stream – I)/ English for Communication (Stream – II)	-/ UENL406	5	3/4
	III	Core IX/ DSC-IX	UCHM407	Molecular Spectroscopy & Photochemistry	-	4	4
		Core X/ DSC-X	UCHM408	Research Methodology	-	3	2
		Core Practical III /DSC Practical III	UCHR404/ UCHR405	Semi micro Qualitative Inorganic Analysis	-	3	4
		Allied/GE	UMAA406	Integral Calculus, Laplace Transform & Ordinary Differential Equation	-	5	4
	IV	NME				3	2
		Soft skill	USKS401			2	1
	V	Extension Programme/ Physical Education/NCC				-	-/2
	Total					**30**	**23/27**
V	III	Core XI/ DSC-XI	UCHM510	Inorganic Chemistry – II	-	5	5
		Core XII/ DSC-XII	UCHM511	Organic Chemistry – II	-	5	5
		Core XIII/ DSC-XIII	UCHM512	Physical Chemistry –II	-	5	5
		Major Elective /DSE-I	UCHO501 UCHO502 UCHO503	Organometallics and Bioinorganic chemistry Heterocyclic Chemistry Organic Spectroscopy	-	5	4
		Core Practical IV /DSC Practical IV	UCHR501	Gravimetric Analysis	-	3	2
		Core XIV/ DSC-XIV	UCHP501	Project	-	5	5
	IV	Value education				2	1
Total						**30**	**27**

VI	III	Core XV/ DSC-XV	UCHM614	Inorganic Chemistry III	-	5	5
		Core XVI/ DSC-XVI	UCHM615	Organic Chemistry III	-	5	5
		Core XVII/ DSC-XVII	UCHM616	Physical Chemistry III	-	5	5
		Core XVIII/ DSC-XVIII	UCHM617	Advanced Material Chemistry		2	2
		Major Elective/ DSE-II	UCHO602 UCHO603 UCHO604	Polymer Chemistry Medicinal Chemistry Forensic Chemistry	-	5	4
		Core Practical V /DSC Practical V	UCHR605	Physical Chemistry Practical	-	3	2
		Core Practical VI /DSC Practical VI	UCHR606	Organic Analysis and Preparation	-	3	2
		Viva –Voce	UCHM605	Comprehensive Viva-Voce	-	-	1
	IV	Soft Skill	USKS601		-	2	1
	V	Extension Programme/ Physical Education			-	-	-/2
Total						**30**	**27/29**
Grand Total						**192**	**148/162**

LIST OF COURSES OFFERED TO OTHER DEPARTMENTS
ALLIED AND ALLIED OPTIONAL COURSES

Semester	Part	Category	Course code	Course title	Pervious course code	Contact Hour per week	Credits
							Min/Max
I	III	Allied- I/GE	UCHA103	Chemistry for Biochemist		3	2
IV	III	Allied- I/GE	UCHA402	Chemistry for Physics		3	2
I	III	Allied Practical-I/ GE Practical-I	UCHR104	Organic Analysis	-	3	2
IV	III	Allied Practical-II/ GE Practical-II	UCHR404	Volumetric Analysis		3	2
V	III	Allied Optional	UCHA502 UCHA504 UCHA505 UCHA506	Industrial Chemistry Dairy Chemistry Agricultural Chemistry Environmental Chemistry	-	5	4

NON- MAJOR ELECTIVE COURSES

Semester	Part	Category	Course code	Course title	Pervious course code	Contact Hour per week	Credits
							Min/Max
II	IV	Non major Elective	UCHE204 UCHE205 UCHE206	Food Chemistry Health and Hygiene Cosmetics and Detergents	-	3 3 3	2 2 2
IV	IV	Non major Elective	UCHE401 UCHE402 UCHE403	Agricultural Chemistry Environmental Chemistry Industrial Chemistry		3 3 3	2 2 2

EXTRA CREDIT EARNING PROVISION

Semester	Category	Course Code	Course Title	Pervious Course Code	Hour per Week	Credits
						Min/Max
II	Core	UCHI201	Internship	-	-	1
IV	Core	UCHI401	Internship	-	-	1
VI	Core	UCHS601/ UCHP601	Green Chemistry (Self Study Paper) / Project	-	-	1/2

EXPERIENTIAL LEARNING (MANDATORY/ONLY FOR INTERESTED STUDENTS)

Related Paper	Work experience		Proposed period (Sem.Break/May / Any Other)	Collaborating Agency	Mode of Evaluation
	Nature of the Course/Institution	Proposed Duration (No.of.Days/Weeks/Months)			
UCHM509	Organic Farming	2 days	August	MSME	To get Certificate

SKILL ORIENTATION PROGRAMME (MANDATORY/ONLY FOR INTERESTED STUDENTS)

Semester	Category	Course code	Course title	Collaborating Agency	Hour/Days/Month	Mode of Evaluation
V	Core	UCHT501	Industrial Lab safety	TCIL	4 days	To get Certificate

INORGANIC CHEMISTRY-I

UCHM108

Semester : I **Credit :05**
Category : Core I/DSC-I **Hour/Week : 05**
Class & Major : I B.Sc., Chemistry **Total Hour : 65**

Objectives:

To enable the students

- Learn Scientific Theory of Atoms and its Concept.
- Understand the Elements in the Periodic Table.
- Predict the Structure of Atoms and their Chemical Bonding.

Learning Outcomes:

On completion of the course, the students will be able to

- Understand the Structure of Atoms and Rules Involved in it.
- Gain Knowledge about the Basic Concepts Block Elements and their Properties.
- Acquire about the various types of Chemical Bonding and their Characteristics.

UNIT-I ATOMIC STRUCTURE **15 Hour**

Bohr's Theory-Limitations-Atomic Spectrum of Hydrogen Atom-Wave Mechanics-de Broglie Equation-Heisenberg's Uncertainty Principle and its Significance-Schrödinger's Wave Equation-Significance of ψ and ψ^2-Quantum Numbers and their Significance-Normalized and Orthogonal Wave Functions-Sign of Wave Functions-Radial and Angular Wave Functions for Hydrogen Atom-Radial and Angular Distribution Curves-Shapes of *s*, *p*,

d and *f* Orbitals-Contour Boundary and Probability Diagrams-Pauli's Exclusion Principle-Hund's Rule of Maximum Multiplicity-Aufbau's Principle and its Limitations-Variation of Orbital Energy with Atomic Number.

UNIT-II PERIODICITY OF ELEMENTS **15 Hour**

s, *p*, *d*, *f* Block Elements-Long Form of Periodic Table- *s* and *p*-Block and their Properties -Effective Nuclear Charge-Shielding or Screening Effect-Slater Rules-Variation of Effective Nuclear Charge in Periodic Table-Atomic radii (Vander Waals)-Ionic and Crystal radii-Covalent radii (Octahedral and Tetrahedral)- Ionization Enthalpy-Successive Ionization Enthalpies-Factors affecting ionization energy-Applications of Ionization Enthalpy-Electron Gain Enthalpy-Trends of Electron Gain Enthalpy-Electro Negativity-Pauling-Mullikan-Allred Rochow Scales-Electro Negativity and Bond Order-Partial Charge-Hybridization-Group Electro Negativity-Sanderson electron density ratio.

UNIT-III CHEMICAL BONDING I **10 Hour**

Ionic Bond-General Characteristics-Types of Ions-Size Effects-Radius Ratio Rule and its Limitations-Packing of Ions in Crystals-Born-Landé Equation with Derivation-Expression for Lattice Energy-Madelung Constant-Born-Haber Cycle and its Application-Solvation Energy. Covalent bond-Lewis structure-Valence Shell Electron Pair Repulsion Theory (VSEPR)- Shapes of Simple Molecules-Ions Containing Lone and Bond Pairs of Electrons-Multiple Bonding-Sigma and Pi-Bond Approach.

UNIT-IV CHEMICAL BONDING II **13 Hour**

Valence Bond Theory (Heitler-London Approach)- Hybridization Containing s, p, d Atomic Orbital-Shapes of Hybrid Orbital-Bents Rule-Resonance and Resonance Energy-Molecular Orbital Theory-Molecular Orbital Diagrams- Simple Homonuclear and Heteronuclear Diatomic Molecules-MO Diagrams of Simple Tri and Tetra-Atomic Molecules (N_2, O_2, C_2, B_2, F_2, CO, NO)-Ions; HCl, BeF_2, CO_2, HCHO (Idea of s-p Mixing and Orbital Interaction to be Given)-Covalent Character in Ionic Compounds- Polarizing Power-Polarizability-Fajan Rules-Polarization-Ionic Character in Covalent Compounds-Bond Moment and Dipole Moment-Ionic Character from Dipole Moment- Electro Negativities.

UNIT-V METALLIC AND WEAK BONDS **12 Hour**

Metallic Bond-Qualitative Idea of Free Electron Model-Semiconductors-Insulators-Weak Chemical Forces-Vander Waals-Ion Dipole-Dipole Dipole- Dipole Induced Dipole Interactions-Lenard Jones 6 to 12 Formula-Hydrogen Bond-Effects of Hydrogen Bonding on Melting and Boiling Points-Solubility-Dissolution.

Reference Books

- Puri, B.R. Sharma, L.R. and Khalia, K. C. (2020). *Principles of Inorganic Chemistry*. Vishal Publishing Co. (33rd Ed.). India.
- Tuli, G.D. Satyaprakash. Basu, S.K. and Madan, R.D. (2006). *Advanced Inorganic Chemistry* (Vol. I & II). S. Chand. New Delhi.

Text Books

- Madan, R.D. (2019). *Modern Inorganic Chemistry*. S. Chand and Company Ltd. (3rd Ed.). New Delhi.
- Lee, J.D. (2014). *Concise Inorganic Chemistry.* (5thEd.). ELBS. London.

ANALYTICAL CHEMISTRY
UCHM109

Semester : I **Credit: 04**
Category : Core II/DSC-II **Hour/Week: 04**
Class & Major : I B.Sc., Chemistry **Total Hour : 52**

Objectives:
To enable the Students

- Understand the Basic Concepts of Analytical Process.
- Different Method of Instrumentation Available for the Studies.
- Various Techniques that are Involved in the Analytical Chemistry.

Learning Outcomes:
On completion of this course, the Students will be able to

- Familiar with Sampling, Statistical Testing of Data.
- Know the Basics of Thermal, Electroanalytical Techniques.
- Learn the Concept of Separation Techniques, Mechanism and its Applications.
- Gain Knowledge in Qualitative and Quantitative Aspects of Chromatographic Methods.

UNIT-I QUALITATIVE AND QUANTITATIVE ASPECTS OF ANALYSIS 9 Hour

Tools in Analytical Chemistry and their Applications, Sampling, Evaluation of Analytical Data, Errors, Accuracy and Precision, Statistical Test of Data; F, Q and t-test, Rejection of Data and Confidence Intervals.

UNIT-II THERMAL AND ELECTROANALYTICAL METHODS 10 Hour

Thermal analysis: Theory of Thermogravimetry (TG and DTG), Instrumentation, Estimation of Ca and Mg from their Mixture. Electroanalytical Methods: Classification of Electroanalytical Methods, Basic Principle of pH Metric, Potentiometric and Conductometric Titrations. Techniques Used for the Determination of Equivalence Points. Determination of pKa Values.

UNIT-III SEPARATION TECHNIQUES 15 Hour

Solvent Extraction: Classification, Principle and Efficiency of the Technique. Mechanism of Extraction: Extraction by Solvation and Chelation. Technique of Extraction: Batch, Continuous and Counter Current Extractions. Qualitative and Quantitative Aspects of Solvent Extraction: Extraction of Metal Ions from Aqueous Solution, Extraction of Organic Species from the Aqueous and Non-Aqueous Media.

UNIT-IV PURIFICATION TECHNIQUES 8 Hour

Desiccants, Distillation - Principle and Types-Fractional, Steam Azeotropic, Re-Crystallization and Sublimation. Test of Purity - Melting and Boiling Point.

UNIT-V CHROMATOGRAPHY TECHNIQUES 10 Hour

Classification, Principle and Efficiency of the Technique. Mechanism of Separation: Adsorption, Partition & Ion Exchange. Development of Chromatograms: Frontal, Elution and Displacement Methods. Qualitative and Quantitative Aspects of Chromatographic Methods of Analysis Using LC, GLC, TLC and HPLC.

Reference Books

- Khopkar, S.M. (1998). *Basic Concepts of Analytical Chemistry*. New Age International Publisher. (2nd Ed.). India.
- Skoog, D.A. Holler, F.J. Nieman, T.A. (1997). *Principles of Instrumental Analysis*. Brooks & Cole. (5th Ed.). United States.

Text Books

- Mendham, J. A. I. (2009). *Vogel's Quantitative Chemical Analysis*. Pearson. (6th Ed.). London.
- Christian, G.D. (2004). *Analytical Chemistry*. John Wiley & Sons. (6th Ed.). New York.
- Skoog, D.A. Holler F.J. & Nieman, T.A. (1998). *Principles of Instrumental Analysis.* Saunder College Publications. United States.

VOLUMETRIC PRACTICAL

UCHR101

Semester	**: I**	**Credit**	**: 02**
Category	**: Core Practical-I/DSC Practical -I**	**Hour/Week**	**: 03**
Class & Major	**: I B.Sc., Chemistry**	**Total Hour**	**: 39**

Objectives:

To enable the students

- Gain Practical Knowledge of Using Apparatus.
- Analysis the Concentration and Mass of the Given Compound.

Learning Outcomes:

On completion of this course, the students will be able to

- Understand the Practical Knowledge of Titrimetric Analysis.
- Gain the Knowledge of Acid-Base Titrations.
- Understand the Oxidation-Reduction Reactions.

(A) Titrimetric Analysis

(i) Calibration and Use of Apparatus.
(ii) Preparation of Solutions of Different Molarity/Normality of Titrants.
(iii) Use of Primary and Secondary Standard Solutions.

(B) Acid-Base Titrations

(i) Estimation of Carbonate and Hydroxide Present Together in Mixture.
(ii) Estimation of Carbonate and Bicarbonate Present Together in a Mixture.
(iii) Estimation of Free Alkali Present in Different Soaps/Detergents.

(C) Oxidation-Reduction Titrimetry

(i) Estimation of Fe (II) and Oxalic Acid Using Standardized $KMnO_4$ Solution.
(ii) Estimation of Oxalic Acid and Sodium Oxalate in a Given Mixture.
(iii) Estimation of Fe (II) with $K_2Cr_2O_7$ Using Internal (Diphenylamine, Anthranilic acid) and External Indicator.

(D) Complexometric Titrations

(i) Estimation of Hardness of Water.
(ii) Estimation of Calcium EDTA Method.
(ii) Estimation of Zinc EDTA Method.

References Books

1. Mendham, J.A.I. (2009). *Vogel's Quantitative Chemical Analysis*. Pearson. (6th Ed.). London.
2. Svehala, G. and Sivasankar, I. B. (2012). *Vogel's Qualitative Inorganic Analysis*. Pearson. London.

ORGANIC CHEMISTRY-I

UCHM203

Semester	**: II**	**Credit**	**: 05**
Category	**: Core IV/DSC-IV**	**Hour/Week**	**: 05**
Class & Major	**: I B.Sc., Chemistry**	**Total Hour**	**: 65**

Objectives:

To Enable the Students

- Understand about the Concept of Organic Chemistry and Stereo chemistry.
- Know the Concepts of Saturated and Unsaturated Hydrocarbons
- Study the Aromaticity and its Mechanism**.**

Learning Outcomes:

On completion of this course, the students will be able to

- Know the Basics of Organic Molecules, Structure, Bonding, Reactivity and Reaction Mechanisms.
- Understand the Stereochemistry of Organic Molecules – Conformation and Configuration, Asymmetric Molecules and Nomenclature.
- Gain Knowledge in Alkanes and Cycloalkanes Compounds.
- Acquire about Elimination Reaction and its Mechanism.
- Familiar about Aromaticity of the Compounds.

UNIT-I BASICS OF ORGANIC CHEMISTRY **5 Hour**

Organic Compounds: Classification, and Nomenclature, Hybridization, Shapes of molecules, Influence of Hybridization on Bond Properties. Electronic Displacements: Inductive, Electromeric, Resonance and Mesomeric Effects, Hyperconjugation and their Applications; Dipole Moment; Organic Acids and Bases; their Relative Strength. Homolytic and Heterolytic Fission with Suitable Examples. Curly Arrow Rules, Formal Charges; Electrophiles and Nucleophiles; Nucleophlicity and basicity; Types, Shape and Relative Stabilities of Reaction Intermediates (Carbocations, Carbanions, Free radicals and Carbenes). Organic Reactions and their Mechanism: Addition, Elimination and Substitution Reactions.

UNIT-II STEREOCHEMISTRY **15 Hour**

Concept of asymmetry, Fischer Projection, Newman and Sawhorse projection formulae and their inter-conversions; Geometrical isomerism: cis–trans and, syn-anti isomerism E/Z notations with C.I.P rules. Optical Isomerism: Optical Activity, Specific Rotation, Chirality/Asymmetry, Enantiomers, Molecules with two or more chiral-centres, Diastereoisomers, meso structures, Racemic mixtures, Relative and absolute configuration: D/L and R/S designations.

UNIT-III CHEMISTRY OF SATURATED HYDROCARBONS **10 Hour**

Carbon-Carbon Sigma Bonds -Chemistry of Alkanes: Formation of Alkanes, Wurtz Reaction, Wurtz- Fittig Reactions, Free radical substitutions: Halogenation - Relative Reactivity and Selectivity. Cycloalkanes and Conformational Analysis Cycloalkanes and Stability, Baeyer Strain Theory, Conformation Analysis, Energy Diagrams of Cyclohexane: Chair, Boat and Twist Boat Forms.

UNIT-IV CHEMISTRY OF UNSATURATED HYDROCARBONS **13 Hour**

Formation of Alkenes and Alkynes by Elimination Reactions, Mechanism of E1, E2, E1cB Reactions. Saytzeff and Hofmann Eliminations. Reactions of Alkenes: Electrophilic Additions their Mechanisms (Markownikoff/ Anti-Markownikoff addition), Mechanism of Oxymercuration Demercuration, Hydroboration- Oxidation, Ozonolysis, Reduction (Catalytic and Chemical), Syn and Anti-Hydroxylation (Oxidation). 1, 2- and 1, 4- Addition Reactions

in Conjugated Dienes and, Diels- Alder reaction; Allylic and Benzylic Bromination and Mechanism, e.g. Propene, 1-Butene, Toluene, Ethyl Benzene. Reactions of Alkynes: Acidity, Electrophilic and Nucleophilic Additions.

UNIT-V AROMATIC HYDROCARBONS **12 Hour**

Aromaticity: Huckel's Rule, Aromatic Character of Arenes, Cyclic Carbocations/Carbanions and Heterocyclic Compounds with Suitable Examples. Electrophilic Aromatic Substitution: Halogenation, Nitration, Sulphonation and Friedel-Craft's Alkylation/Acylation with their Mechanism. Directing Effects of Substituent Groups.

Reference Books

- Morrison, R.N. & Boyd, R.N. (2002). *Organic Chemistry*. (6th Ed.). Prentice- Hall of India. India.
- Pine, S.H. (2007). *Organic Chemistry*. (5th Ed.). Mc Graw Hill. United States.
- Carey, F.A. (2008). *Organic Chemistry*. (7th Ed.). Tata McGraw Hill. United States.

Text Books

- Clayden, J. Greeves, N. Warren, S. (2012). *Organic Chemistry*. (2nd Ed.) Oxford University Press. United Kingdom.
- Carey, F. A. Sundberg, R. J. (2000). *Advanced Organic Chemistry. Part A: Structure and Mechanism.* Kluwer Academic Publisher. Amsterdam.

NUCLEAR & RADIATION CHEMISTRY

UCHM204

Semester	**: II**	**Credit**	**: 03**
Category	**: Core V/DSC-V**	**Hour/Week**	**: 03**
Class & Major	**: I B.Sc., Chemistry**	**Total Hour**	**: 39**

Objectives:

To enable the students

- Familiar about Nucleus and its Reactions.
- Understand the Radio Chemistry.
- Aware about the Pollution of Nuclear Reactions.

Learning Outcomes:

On completion of this course, the students will be able to

1. Understand the Nuclear Reactions Basic Concepts and its Classification.
2. Gain Knowledge about the Reactions Involved in Nucleus.
3. Know about the Radiations and its Process.
4. Acquires about the Nuclear Pollution.

UNIT-I NUCLEUS AND ITS CLASSIFICATION **8 Hour**

Nuclear Forces-Nuclear Stability-Binding Energy-Nuclear Models-Radioactive Decay-Radioactive Elements-General Characteristics of Radioactive Decay-Decay Kinetics-Decay Constant-Half Life-Mean Life Period-Units of Radioactivity-Transient and Secular Equilibria- Carbon Dating and its Usefulness.

UNIT-II NUCLEUS REACTIONS **8 Hour**

Bethe Notation-Types of Nuclear Reactions (n, p, α, d and γ)-Conservation of Quantities (Mass-Energy and Linear Momentum) in Nuclear Reactions-Reaction Cross-Section-Compound Nucleus Theory and Nuclear Reactions-Nuclear Fission-Process-Fragments-Mass Distribution and Fission Energy.

UNIT-III MEASUREMENT OF RADIOACTIVITY **9 Hour**

Idea about Accelerator and Detectors-Van de Graaff-Linear Accelerators-Synchrotrons-Geiger-Muller Detector-Scintillation Detectors-Type of Nuclear Reactions-Nuclear Fission-Nuclear Fusion-Nuclear Reactor-Classification of Reactors-Natural Uranium Reactor-Breeder Reactor- Nuclear Fusion-Stellar Energy.

UNIT-IV RADIATION CHEMISTRY **8 Hour**

Elementary Ideas of Radiation Chemistry-Radiolysis of Water and Aqueous Solutions-Unit of Radiation-Chemical Yield (G-Value)-Radiation Dosimetry (Fricke's Dosimeter)-Units of Radiation Energy (Rad, Gray, Roentgen, RBE, Rcm, Sievert). Interaction of Radiation with Matter-Radio Pharmaceutical Drugs.

UNIT-V NUCLEAR POLLUTION AND RADIOLOGY **6 Hour**

Radioactive Isotopes and their Applications-Isotopic Dilution Analysis-Neutron Activation Analysis-Disposal of Nuclear Waste- Nuclear Disaster and its Management-Nuclear Accidents and Holocaust.

Reference Books

- Choppin, G. R. (1994). *Radiochemistry and Nuclear Chemistry*. Elsevier. Amsterdam.
- Friedlander, G. Kennedy, J. W. Macias, E. S. Miller, J. M. (1981). *Nuclear and Radiochemistry.* John Wiley & Sons, Technology & Engineering. (3rd Ed.). United States.

Text Books

- Vértes**,** A. Nagy**,** S. Klencsár**,** Z. Lovas**,** R.G. Rösch**,** F. **(**2011). *Handbook of Nuclear Chemistry*. (1st Ed.). Springer. Germany.
- Grenier, J.J. (2020). *Handbook of Nuclear Chemistry*. Springer. (2nd Ed.). Germany.

ORGANIC PRACTICAL-I

UCHR206

Semester	**: II**	**Credit**	**: 02**
Category	**: Core Practical-II/ DSC Practical -II**	**Hour/Week**	**: 03**
Class & Major	**: I -B.Sc., Chemistry**	**Total Hour**	**: 39**

Objectives:

To enable the students

- Acquire Skills to Handle the Instruments.
- Analyse the Techniques involved in the Chromatography.

Learning Outcomes:

On completion of this course, the students will be able to

- **C**hecking the Calibration of the Thermometer.
- Know the Purification of Organic Compounds by Crystallization Using Solvents.
- Determine the Melting Points of Given Organic Compounds and Unknown Organic Compounds.
- Acquire the Knowledge of Chromatography Techniques to Separate the Mixture of Amino acids, Sugars and Other Organic Compounds.

1. Checking the Calibration of the Thermometer.
2. Purification of Organic Compounds by Crystallization Using the Following Solvents:
   a. Water b. Alcohol c. Alcohol-Water.

3. Determination of the Melting Points of Given Organic Compounds and Unknown Organic Compounds (Using Kjeldahl Method and Electrically Heated Melting Point Apparatus).
4. Effect of Impurities on the Melting Point – Mixed Melting Point of Two Unknown Organic Compounds.
5. Determination of Boiling Point of Liquid Compounds. (Boiling Point Lower Than and More Than 100 °C by Distillation and Capillary Method).
6. **Chromatography**
   a. Separation of a Mixture of Two Amino Acids by Ascending and Horizontal Paper Chromatography.
   b. Separation of a Mixture of Two Sugars by Ascending Paper Chromatography.
   c. Separation of a Mixture of o-and p-nitrophenol or o-and p-aminophenol by Thin Layer Chromatography (TLC).

Reference Books

1. Mann, F.G. & Saunders, B.C. (2009). *Practical Organic Chemistry*, Pearson Education. London.
2. Furniss, B.S. Hannaford, A.J. Smith, P.W.G. Tatchell, A.R. (2012). *Practical Organic Chemistry*. (5th Ed.). Pearson. London.

CHEMISTRY FOR BIOCHEMIST

UCHA103

Semester : I **Credit : 02**
Category : Allied **Hour/ Week : 03**
Class & Major: I B.Sc., Biochemistry **Total Hour : 39**

Objectives:

To enable the students

- Acquire the Basic Concepts in Structure and Bonding in the Molecular Structure.
- Interpolate the Concepts in Co-ordination Chemistry and Stereochemistry.
- Validate the Thermodynamic Derivations and Biomolecular Properties.

Learning Outcomes:

On completion of this course, the students will be able to

- Understand the Concept of Chemical Bonding.
- Chemistry involved in Co-ordination Compounds.
- Gain Knowledge Regarding Reaction Involved in Electrochemistry and Solutions.
- Acquire the Role of Biomolecules.

UNIT-I CHEMICAL BONDING **6 Hour**

Types of Bonds-Ionic, Covalent, Co-ordinate Bond and Metallic Bond. Hydrogen Bond, Vander Walls Interaction. VSEPR Theory- Shapes of H_2O, NH_3.

UNIT-II CO-ORDINATION CHEMISTRY **6 Hour**

Nomenclature of Co-ordination Compounds-Werner Theory –Chelation –Functions and Structure of Haemoglobin and Chlorophyll. Stereo Isomerism- Elements of Symmetry, Optical Activity- Isomerism of Lactic Acid and Tartaric Acid. Racemisation, Resolution, Geometrical Isomerism of Maleic Acid and Fumaric Acid.

UNIT-III KINETICS AND ELECTRO CHEMISTRY **9 Hour**

Chemical Kinetics- Order and Molecularity. First Order Rate Equation–Determination of Rate Constant of Hydrolysis of Ester. Catalysis- Catalyst- Auto Catalyst- Enzyme Catalyst – Promoters- Catalytic Poisoning- Active Center-Distinction Between Homogeneous and

Heterogeneous Catalysis-Industrial Application of Catalysts. Electro Chemistry-Specific and Equivalent Conductivity- their Determination Effect of Dilution of Conductance.

UNIT-IV SOLUTIONS **10 Hour**

Solutions: Solute-Solvent-Types of Solutions with One Example Each. - Strengths of Solutions- Calculation of Equivalent Weights- Normality, Molality, Molarity, Mole Fraction, Percentage by Weight & ppm. Preparation of Standard Solutions. First law of Thermodynamics- Concept of Internal Energy, Enthalpy. Thermochemistry- as Applied to Biochemical Reactions-Second law of Thermodynamics- Concept of Entropy, Free Energy, Criteria for Spontaneity**.** Water and its Effect on Biomolecules– Introduction-Water as Solvent- Proton Mobility-Ionic Product of Water-$_p$H scale-Buffering Against $_p$H Changes in Biological System- Henderson Equation – Biological Buffers.

UNIT –V BIOMOLECULES **8 Hour**

Polymer- Types of Polymerization- Addition and Condensation- Thermosetting and Thermoplastics- Rubber-Natural and Synthetic Fibers-Nylon-6 and 66, Polyesters, PE, PVC, Polyvinyl Acetate. Amino Acids- Classification and Sources of Amino Acids, Preparation and Properties of Glycine, Zwitter Ion Structure, Isoelectric Point.

Reference Books

- Malik, W.U. Tuli, G.D. and Madan, R.D. (2012). *Selected Topics in Inorganic Chemistry.* S.Chand Publications. (7th Ed.). India.
- Soni, P.L. (2011). *Text Book of Physical Chemistry.* Sultan Chand. (25th Revised Ed.). New Delhi.

Text Books

- Madan, R.D. (2012). *Modern Inorganic Chemistry.* S.Chand & Company Ltd. (5th Ed.). New Delhi.
- Puri, B.R. Sharma, L.R & Pathania, M.S. (2011). *Principles of Physical Chemistry.* Millennium Edition. Vishal Publishing & Co. Jalandhar. India.

ORGANIC ANALYSIS

UCHR104

Semester : I **Credit : 02**
Category : Allied Practical **Hour/ Week : 03**
Class &Major: I B.Sc., Biochemistry **Total Hour : 39**

Objectives:

To enable the students

- Identify the Analyzing Skills of Organic Functional Groups.
- Gain knowledge about confirmation test.

Organic Analysis

Reaction of the following functional group

Systematic Analysis of Organic Compound Containing One Functional Group & Characterization by Confirmatory Tests or Derivative.

1. Aldehyde (Aromatic).
2. Ketone (Aliphatic & Aromatic).
3. Carboxylic Acid (Mono & Di).
4. Carbohydrate (Reducing).
5. Phenol.
6. Aromatic Primary Amine.
7. Amide.
8. Diamide.

Reference Books

- Thomas, A.O. (2006). *Practical Chemistry.* Scientific Book Center. (2nd Ed.). Cannanore. Kerala.
- Venkateswaran, V. Veerasawamy, R. and Kulandaivelu, A.R. (2005). *Basic Principles of Practical Chemistry.* Chand S & Sons Publications. (2nd Ed.). New Delhi.

III & IV EVALUATION COMPONENTS OF CIA

Semester	Course Code	Course Title	Component III	Component IV
I	UCHM109	Inorganic Chemistry-I	Assignment	Seminar
	UCHM111	Analytical Chemistry	Assignment	Seminar
II	UCHM203	Organic Chemistry-I	Assignment	Seminar
	UCHM205	Nuclear & Radiation Chemistry	Assignment	Seminar

PROGRAMME PROFILE M.Sc., (Chemistry)

Programme Specific Outcomes (PSO)

Upon completion of the programme, the students will be able to

- Development of the Skills in Handling Various Chemicals, Apparatus and Instruments.
- Application of the Principles of Thermodynamics and Chemical Kinetics in Chemical Reactions
- Acquiring the Knowledge on Heterocyclic Compounds and Natural Products
- Ability to Apply the Basic Principles of Various Spectroscopic, Electro and Thermo Analytical Methods to Characterize the Compounds
- Industrial Insights on Polymers, Textile Dyes, Fiber and Medicinal Chemistry.

Sem ester	Category	Course Code	Course Title	Contact Hour/Week	Credits	
					Min	Max
I	Core-I/DSC-I	PCHM113	Organic Chemistry-I	5	4	4
	Core-II/DSC-II	PCHM114	Inorganic Chemistry-I	5	4	4
	Core-III/ DSC-III	PCHM115	Physical Chemistry-I	5	4	4
	Core-IV/DSC-IV	PCHM116	Analytical Chemistry	5	4	4
	Core Practical-I/ DSC Practical-I	PCHR203	Organic Practical	5	-	-
	Core Practical-1I/ DSC Practical-II	PCHR204	Inorganic Practical	5	-	-
			Total	**30**	**16**	**16**
II	Core-V/DSC-V	PCHM207	Organic Chemistry-II	5	4	4
	Core-VI/DSC-VI	PCHM208	Inorganic Chemistry-II	5	4	4
	Core-VII/DSC-VII	PCHM209	Physical Chemistry-II	5	4	4
	Core Practical-I/ DSC Practical-I	PCHR203	Organic Practical	5	5	5
	Core Practical-II/ DSC Practical-II	PCHR204	Inorganic Practical	5	5	5
	NME			5	4	4
	Service Learning	PCHX201	Vermicomposting	-	1	1
			Total	**30**	**27**	**27**
III	Core-VIII/DSC-VIII	PCHM301	Organic Chemistry-III	5	4	4
	Core-IX/DSC-IX	PCHM302	Inorganic Chemistry-III	4	4	4
	Core –X/DSC-X	PCHM303	Physical Chemistry-III	4	4	4
	AECC		Research Methodology	5	4	4
	Core-XI/GE	PCHI301	Sustainable Materials and Technologies	5	4	4
	Core Practical –III/ DSC Practical-III	PCHR401	Physical Chemistry Practical	5	-	-
	Core XVII/ DSC-XVII	PCHP401	Project	2	-	-
			Total	**30**	**20**	**20**
IV	Core-XIII/DSC-XIII	PCHM404	Organic Chemistry-IV	6	4	4
	Core-XIV/DSC-XIV	PCHM408	Inorganic Chemistry-IV	5	4	4
	Core-XV/DSC-XV	PCHM409	Physical Chemistry-IV	5	4	4
	Core-XVI/DSC-VI	PCHM411	Natural Products	5	4	4
	Core Practical –III/ DSC Practical	PCHR401	Physical Chemistry Practical	5	5	5
	Core XVII/ DSC-XVII	PCHP401	Project	4	6	6
			Total	**30**	**27**	**27**
			Grand Total	**120**	**90**	**90**

EXTRA CREDIT EARNING PROVISION

Semester	Category	Course Code	Course Title	Pervious Course Code	Hour per Week	Credits
						Min/Max
II	-	-	Online Course	-	-	-/2

ORGANIC CHEMISTRY-I

PCHM113

Semester : I **Credit : 04**
Category : Core I/DSC-I **Hour/Week : 05**
Class & Major : I M.Sc., Chemistry **Total Hour : 65**

Objectives:

To Enable the Students

- Learn Acidity and Basicity of Organic Acids and Bases.
- Understand the Aromaticity and its Importance in Organic Chemistry.
- Acquire the Knowledge of Elimination Reactions, its Synthetic Applications in Organic Chemistry and the Factors Affecting them.

Learning Outcomes:

On completion of the course, the students will be able to

- Understand Basics of Stereochemistry, Stereoisomers and Related Topics.
- Gain Knowledge about the Various Methods of Determining the Reaction Mechanisms.
- Acquire about the Various Types of Chemical Bonding and their Characteristics.

UNIT–I REACTION MECHANISM **12 Hour**

Factors Affecting the Strength of Acids and Bases – Bronsted and Lewis Concepts of Acids and Bases - Guidelines to Propose a Reasonable Reaction Mechanism – Energy Profile, Intermediate, Transition State – Kinetic and Thermodynamic Control – Hammond Postulate – Methods of Determining Reaction Mechanism – Kinetic Methods – Primary and Secondary Kinetic Isotopic Effect – Non Kinetic Methods – Isotope Labeling, Crossover Experiment, Trapping of Intermediates, Stereochemical Studies.

UNIT–II STEREOCHEMISTRY I **15 Hour**

Concepts of Chirality – Recognition of Symmetry Elements – Necessary and Sufficient Condition for Optical Activity – Chirality About a Center – Specification of Configuration by Cahn Ingold and Prelog Rule – Compounds with more than One Chiral Centre – Calculation of Number of Stereoisomers – Erthyro and Threo Nomenclature – Inter-Conversion of Sawhorse, Fisher and Newman Projections - The Concept of Prochirality – Topocity – Prostereoisomerism – Equivalent, Enantiotopic, Diastereotopic Ligands – Atropisomerism – Concept of Axial Chirality – R and S Nomenclature for Axially Chiral Molecules. Geometrical Isomerism – E and Z Nomenclature – Determination of Configuration of Geometrical Isomers by Physical and Chemical Methods.

UNIT–III ALIPHATIC SUBSTITUTION REACTIONS **12 Hour**

Distinction between Nucleophile and a Base –SN1 and SN2 Mechanisms – Kinetic and Stereochemical Features – Ion Pair Mechanism – Effects of Substrate Structure, Nature of Nucleophile, Solvent Polarity, Leaving Group Ability on the Course of the Reactions – SNi Reaction – Neighbouring Group Participation – Allylic and Vinylic Substitution. Mechanism of Aliphatic Electrophilic Substitution Reactions – SE1, SE2 and SEi Mechanisms.

UNIT–IV AROMATIC SUBSTITUTION REACTIONS 15 Hour

The concept of Aromaticity – Huckel's Rule and Identifying Aromaticity in Various Carbocyclic and Charged Species – Nonaromatic and Antiaromatic Systems – Effects of Aromaticity on Bond Length and Resonance Energies – Ring Current Effects – Chemistry of Fullerenes, Annulenes and Heteroannulenes. Mechanism of Aromatic Electrophilic Substitution Reactions – Pi and Sigma Complexes – Nitration, Halogenation, Sulfonation, Friedel Crafts Alkylation and Acylation Reactions, Reimer Tiemann Reaction – Orientation and Reactivity - Partial Rate Factors.-Aromatic Nucleophilic Substitution Reactions – SNAr, SN1 and Benzyne Mechanisms – Chichibabin Reaction - Linear Free Energy Relationship – Hammett Equation – Significance of sigma and Rho – Taft Equation.

UNIT–V ELIMINATION AND ADDITION REACTIONS 11 Hour

E1, E2 and E1CB Mechanisms - Structure and Solvent Effects - Orientation of Double Bonds – Regio and Stereoselectivities – Cis-Elimination Reactions – Competition Between Elimination and Substitution. Regio and Stereochemistry of Addition of Halogens and Halogeno Acids to Carbon Carbon Multiple Bonds – Hydroboration – Addition to Carbonyl Bond – Aldol, Perkin, Stobbe, Dieckmann Condensations, Reformatsky, Grignard, Mannich Reactions – Michael Addition – Formation and Applications of Enamines – Stork Enamine Reaction – Mechanisms of Ester Hydrolysis.

Reference Books

- March, J. (2007). *Advanced Organic Chemistry.* John Wiley. (6th Ed.). New York.
- Sykes, P.A. (2003). Guide book to *Mechanisms in Organic Chemistry.* Longmans Scientific and Technical. (6th Ed.). Essex.

Text Books

- Morrison and Boyd, R.T. (2010). *Organic Chemistry.* Prentice Hall of India. (6th Ed.). New Delhi.
- Eliel, E.L. (2001). *Stereochemistry of Carbon Compounds*. McGraw Hill. United States.
- Nasipuri, D. (2020). *Stereochemistry of Organic Compounds.* New Age International. (4th Ed.). New Delhi.

INORGANIC CHEMISTRY-I

PCHM114

Semester	**: I**	**Credit**	**: 04**
Category	**: Core II/DSC-II**	**Hour/Week**	**: 05**
Class & Major	**: I M.Sc., Chemistry**	**Total Hour**	**: 65**

Objectives:

To Enable the Students

- Learn the Solid State Chemistry.
- Understand Crystal Structure.
- Acquire the Basic Concept of Covalent Bond.

Learning Outcomes:

On Completion of the Course, the Student will be Able to

- Understand the Principles and Theories of Solid State Chemistry, Diffraction Methods, Bonding Nature and Inorganic Ring Systems.
- Understand the Different Approaches to Types of Chemical Bonding.
- Knowledge of Electronic Concepts of Structure of the Molecules.
- Understand the Nature and Effects of Metallic Bonding.
- Acquires Crystal Structures and Principles of Diffraction Methods.

UNIT–I SOLID STATE STRUCTURE **12 Hour**

Close Packing of Atoms and Ions – HCP and BCC Types of Packing – Voids, Radius Ratio Derivation and its Influence on Structures. Representative Structures of AB and AB2 Types of Compounds: Rock Salt, Calcium Chloride, Wurtzite, Zinc Blende, Rutile, Fluorite, Antifluorite, Cadmium Iodide and Nickel Arsenide. Structure of Graphite, Diamond and Spinels - Normal and Inverse Types -Perovskite Structures.

UNIT – II: CRYSTAL STRUCTURE **11 Hour**

Crystallographic Point Groups – Space Groups – Screw Axis and Glide Plane – Seven Crystal Systems and Bravais Lattice –Miller Indices- Interplanar Distances in Orthogonal Crystal Systems – X-ray Diffraction Studies – Powder and Rotating Crystal Methods – Systematic Absences and Lattice Types – Data Analysis for Cubic System – Electron Diffraction by Gases – Principles and Measurements – Determination of Structures – Comparison Between Electron, Neutron and X-Ray Diffractions.

UNIT–III COVALENT BONDING **15 Hour**

VB Approach to Bonding -Concept of Hybridisation and Structure of Molecules. VSEPR Theory - Shapes of Molecules. MO Approach to Covalent Bonding – Symmetry and Overlap of Atomic Orbitals – Symmetry of Molecular Orbitals – Sigma, Pi and Delta Bondings – Energy Levels in Homo and Hetero Nuclear Diatomic Systems – Bond Length, Bond Order and Bond Energy – Ionic Character in a Covalent Bond. The Concept of Multicentre Bonding. Structure and Bonding in Fluorine and Oxygen Compounds of Xenon, Di- and Tri-Nuclear Clusters of Rhenium Halides, Diborane and Tetraborane.

UNIT–IV METALLIC BONDING **15 Hour**

Drude Lorentz Model Merits and Demerits – Sommerfeld Model – Band Theory – Formation of Brillouin Zones – Conductors and Insulators – Semiconductors - Hall Effect – Photoconductivity - Superconductors, Point-, Line- and Plane Defects in Solids – Stoichiometric and Non-Stoichiometic Defects – Frenkel and Schottky Defects.Effect of Imperfections on Physical Properties Like Electrical Conductivity, Thermal, Optical and Magnetic Phenomena.

UNIT–V POLYMERIC INORGANIC COMPOUNDS **12 Hour**

Isopoly and Heteropoly Acids – Structure and Bonding of 6- and 12 – Isopoly and Heteropoly Anions. Structure of Silicates - Applications of Pauling's Rule of Electrovalence –One-, Two- and Three- Dimensional Silicates Synthesis and Structure of Ring and Cage Compounds–Borazine, Phosphazine, Carboranes and Sulfur-Nitrogen Compounds.

Reference Books

- Cotton, F.A. and Wilkinson, G. (2007). *A Text Book of Advanced Inorganic Chemistry*. Wiley. (6th Ed.). United States.
- Figgis, B.N. and Hitchman, M.A. (2010). *Ligand Field Theory and its Applications.* Wiley. United States.
- Wells, A.F. (1984). *Structural Inorganic Chemistry*. Oxford University Press. (5th Ed.). Oxford.
- Huheey, J. Keiter, E.A. Keiter, R.L. (1997). *Inorganic Chemistry: Principles of Structure and Reactivity*. (4th Ed.). Harper Collins, New York.

Text Books

- Jordan, R.B. (2007). *Reaction Mechanism of inorganic and Organometallic Systems*, (3rd Ed.). Oxford University Press.
- Douglas, B. Me Daniel, D.H. and Alexander, J.J. (2001). *Concepts and Models of Inorganic Chemistry*. John Wiley and Sons. New Delhi.
- Manku, G.S. (1994). *Theoretical Principles of Inorganic Chemistry*. Tata McGraw Hill Publishing Company Ltd. New Delhi.
- Chakrabarthy, D.K. (2005). *Solid State Chemistry*. New Age International Publishers. New Delhi.

PHYSICAL CHEMISTRY-I

PCHM115

Semester	**: I**	**Credit**	**: 04**
Category	**: Core III/DSC-III**	**Hour/Week**	**: 05**
Class & Major	**: I M.Sc., Chemistry**	**Total Hour**	**: 65**

Objectives:

To Enable the Students

- Acquire the Knowledge About the Essential Concepts of Physical Chemistry.
- Analyze the Quantum Mechanics.
- Knowledge of Principle of Group Theory and Application.

Learning Outcomes:

On Completion of the Course, the Student will be Able to

- Recall Basic Mathematical Concepts and Learn to Apply to Quantum Mechanics and Group Theory.
- Classify the Pre-Quantum Limitations and Need for the Quantum Mechanical Approaches.
- Illustrate Principles of Quantum Mechanics of Simple Systems.
- Apply Quantum Mechanical Treatment of Multi-Electron Systems.
- Apply Principles Governing Group Theory Through Construction of Character Tables.
- Analyze Symmetry and Chemical Bonding of Chemical Systems Through Group Theory.

UNIT–I BASIC MATHEMATICS AND FUNDAMENTALS OF QUANTUM CHEMISTRY **15 Hour**

Basic Mathematics-Exponential Functions, Vectors, Matrices, Determinants, Differentiation, Integration and Differential Equations. Operators, Algebra of Operators, Linear Operators, Setting up Operators of Linear Momentum, Angular Momentum, Kinetic

Energy and Total Energy of Systems-Writing the Hamiltonian for H and He Atoms-Eigen Functions and Eigen Values, Proving that Linear Momentum and Angular Momentum Operators are Linear, Hermitian Operator and its Properties, Commutator Theorem and its Converse, Expansion Theorem.

UNIT–II QUANTUM MECHANICS OF SIMPLE SYSTEMS 15 Hour

Introduction to Quantum Mechanics - Postulates of Quantum Mechanics-Black Body Radiation, Photoelectric Effect, De Broglie Equation and its Verification, Interpretation of Bohr's First Postulate in Terms of Wave Nature of Electron, Heisenberg Uncertainty Principle; Setting up the Schrödinger Equation,- Particles in 1D and 3D Boxes, Harmonic Oscillator, Rigid Rotator, Hydrogen Atom-Approximation Methods - Perturbation Theory (First Order and Non-Degenerate), the Variation Method, Linear Variation Principle, Helium - Hartree-Fock Self-Consistent Field Method .

UNIT–III APPLICATIONS OF QUANTUM CHEMISTRY 12 Hour

Chemical Bonding- VB & MO Theory as Applied to H^{2+}, Conjugated Hydrocarbons and Aromatic Hydrocarbons, Huckel MO Theory - Molecular Spectroscopy and Quantum Mechanics- Born Oppenheimer Approximation, Schrodinger Equation for Rotational, Vibrational and Electronic Components and their Selection Rules.

UNIT–IV PRINCIPLES OF GROUP THEORY 12 Hour

Introduction - Groups, Subgroups, Classes, Group Multiplication Table; Molecular Symmetry, Symmetry Elements and Operations–Products of Symmetry Operations; Classes Of Symmetry Operations and Point Group Classification of Molecules. Representations of Groups: Matrix Representation of Symmetry Operations, Reducible and Irreducible Representations; Statement of Great Orthogonality Theorem; Character Tables and their Construction.

UNIT–V: APPLICATIONS OF GROUP THEORY 11 Hour

Symmetry and Chemical Bonding: Formulating SALC's with Projection Operators, Formation of Hybrid Orbitals in Molecules Like BF_3, $[PtCl_4]^{2-}$ and CH_4, Molecular Orbital Theory for C2v (H_2O or NO^{2-}) and Td Compounds - Selection Rules for Electronic Transitions in Carbonyl Chromophore.

Reference Books

- McQuarrie, Donald A. (2003). *Quantum Chemistry.* Viva Books Private Limited. Chennai.
- Prasad, R.K. (1997). *Quantum Chemistry through Problems and Solutions.* New Age International Publishers. India.

Text Books

- Prasad, R.K. (2020). *Quantum Chemistry*. New Age. United States.
- Cotton, F.A. (2020). *Chemical Applications of Group Theory*. Wiley Eastern Ltd. United States.
- Ramakrishnan, V. and Gopinathan, M.S. (2013). *Group Theory in Chemistry*. Vishal Publications. India.
- Raman, K.V. (2004). *Group Theory and its Applications to Chemistry*. Tata McGraw-Hill. United States.

ANALYTICAL CHEMISTRY
PCHM116

Semester	**: I**	**Credit**	**: 04**
Category	**: Core IV/DSC-IV**	**Hour/Week**	**: 05**
Class & Major	**: I M.Sc., Chemistry**	**Total Hour**	**: 65**

Objectives:

To enable the students

- Understand the Basic Concepts of Analytical Process.
- Know About Instrument Analysis
- Various Techniques that are Involved in the Analytical Chemistry.

Learning Outcomes:

On completion of this course, the students will be able to

- Understand the Error Analysis of the Experimental and Instrumentals Studies
- Acquire the Skill to Determine the Functional Groups Present in Unknown Molecules Using IR and UV-Visible Spectra.
- Introduce Basic Analytical Techniques and Practical Aspects of Classical Chemical Separation by Chromatography and Mass Spectroscopy Analysis.
- Get Knowledge About Various Electrochemical Phenomena.
- Understand the Morphological Observations of the Materials and their Applications

UNIT–I ERRORS IN CHEMICAL ANALYSIS **12 Hour**

Systematic and Random Errors- Distribution of Experimental Results. Statistical Treatment- Standard Deviation, Variance, Confidence Limits, Application of Statistics to Data Treatment and Evaluation, Student-T and F Tests, Detection of Gross Errors, Rejection of A Result-Q Test, Estimation of Detection Limits. Least Square Method, Correlation Coefficient and its Determination.

UNIT–II SPECTRAL AND THERMAL TECHNIQUES **15 Hour**

Instrumentation of UV-Vis, AAS, AES and Spectrofluorimetry. Types of Optical Instruments, Components of Optical Instruments-Sources, Monochromators, Detectors-Sample Preparations- Applications in Quantitative Analyses. IR Spectrometry: Instrumentation Designs-Various Types of Sources, Monochromators, Sample Cell Considerations, Different Methods of Sample Preparations, FTIR Instruments Principles, Instrumentation and applications of Thermogravimetry Analtsis (TGA), Differential Thermal Analysis (DTA) and Differential Scanning Calorimetry (DSC).

UNIT–III CHROMATOGRAPHIC TECHNIQUES AND MASS SPECTROMETRY **12 Hour**

Principles of Chromatography: TLC, Column. Principles and Instrumentation of HPLC, GC, GC-MS Mass Spectrometry: Basic Principles – Molecular Ion Peak – Parent Peak – Fragments –Meta Stable Ion – Isotope Peaks – Determination of Molecular Weight and Molecular Formula – Fragmentation Pattern of Simple Organic Molecules – Mclafferty Rearrangement – Retro Diels Alder Reaction.

UNIT–IV ELECTROANALYTICAL TECHNIQUES **15 Hour**

Instrumentation - Different Types of Electrodes - Two Electrode and Three Electrode Cell Setup, Importance of Supporting Electrolyte, Mass Transport Processes - General Classification of Electro Analytical Techniques. Potentiometry - Ion Selective Electrodes and Measurement of Open Circuit Potential. Coulometry- Controlled Potential Coulometry, Constant Current Coulometry, Determination of Number of Transferred Electrons and Methods for Determination of the Thickness of Electrodeposits. Voltammetry Techniques – Polarography - Cyclic Voltammetry – Pulse Techniques (Normal Pulse,

Differential Pulse and Square Wave)-Stripping Voltammetry: Anodic, Cathodic and Adsorptive. Chronopotentiometry and Chronoamperometry.

UNIT–V INSTRUMENTATION ANALYSIS **11 Hour**

Principle, Instrumentation and Applications of PES (UPS and XPS), Aüger Electron Spectroscopy, Electron Microscopy (SEM and TEM), EDAX and SPM (STM and AFM).

Reference Books

- Ewing, G.W. (2019). *Instrumental Methods of Chemical Analysis*. McGraw Hill Pub. United States.
- Fritz, J.S. Gjerde, D.T. and Phlandt, C. (2009). *Ion Chromatography*. Huthing. Heidelberg.
- Paterson, R. (1970). *An Introduction to Ion Exchange*. Heydon – Sadtler. London.
- Knox, J.H. (1982). *High Performance Liquid Chromatography*. Edinburgh University Press. Edinburgh.

Text Books

- Williams, D.H. and Fleming, I. (2011). *Spectroscopic Methods in Organic Chemistry*. McGraw Hill. (6th Ed.). New York.
- Pavia, D.L. Lampman, G.M. and Kriz, G.S. (2001). *Introduction to Spectroscopy*. Brooks/Cole Publication. (3rd Ed.). Singapore.
- Fletcher, D. (1990). *Industrial Electrochemistry*. Chapman and Hall. London.
- Bockris, J. and Reddy, A.K.M. (2002). *Modern Electrochemistry*. Volume II. Mac Donold. London.
- Willard, Merit Dean and Settle. (2004). *Instrumental Methods of Analysis*. CBS Publishers and Distributors. (7th Ed.).

ORGANIC PRACTICAL

PCHR203

Semester : I & II **Credit : 05**
Category : Core Practical-I/DSC Practical-I **Hour/Week : 05**
Class & Major : I M.Sc., Chemistry **Total Hour : 65**

Objectives:

To enable the students

- Acquire the Skills in the Estimation & Preparation of Organic Compounds.
- Analyze the Various Isolation Techniques.

Learning Outcomes:

On completion of this course, the students will be able to

- Understand the Extraction Process.
- Acquire Skill about Estimation of Organic Compounds.
- Analyse the Qualitative Process of Mixture of Compounds.

I. Extraction

1. Isolation of Lactose from Milk(Demo)
2. Isolation of Caffeine from Tea Dust (Demo)
3. Isolation of Citric Acid from Lemon.

II. Qualitative Analysis

Identification of Components in a Two Component Mixture and Preparation of the Derivative.

III. Functional group inter conversion

a) Single stage

1. Hydrolysis.
2. Oxidation.
3. Reduction.
4. Nitration.
5. Acetylation

b) Double stage

1. Hydrolysis
2. Nitration

IV. Estimation

1. Estimation of Phenol.
2. Estimation of Aniline.
3. Estimation of Glucose.
4. Estimation of Ketone.
5. Estimation of Iodine, Saponification & Acetyl Value of Oil. (Demo)

V. Chromatographic Separations (demo)

1. Column Chromatography- Separation of Anthracene and Picric acid from Anthracenepicrate.
2. TLC Separation of Green Leaf Pigments

VI. Determination of Physical Constants (Melting Point)

Note: Two Sets of Questions can be Given for End Semester Examination as the following Lot System

1. Qualitative Analysis and Preparation.
2. Estimation and Preparation.

Text Books

- Gnanapragasam, N.S and Ramamoorthi, G. (2008). *Organic Chemistry Lab Manual*.Viswanathan Printers & Publishers Pvt. Ltd., India.
- Glasstone, S. (2010). *Statistical Thermodynamics.* Affiliated East West Press. NewDelhi.

Reference Books

- Thomas, A.O. (2005). P*ractical Chemistry,* Scientific Book Center, Cannanore, Kerala.
- Vogel's . (2009). *Text Book of Practical Organic Chemistry.* Longman. London.

INORGANIC PRACTICAL

PCHR204

Semester : I & II **Credit : 05**
Category : Core Practical-I/DSC Practical-I **Hour/Week : 05**
Class & Major : I M.Sc., Chemistry **Total Hour : 65**

Objectives

To enable the students

- Formulate the Preparation of Inorganic Complexes.
- Develop the Skills to Separate and Analyze the Inorganic Compounds.
- Analyze the Metal or Ions Present in the Compound or Substance by Volumetrically or Gravimetrically.

Learning Outcomes:

On completion of this course, the students will be able to

- Qualitative Analysis of Mixture Containing two Common and two Rare Cations.
- Understand the Concept of Preparation of Inorganic Complex.
- Learn the Estimation of Metal Ions by Volumetric and Gravimetrical Analysis.
- Acquire the Knowledge of Spectrophotometer.

I. Semi Micro Qualitative Analysis of Mixture Containing Two Common and Two Rare Cations.

The following are the Rare Cations to be Included. W, Ti, Mo, Te, Se, U,Th, Ce, Zr, V,Li, & Be.

II. Preparation of the following Complexes:

1. Potassium Tris (Oxalato) Chromate (III)
2. Bis (Acetyl Acetanato) Copper (II)
3. SodiumBis (Thiosulphato) Cuprate (II)
4. Tris (thiourea) Copper(I) Chloride

III. Estimation of metal ions by Volumetric and Gravimetrical analysis.

1. Estimation of Copper and Sulphate ion.
2. Estimation of Manganese and Nickel
3. Estimation of Copper and Zinc.
4. Estimation of Calcium and Magnesium.

IV. Spectro photometry (only for demonstration)

1. Estimation of Iron.
2. Estimation of Nickel.
3. Estimation of Copper.
4. Estimation of Manganese.

Note: Two sets of Questions can be Given for End Semester Examination as the FollowingLot System

1. Semi Micro Qualitative Analysis and Preparation.
2. Estimation of Metals by Volumetry & Gravimetry and Preparation.

Text Book

- Ramanujam, V. (2009). *Inorganic Semi Micro Qualitative Analysis.* The National Publishing Company. New Delhi.

Reference Books

- Thomas, A.O. (2005). *Practical Chemistry*. Scientific Book Center. Cannanore. (2nd Ed.). Kerala.
- Venkateswaran, V. Veerasawamy & Kulandaivelu, A. R. (2010). *Basic Principles of Practical Chemistry*. S. Chand & Sons publications. New Delhi.

ORGANIC CHEMISTRY-II

PCHM207

Semester	**: II**	**Credit**	**: 04**
Category	**: Core V/DSC-V**	**Hour/Week**	**: 05**
Class & Major	**: I M.Sc., Chemistry**	**Total Hour**	**: 65**

Objectives:

To enable the students

- Understand the Basic Concepts of Stereochemistry
- Know about Types of Reaction
- Various Type of Rearrangement.

Learning Outcomes:

On completion of this course, the students will be able to

- Inculcate the Basic Knowledge of Conformational Isomers and Various Inter/Intra Molecular Interactions and their Relative Stabilities.
- Teach the Role of the Conformation, Inter/Intramolecular Interactions in Directing the Various Mechanisms of Reactions in Acylic and Cyclic Systems.
- Introduce and Explain in Detail the Types of Reactions and the Reagents Employed in the Reactions.
- Teach Situations Wherein the Rearrangements are Taking Place. Also the Types of Various Rearrangements are to be Discussed in Detail with Mechanism.
- Inculcate the Basic Knowledge of Synthons and Other Terminology Used in Organic Synthesis.

UNIT–I CONFORMATIONAL ANALYSIS 15 Hour

Restricted Rotation in C-C Bonds – Conformation of N-Butane – Conformational Isomers –Conformational Free Energy – Population of Conformers – Influence of Dipole Dipole Repulsion, Van Der Walls Forces – Intramolecular Hydrogen Bonding on the Stability of Conformers. Cyclohexanes – Stability and Isomerism in Mono and Di Substituted Cyclohexanes – Flexible Forms – A1,2 Strain and A1,3 Strain – Conformation of Cyclohexanone and 2-Halocyclohexanones – Alkyl Ketone Effects – Anomeric Effect. Conformation of Decalin, Perhydrophenanthrene and Perhydroanthracene.

UNIT–II STEREOCHEMISTRY II 11 Hour

Conformation and Reactivity in Acylic Systems – Steric and Steroelectronic Effects – Cis-Elimination, Streospecific and Streoselective Reaction-E2 Elimination, Intramolecular Rearrangements – Neighbouring Group Participation. Cyclohexyl Systems - Esterification – Oxidation - Substitution Reaction - E2 Elimination - Intramolecular Rearrangements – Neighbouring Group Participation – Formation and Cleavage of Epoxide. Reactivity in Decalyl Systems- Reactions of Enols and Enolates.

UNIT–III REAGENTS IN ORGANIC SYNTHESIS 15 Hour

Use of the Following Reagents in Organic Synthesis and Functional Group Transformations: Complex Metal Hydrides, Gilmans Reagent, Lithium Diisopropylamide, Dicyclohexylcarbodiimide, Trimethylsilyl Iodide, Tri-N-Butyltin Hydride, Osmium Tetroxide, DDQ, Wilkinsons Catalyst and Bakers Yeast. Woodward Prevost Hydroxylation, Peterson Synthesis, Collins Reagent, Samarium Iodide, Raney Ni, Sharp Less Asymmetric Epoxidation – 1,3-Dithiane.

UNIT–IV MOLECULAR REARRANGEMENTS 11 Hour

Migratory Aptitudes – Nucleophilic, Electrophilic and Free Radical Rearrangements, Intermolecular and Intramolecular Rearrangements – Wagner Meerwein,

Pinacol-Pinacolone, Benzil-Benzilic Acid, Schimidt, Hoffmann, Lossen, Curtius, Fries, Beckmann, Faavorski, Stevens, Neber Rearrangements

UNIT–V RETRO SYNTHESIS **13 Hour**

Importance of Synthesis – Carbon-Carbon Bond Making Reactions – Functional Group Modifications – Reterosynthetic Analysis – Synthons and Synthetic Equivalents – Nucleophilic, Electrophilic, Electroneutral and Free Radical Synthons – Retron, Partial Retron and Super Retron - Chiron – Umpolung – Protection and Deprotection – Product, Chemo, Regio and Stereoselectivities. One and Two Group Disconnections – Diels Alder Reactions – Robinson Annulation Method – 1,2- 1,3- 1,4- 1,5- and 1,6-Difunctional Compounds.

Reference Books

- Eliel, E.L. Wilen, S. H. Mander, L.N. (2008). *Stereochemistry of Organic Compounds*. John Wiley and Sons. Inc. New Delhi.
- Ireland, R.E. (1969). *Organic Synthesis*. Prentice Hall. United States.

Text Books

- Turner, S. (1976). *Design of Organic Synthesis*. Elsevier. Amsterdam.
- Warren, S. (1978). *Designing Organic Synthesis – A Programmed Introduction to Synthon Approach.* Wiley. New York.

INORGANIC CHEMISTRY-II

PCHM208

Semester	**: II**	**Credit**	**: 04**
Category	**: Core VI/DSC-VI**	**Hour/Week**	**: 05**
Class & Major	**: I M.Sc., Chemistry**	**Total Hour**	**: 65**

Objectives:

To enable the students

- Understand the Basic Concepts of Coordination Compound.
- Acquire the Knowledge of Inorganic Reaction Mechanism.
- Various Metal that are Involved in the Bioinorganic Chemistry.

Learning Outcomes:

On completion of this course, the students will be able to

- Learn Crystal Field Theory and MO Theory of Coordination Compounds.
- Be Able to Recognize the Types of Isomers in Coordination Compounds.
- Learn the Structure and Bonding in Transition Metal Compounds with Ligands Commonly Encountered in Organometallic Chemistry.
- Understand the Structure, Reactivity and Applications of Acceptor Complexes.
- Understand the Role of Metal Ions in Hb, Mb, Enzymes, Vitamins and Other Biological Systems.

UNIT–I CHEMISTRY OF COORDINATION COMPOUNDS **11 Hour**

Werner's Coordination Theory-Isomerism in Coordination Compounds – Types of Ligands and Chelate Effect – Stability Constant Determination. VB Theory and CFT - Splitting of D-Orbitals Under Different Geometries – CFSE – Evidence for CFSE – Structure of Spinels – Factors Affecting CFSE – Spectrochemical Series – Jahn-Teller Distortion – M.O. Theory of Bonding – Sigma and Pi-Bonding in Coordination Compounds.

UNIT–II INORGANIC REACTION MECHANISMS **15 Hour**

Electron Transfer Reactions: Outer-Sphere and Inner Sphere Electron Transfer Reactions – the Marcus Theory – Non-Complementary Reactions – Synthesis of

Coordination Compounds by Electron Transfer Reactions. Substitution Reactions : Substitution Reactions of Square Planar Complexes of Pt(II) and Other D8 Metal Complexes – Significance of Trans-Effect – Substitution Reactions of Octahedral Complexes – Acid and Base Hydrolysis Reactions – Anation Reactions – Synthesis of Coordination Compounds by Substitution Reactions. Molecular Rearrangements and Reactions of Coordinated Ligands – The Template Effect and Macrocyclic Ligands.

UNIT–III ORGANOMETALLICS **14 Hour**

Metal Alkyl and Aryls – 18 Electron Rule – Olefin and Acetylene Complexes – Zeise's Salt – Dewar-Chatt Approach to Bonding in Ethylene and Acetylene Complexes – Cyclopentadiene, Benzene and Cyclobutadiene Complexes of Transition Metals – their Preparations, Bonding and Reactions. Homogeneous Catalysis Involving Organometallics: Oxidative Addition and Reductive Elimination Reactions – Hydrogenation, Isomerization and Hydroformylation of Olefins – Carbonylation of Methanol, Oxidation of Olefins (Wacker's Process) - Heterogeneous Catalysis – Ziegler-Natta Catalysis.

UNIT–IV π-ACCEPTOR COMPLEXES **10 Hour**

Synthesis, Structure and Bonding of Mono Nuclear and Poly-Nuclear Carbonyls – Nitrosyl Complexes – Dinitrogen Complexes – Metal Carbonylato Complexes, Carbonyl Hidrides and Complex Metal Cyanides.

UNIT–V BIOINORGANIC CHEMISTRY **15 Hour**

Metalloporphyrins – Chlorophyll, Hemoglobin and Myoglobin – Structure and Function of Hemoglobin Cytochromes. Metalloenzymes, Enzyme Action Inhibition and Restoration – Carboxypeptidase-A and Carbonic Anhydrase – Vitamin B12 and B12 Coenzymes. Metalloproteins – Non-Heme Iron Proteins – Rubredoxin and Ferredoxin – Copper Proteins and their Classification – Nitrogenases, their Structure and Function. Metal Ions in Biology -–Sodium Ion Pump – Metal Poisons and Chelating Agents in Medicine.

Reference Books

- Cotton, F.A. and Wilkinson, G. (2007). *A Text Book of Advanced Inorganic Chemistry.* Wiley. (6th Ed.). United States.
- Cotton, F.A. (2008). *Chemical Applications of Group Theory*. Wiley. United States.
- Drago, R.S. (2012). *Physical Methods in Inorganic Chemistry*. Van Nostrand Reinhold. (2nd Ed.).
- Figgis, B.N. and Lewis, J. (1996). *The Magneto Chemistry of Complex Compounds in Modern Coordination Chemistry.* Lewis & Wilkins, Interscience, New York.
- Drago, Russell. S. (2016). *Physical Methods for Chemists.* East West Press Pvt. Ltd. (2nd Ed.).

Text Books

- Douglas, B. McDaniel, D.H. and Alexander, J.J. (2001). *Concepts and Models of Inorganic Chemistry*. John Wiley and Sons. New Delhi.
- Mabbs, F.E. and Machin, D.J. (2008). *Magnetism and Transition Metal Complexes.* Dover Publications. New York.
- Roberts, A.P. (2016). *Polyoxometalates: Properties, Structure and Synthesis*. Nova Science Publishers. New York.

PHYSICAL CHEMISTRY-II

PCHM209

Semester	**: II**	**Credit**	**: 04**
Category	**: Core VII/DSC-VII**	**Hour/Week**	**: 05**
Class & Major	**: I M.Sc., Chemistry**	**Total Hour**	**: 65**

Objectives:

To enable the students

- Basic Concept of Spectroscopy in Physical Chemistry.
- Know About Application of Spectroscopy
- Get Knowledge of Nuclear Magnetic Spectroscopy.

Learning Outcomes:

On completion of this course, the students will be able to

- Learn Origin and Principles of Microwave Spectroscopy and Infrared Spectroscopy and Apply to Simple Chemical Molecules.
- Understand Origin and Principles of Raman Spectroscopy, Electronic Spectroscopy and Fluorescence Spectroscopy.
- Gain Knowledge on the Origin and Principles of FT-NMR Spectroscopy.
- Critically Analyze the Origin of Various NMR Parameters and Principles of 2D-NMR Spectroscopy.
- Demonstrate the Origin and Principles of EPR/ESR Spectroscopy and their Applications to Organic Radicals and Paramagnetic Complexes.

UNIT–I ROTATIONAL AND VIBRATIONAL SPECTROSCOPY 14 Hour

Electromagnetic Radiation - Interaction of Electromagnetic Radiation with Molecules - Types of Molecular Spectroscopy - Factors Affecting Line width and Intensity - Signal to Noise Ratio and Resolving Power - Absorption and Emission Spectroscopy. Microwave Spectroscopy - Rotation of Molecules - Rotational Spectra of Rigid Rotator, Intensities of Rotational Lines, Effect of Isotopic Substitution - Rotational Spectrum of Non-Rigid Rotator - Linear & Symmetric Top Molecules - Stark Effect. Applications of Microwave Spectroscopy - Determination of Bond Length, Bond Angle Dipole Moment and Atomic Mass from Microwave Spectra. Infrared Spectroscopy: Vibrating Diatomic Molecule - Harmonic and Anharmonic Oscillators - Diatomic Vibrating Rotator - Vibrations of Polyatomic Molecules - Molecular Vibrations, Types Of Molecular Vibrations, Rotational Vibrational Spectra of Linear and Symmetric Top Molecules. Raman Spectroscopy- Classical and Quantum Theory of Raman Effect- Rotational Raman Spectra- Linear, Symmetric Top Molecules-Vibrational Raman Spectra- Raman Activity of Vibrations, Rule of Mutual Exclusion, Polarizability Ellipsoids- Rotational Fine Structures- Resonance Raman and Laser Raman Spectroscopy.

UNIT–II ELECTRONIC AND FLUORESCENCE SPECTROSCOPY 14 Hour

Electronic Spectra of Diatomic Molecules-the Born-Oppenheimer Approximation, Vibrational Coarse Structure: Progressions, Intensity of Vibrational-Electronic Spectra: Franck-Condon Principle, Dissociation Energy and Dissociation Products, Rotational Fine Structure of Electronic-Vibration Transitions, Fortrat Diagram-Pre-Dissociation. Fluorescence and Phosphorescence – Jablonski Diagram – Fluorescence Spectroscopy – FRET.

UNIT–III NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY-I 13 Hour

Nuclear Spin States and NMR Active Nuclei, Nuclear Magnetic Moments- Mechanism of Resonance Absorption- Population of Nuclear Spin States, Proton NMR- Interaction of Spin Magnetic Moment of a Proton with External Magnetic Moment,

Chemical Shift and Shielding. Nuclear Spins in a Magnetic Field - Zeeman Effect -Larmor Precession -Resonance Phenomenon -Bloch Equations -Spin - Lattice and Spin-Spin Relaxation Times -Nuclear Shielding and Chemical Shift -Spin-Spin Coupling – Basic Principles of FT NMR -inversion recovery and CPMG Sequenced for T1 and T2 Measurements.

UNIT–IV NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY-II 12 Hour

Analysis of Complex NMR Spectra -Chemical Equivalence, Chemical Environment, Spin-Spin Splitting, Coupling Constant, Geminal, Vicinal, Long-Range, Trans, Aromatic, Allylic Coupling, Factors Influencing Coupling Constant, Splitting of NMR signals- AB, AX and AMX Types -Overhauser Effect - NMR of Paramagnetic Compounds -Relaxation by Paramagnetic Ions in Solution - INDOR, CIDNP - 2 Dimensional NMR - Pulse Sequences - NMR in Solids -Magic Angle Spinning -Chemical Shift Anisotropy - NMR Imaging - MRI.

UNIT–V ELECTRON PARAMAGNETIC RESONANCE SPECTROSCOPY 12 Hour

Electron Spin - Electronic Zeeman Effect – Presentation of the Spectrum-EPR Spectrum of Hydrogen Atom (First Order Treatment) - G Factors - Hyperfine Splitting: Nuclear Spin (I = 1/2, 1, 3/2, 5/2) Interaction with electron Spin - Hyperfine Coupling Constants - EPR Spectra of Organic Radicals (AA and AB type) - EPR Spectra of Heteronuclear Compounds - Mcconnell's Relation – Introduction to Multi-Electron Systems: Zero Field Splitting – Multi-Electron Systems-Kramer's Degeneracy - Applications of EPR Spectra for Inorganic Compounds - Anisotropy in the Hyperfine Coupling Constant - EPR Instrumentation.

Reference Books

- Kemp, W. (2019). *Organic Spectroscopy*. Macmillan Press Ltd. London.
- Russel, S.Drago. (2016). *Physical Methods for Chemists*. Affiliated East-West Press Pvt. Ltd. New Delhi.
- Robert, M.Silverstein, Francis X. Webster, David J. Kiemle, David L. Bryce. (2015). *Spectrometric Identification of Organic Compounds*. Wiley. (7th Ed.). USA.

Text Books

- Jag, Mohan. (2004). *Organic Spectroscopy, Principles and Applications*. Narosa Publishing House, Chennai.
- Aruldhas, G. (2001). *Molecular Structure and Spectroscopy*. Prentice-Hall of India Pvt. Ltd. New Delhi.
- Banwell, C.N. and McCash, E.M. (2013). *Fundamentals of Molecular Spectroscopy*. Tat McGraw-Hill Publishing Co. Ltd. (5th Ed.). New Delhi.

VERMICOMPOSTING

PCHX201

Semester : II **Credit :1**

Category : Service Learning **Total Hour :40**

Class &Major : I M.Sc., Chemistry

Target Group : Villagers in the Age Group of 20-50 years

Objectives:

To enable the students

- Create Awareness About Utilization of Natural Fertilisers to the Society.
- Implement Vermicomposting at a small scale.

Learning Outcomes:

On completion of this course, the students will be able to

- Understanding the role of Worm Farming in Modern Farming.
- Understanding the Potential of Vermicompost as an Alternative to Chemical Fertilizers.
- Role of Vermicultre in Maintaining the Health of Soil and Humans.
- Economic Importance of Vermiculture.
- Role of Vermicuture on Protecting the Environment and Managing the Waste.

UNIT – I INTRODUCTION **8 Hour**

Definition – Usage – Advantage of Over Artificial Fertilisers, Ingredients **Activity:** Spreading Awareness on Vermicomposting.

UNIT–II BIO-DEGRADABLE & NON BIODEGRADABLE **8 Hour**

Introduction, Organic Waste, Difference in Biodegradable & Non-Biodegradable Common Items Suitable for Biocomposting: Clean Paper, Dried Net, Egg Shell, Leaves Garden Trimming, Fruits & Vegetables Wastes, Coffee & Tea Extract. **Activity:** Separation & Collection of Biodegradable & Non-Biodegradable.

UNIT–III VERMI GROWTH **8 Hour**

Earthworm – Introduction-Nature of Soil Required – Easily Usable Waste – Factors Affecting Growth of the Vermi. **Activity:** Vermi Growth in Soil-Earthworm.

UNIT-IV VERMICOMPOSTING METHOD **8 Hour**

Grub Composting – Compost Tea – Humanure – Vermicompost – Bokashi Composting Common. **Activity:** Carrying out the Methods & Identifying the most Effective Method to beused.

UNIT–V FEEDBACK & RESULT FROM SOCIETY **8 Hour**

Evaluation of Results & Difference in Plant Growth with Vermicompost Oral & Written Feedback from Villagers. **Activity:** Measurement of Plant Growth Assessment of Utilization of Household Waste.

Reference Books

- Thompson, P.M. Das, S.A. K.C. (2005). *Bioresource Technology*. United Kingdom.
- Nancarrow, Loren and Janet Hogan Taylor. (2007). *The Worm Book.* Ten Speed Press. California.
- Logsdon, Gene. (2009). *Worldwide Progress in Vermicomposting* Biocycle. USA.

APPLIED CHEMISTRY
PCHE104

Semester : I **Credit : 4**
Category : Non-Major Elective **Hours/Week : 5**
Class & Major : I PG **Total Hours : 65**

Objectives:

To enable the students

- Provide Basic Knowledge in Chemistry involved in Daily Life.
- Recognizes the Uses of Food and Nutrition.
- Implications of Chemistry in Pharma Drugs and Fertilizers.

UNIT-I GENERAL SURVEY OF CHEMICALS USED IN EVERYDAY LIFE 13 Hour

General Survey of Chemicals used in Everyday Life. Cosmetics –Talcum Powder, Tooth Paste, Shampoo, Nail Polish, Perfumes, Soaps and Detergents, - General Formation and Preparation – Hazards of Cosmetic Use.

UNIT – II FOOD AND NUTRITION 13 Hour

Food and Nutrition – Carbohydrates, Proteins, Fats, Minerals and Vitamins – Definition, Sources and their Physiological Importance – Balanced Diet. Adulterants – in Milk, Ghee, Oil, Coffee Powder, Tea, Asafoetida, Chilli Powder, Pulses and Turmeric Powder – Identifications.

UNIT – III CHEMICALS IN FOOD PRODUCTION 13 Hour

Chemicals in Food Production – Fertilizers in Used in Natural Sources – Fertilizers – urea, NPK and Super Phosphates – Needs, Uses and Hazards.

UNIT- IV POLYMERS 13 Hour

Plastics, Polyethene, PVC, Bakelite, Poly Esters, Resins – Properties and Applications. Natural Rubber, Synthetic Rubber- Vulcanization – Definition and its Applications – Color Chemicals used in Food – Soft Drinks- and its Health Hazards.

UNIT – V DRUGS 13 Hour

Pharmaceutical Drugs – Analgesics and Antipyretics – Antibiotics – Definition, Examples and its Applications. Antiseptics – Disinfectants, Definition, Examples and Applications. Explosives – Classification and its Examples.

Text Books

- Sharma, B.K. (2006). *Industrial Chemistry*. Goel Publication. (1st Ed.). Meerut.
- Charabarthy, B.N. (2007). *Industrial Chemistry.* Oxford and IBH Publishing. (1st Ed.). New Delhi.

Reference Books

- Gowariker, V.P. Viswanathan, N.V. (2005). *Polymer Science*. Wiley Easter Pvt. Ltd. (1st Ed.). New Delhi.
- Ghosh, Jayashree. *Text Book of Pharmaceutical Chemistry.* S. Chand & Co. Ltd. (3rd Ed.). New Delhi.
- Krishnamoorthy, P. Vallinayagan. Jaya Subramanian, K. (2007). *Applied Chemistry*. Tata MaGraw-Hill Publishing Co. Ltd. (2nd Ed.). New Delhi.

III & IV EVALUATION COMPONENTS OF CIA

Semester	Course Code	Course Title	Component III	Component IV
I	PCHM113	Organic Chemistry-I	Mechanism writing	Seminar
	PCHM114	Inorganic Chemistry-I	Paper Presentation	Seminar
	PCHM115	Physical Chemistry-I	Problem solving	Seminar
	PCHM116	Analytical Chemistry	Assignment	Seminar
II	PCHM207	Organic Chemistry-II	Rearrangement writing	Seminar
	PCHM208	Inorganic Chemistry-II	Poster Presentation	Seminar
	PCHM209	Physical Chemistry-II	Assignment	Seminar

PG & RESEARCH DEPARTMENT OF MATHEMATICS

PREAMBLE

UG: Programme Profile and the Syllabi of Courses offered in the I and II Semester along with Evaluation Components III&IV (With Effect From 2021- 2024 Batch Onwards).

PG: Programme Profile and the Syllabi of Courses offered in the I and II Semester along with Evaluation Components III&IV (With Effect From 2021- 2023 Batch Onwards)

PROGRAMME PROFILE B.Sc. (Mathematics)

Programme Specific Outcomes (PSO)

Upon Completion of the Programme, the Students will able to

- Interpret the effective use of Mathematical Skills to solve Quantitative Problems from a wide Array of Authentic Contexts.
- Apply Mathematical Arguments in Axiomatic and Non-axiomatic Systems.
- Demonstrate the Effective written Communication of Mathematical concepts.
- Formulate and Develop Mathematical Arguments in a Logical Manner.

Semester	Part	Category	Course code	Course Title	Previous course code	Contact Hrs/ Week	Credit Min/Max
I	I	Languages / AECC – II Tamil / Hindi/ French	UTAL107/ UTAL108/ UHIL102/ UFRL102	Basic Tamil-I/ Advanced Tamil-I/ Hindi-I / French-I	UTAL105/ UTAL106/ UHIL101/ UFRL101	5	3/4
	II	Communicative English / AECC – I	UENL109/ UENL110	English for Communicative (Stream – I) / English for Communicative (Stream –II)	-	5	3/4
	III	Major Core (I)/ DSC (I)	UMAM104	Differential Calculus	-	6	4
	III	Major Core (II)/ DSC (II)	UMAM107	Algebra and Trigonometry	-	6	4
	III	Allied – I (GE)	UMAA115	Mathematical Statistics - I	-	6	4
	III	PE	UPEM101	Professional English	-	6	4
	IV	Value Education (VE)				2	1
					TOTAL	**36**	**23/25**
II	I	Languages / AECC – II Tamil/ Hindi/ French	UTAL207/ UTAL208/ UHIL202/ UFRL202	Basic Tamil II/ Advanced Tamil-II/ Hindi-II / French-II	UTAL205/ UTAL206/ UHIL201/ UFRL201	5	3/4
	II	Communicative English / AECC – I	UENL209 / UENL210	English for Communicative (Stream – I) / English for Communicative (Stream –II)	-	5	3/4
	III	Major Core III / DSC (III)	UMAM207	Vector Calculus	-	6	5
	III	Major Core IV / DSC(IV)	UMAM208	Analytical Geometry	UMAM105/ UMAM106	5	5
	III	Allied – II (GE)	UMAA207	Mathematical Statistics - II	-	6	4
	III	PE	UPEM201	Professional English II	-	6	4
	IV	Non Major Elective			-	3	2
	V	Extension Programme/ Physical Education			-	-	1/2
					TOTAL	**36**	**27/30**
III	I	Languages / AECC – II Tamil/ Hindi/ French	UTAL307/ UTAL308/ UHIL302/ UFRL302	Basic Tamil II/ Advanced Tamil-II/Hindi-II / French-II	UTAL305/ UTAL306/ UHIL301/ UFRL301	5	3/4

III	II	Communicative English / AECC – I	UENL309/ UENL310	English for Communicative (Stream – I) / English for Communicative (Stream –II)	-	5	3/4
	III	Major Core V / DSC(V)	UMAM306	Differential Equation	UMAM302/ UMAM301	5	4
	III	Major Core VI / DSC (VI)	UMAM308	Discrete Mathematics	UMAM206/ UMAM606	6	6
	III	Allied – III (GE)	UCSA303	Mathematical Programming using C	-	3	2
	III	Allied - III (GE) Practical	UCSR305	Mathematical Programming using C Practical	-	3	2
	IV	Online Course (NPTEL / SP)			-	3	1/2
	IV	Value Education (VE)			-	2	1
					TOTAL	**33**	**23/26**
IV	I	Languages / AECC – II Tamil/ Hindi/ French	UTAL407/ UTAL408/ UHIL402/ UFRL402	Basic Tamil II/ Advanced Tamil-II/ Hindi-II / French-II	UTAL405/ UTAL406/ UHIL401/ UFRL401	5	3/4
	II	Communicative English / AECC – I	UENL409/ UENL410	English for Communicative (Stream – I) / English for Communicative (Stream –II)	-	5	3/4
	III	Major Core VII / DSC (VII)	UMAM407	Integral Transforms	UMAM405	4	4
	III	Major Core VIII / DSC (VIII)	UMAM406	Mechanics	UMAM401	5	4
	III	Allied – IV (GE)	UPHA402	Electronics for Mathematics	-	3	2
	III	Allied – IV Practical	UPHR402	Electronics for Mathematics Practical	-	3	2
	IV	Soft Skill			-	2	1
	IV	Non Major Elective			-	3	2
	V	Extension Programme/ Physical Education			-	-	-/2
					TOTAL	**30**	**21/25**
V	III	Major Core IX / DSC (IX)	UMAM507	Modern Algebra	UMAM501	6	5
	III	Major Core X / DSC (X)	UMAM512	Real Analysis I	UMAM508	6	5
	III	Major Core XI / DSC (XI)	UMAM506	Numerical Methods		6	5
	III	Major Elective	UMAO501	Graph Theory	UMAM205/ UMAM402	5	4
			UMAO502	Number Theory	UMAM506/ UMAM502		
	III	Major Core XII/ DSC (XII)	UMAP501/ UMAR511	Project/ R Programming	-	5	5
	IV	Value Education (VE)				2	1
					TOTAL	**30**	**25**
VI	III	Major Core XIII/ DSC (XII)	UMAM614	Linear Algebra	UMAM604/ UMAM610	5	5
	III	Major Core XIV/ DSC (XIV)	UMAM615	Real Analysis II	UMAM607/ UMAM611	6	6
	III	Major Core XV/ DSC(XV)	UMAM602	Complex Analysis	UMAM509	6	6
	III	Major Core XVI/ DSC(XVI)	UMAM613	Operations Research	UMAM603/ UMAM608	6	6
	III	Major Elective	UMAO607	Mathematical Modeling	UMAM404	5	4
			UMAO606	Mathematics for Construction Craft	-		
			UMAO607	Mathematics in Space Science	-	5	4
	III	Comprehensive Viva	UMAM601		-	-	1
	IV	Soft Skill			-	2	1
	V	Extension Programme/ Physical Education			-	-	-/2
					TOTAL	**30**	**29/31**
					GRAND TOTAL	**195**	**148/162**

COURSES OFFERED TO OTHER DEPARTMENTS-UG ALLIED

Class & Major	Semester	Category	Course Code	Course Title	Previous course code	Contact Hrs/ week	Credit Min/ Max
I B Com & I BCom (CA)	I	Allied	UMAA112	Business Mathematics	-	6	4
I B.Sc PHY			UMAA114/UMAA310	Allied Mathematics I	UMAA106	6	4
I BCA			UMAA110	Mathematical Methods I	-	6	4
I B.Sc (CS)			UMAA113	Statistical Methods	-	6	4
I B.Sc (CS)	II		UMAA218	Mathematics for Computer Science	-	6	4
II BCA			UMAA216	Mathematical Methods II	-	6	4
I B.Sc PHY			UMAA222	Allied Mathematics II	UMAA212	6	4
II B.Sc Chem	III		UMAA310/UMAA114	Allied Mathematics I	UMAA304	6	4
II B.Sc BIO			UMAA305	Bio-Statistics	-	6	4
II BBA/ II B.Com/ II B.Com CA			UMAA301	Business Statistics	UMAA211/ UMAA403/ UMAA107	6	4
II B.Sc Chem	IV	Allied	UMAA406	Integral Calculus, Laplace Transform And Ordinary Differential Equations	-	6	4
II BBA			UMAA410	Quantitative techniques for Business	UMAA505	6	4

NON-MAJOR ELECTIVE

Semester	Part	Category	Course Code	Course Title	Previous Course Code	Contact Hrs/ Week	Credit
II	IV	Non Major Elective	UMAR201	Statistics using Excel	-	3	2
			UMAE204	Basic Mathematics for Science	-	3	2
			UMAE202	Mathematics for Business and Decision Making	-	3	2
			UMAE206	Numerical Methods using C++	UIDE302/ UMAE302	3	2
			UMAE209	Operations Research for Managers	UMAE306/ UMAE402	3	2
			UMAE207	Statistical Data Analysis through SPSS	UMAA501/ UMAE305	3	2
			UMAE208	Applied Mathematics	UMAE309/ UMAE502	3	2
IV	IV	Non Major Elective	UMAE404	Mathematics for Career Development	-	3	2

EXTRA CREDIT EARNING PROVISION

Semester	Part	Category	Course code	Course Title	Contact Hrs/ Week	Credit	
						Min	Max
II	III	Summer Internship	UMAI201	Summer Internship	-	-	1
IV	III		UMAI401	Summer Internship	-	-	1
VI	III	Self Study paper	UMAS601 UMAS602 UMAS603 UMAS604	Fourier Transforms Simulation Number Theory Project	2	-	2

EXPERIENTIAL LEARNING (Mandatory)

Course Mapping				Collaborating Agency – MSME		
Semester	Course code	Course Title	Assessment	Course Title	Hour/ Days/ Month	Mode of Evaluation
I	UMAA115	Mathematical Statistics - I	Component IV	Applied Statistics Certification	2 Days	Reflection

SKILL ORIENTATION PROGRAMME
(Only for Interested students) – Extra Credit Earning Provision

Semester	Category	Course Code	Course Title	Collaborating Agency	Hour/ Days/ Month	Mode of Evaluation	Credits (Min/Max)
II	Core	UMAT201	Statistics Process Control	**MSME**	4 Days	Reflection	1

DIFFERENTIAL CALCULUS

UMAM104

Semester : I **Credit : 4**
Category : Major Core I / DSC I **Hour/Week : 6**
Class & Major : I- B.Sc Mathematics **Total Hour: 78**

Objectives

To enable the students

- Understand Functions, Limits, Derivative, Continuous and Inverse Trigonometrically Functions.
- Solve Problems with continuous change in quantities.
- Determine the Limit existing, Continuous, Differentiable functions.

Learning Outcomes

On completion of the course, the student will be able to

- Explain the relationship between the function and the notion of Derivative.
- Compare and Contrast the ideas of Continuity and Differentiability.
- To solve Algebraic Equations and Inequalities.

UNIT I **15 Hour**

Functions – Shifting Graphs – Trigonometric Functions.

UNIT II **15 Hour**

Rules for Finding the Limits - Definition of Limits and its Extension – Continuity.

UNIT III **16 Hour**

The Derivative of a Function – Differentiation Rules – Rates of Change – Derivatives of Trigonometric Functions - The Chain Rule.

UNIT IV **16 Hour**

Extreme values of Functions – Mean value theorem – The first Derivative test for Local Extreme Value – Graphing with y' and y" – Limits as $x \to \pm\infty$, Asymptotes, and Dominant Terms.

UNIT V **16 Hour**

Inverse Trigonometric Functions – Derivatives of Inverse Trigonometric Functions; Integrals – Hyperbolic Functions – First Order Differential Equations.

Text Book

- Thomas Finney. (2014). *Calculus and Analytic Geometry.* Addison –Wesley. India. (13th Ed.).

Reference Book

- Tom. M. Apostol. (1966). *Calculus Volume –I.* (2nd Ed.*)*.

ALGEBRA& TRIGONOMETRY

UMAM107

Semester : I **Credits : 4**
Category : Major Core II / DSC II **Hour/Week: 6**
Class & Major : I B.Sc Mathematics **Total Hour : 78**

Objectives:
To enable the students

- Understand the Expansions of Trigonometric Functions.
- Analyse the Mathematical Series and their Usage.
- Solve Logarithmic and Exponential Equations with any Base.

Learning Outcomes
On completion of the course, the student will be able to

- Write the Expansions of Trigonometric Functions in a Clear and Logical Manner.
- Solve Problems in Summation of Series, Matrices.
- Evaluate and Demonstrate Mathematical Reasoning.

UNIT I **15 Hour**

Summation of series using Binomial - Exponential and Logarithmic Series (Theorems without Proofs) - Approximation using Binomial & Exponential Series and Logarithmic Series Simple Problems.

UNIT II **16 Hour**

Symmetric - Skew Symmetric, - Hermitian - Skew Hermitian - Orthogonal and Unitary Matrices - Cayley-Hamilton Theorem (without Proof) - Eigen Values - Eigen Vectors–Similar Matrices - Diagonalisation of a Matrix.

UNIT III **16 Hour**

Expansions of cosnθ, sinnθ - Expansion of tan nθ in terms of tan θ - Expansion of tan(A+B+C+…) - Formation of Equations.

UNIT IV **16 Hour**

Powers of sines and cosines of θ in terms of Functions of Multiples of θ - Expansions of sin θ and cos θ in a Series of Ascending Powers of θ - Expansion of Inverse Circular Functions.

UNIT V **15 Hour**

Hyperbolic Functions Definition – Relation between Hyperbolic Functions - Inverse Hyperbolic Functions.

Text Books

- Manicavachagom Pillay, T. K. Natarajan,T. and Ganapathy, K.S. (2004). *Algebra Volume I & II*. S.Viswanathan Printers & Publishers Pvt. Ltd. Chennai.
- Narayanan, S. and Manicavachagom Pillay, T.K. (2004). *Trigonometry.* S.Viswanathan Printers & Publishers Pvt. Ltd. Chennai.

Reference Books

- Kandasamy, P. Thilagavathy, K. (2004). *Mathematics for B.Sc. Vol-I, II, III & IV*. Company Ltd. New Delhi.
- Arumugam, S. (2003). *Algebra*. New Gamma Publishing House. Palayamkottai.
- Singaravel, A. (2003). *Algebra and Trigonometry Vol.-I*. Meenakshi Agency. Chennai.
- Vittal, P.R. (2004). *Trigonometry.* Margham Publications. Chennai.

MATHEMATICAL STATISTICS – I

UMAA115

Semester : I **Credit: 4**
Category : Allied **Hour/Week: 6**
Class &Major : I B.Sc Mathematics **Total Hour: 78**

Objectives

To enable the students

- Identify the basic concepts of Mathematical Statistics.
- Understand the Statistical Characteristics, Discrete and Continuous Distributions and their Properties.
- Analyse the Statistical Applications.

Learning Outcomes

On completion of the course, the student will be able to

- Acquire a Good Knowledge of various Concepts of Probability.
- Analyse the Concepts of Probability and Statistics.
- Apply Laws of Probability to Concrete Problems.

UNIT I **15 Hour**

Concept of Sample Space - Events - Definition of Probability (Classical, Statistical and Axiomatic) - Addition and Multiplication laws of Probability - Independence of Events - Conditional Probability - Baye's Theorem (Statements only)- Simple Problems.

UNIT II **16 Hour**

Random Variables (Discrete and Continuous) - Distribution Function - Expectation and Moments - Moment Generating Function - Probability Generating Function - Cumulant Generating Function - Simple Problems.

UNIT III **15 Hour**

Characteristic Function - Properties - Uniqueness and Inversion Theorem (Statement only) Chebychev's Inequality - Simple Problems

UNIT IV **16 Hour**

Concept of Bivariate Distribution - Correlation - Karl Pearson's Coefficient of Correlation - Rank Correlation - Linear Regression.

UNIT V **16 Hour**

Standard Distributions: Discrete Distributions - Binomial, Poisson, Hyper Geometric and Negative Binomial Distributions - Continuous Distributions Normal, Uniform, Exponential.

Text Book

- Gupta, S.C. & Kapoor, V.K. (2008). *Fundamentals of Mathematical Statistics*. Sultan &Sons. New Delhi.

Reference Books

- Hogg, R.V. & Craig, A.T. (1998).*Introduction to Mathematical Statistics*. Macmillan. New York.
- Mood, A.M. Graybill, F.A. & Boes, D.G. (1974). *Introduction to Theory of Statistics.* McGrawHill. New York.

VECTOR CALCULUS

UMAM207

Semester : II **Credits : 5**
Category : Major Core III / DSC **Hour/Week : 6**
Class & Major : I B.Sc Mathematics **Total Hour : 78**

Objectives:

To enable the students

- Acquire Knowledge on Applications of Definite Integrals.
- Understand the Concepts of Beta and Gamma Functions.
- Analyse the Basics of Integration and their Applications.

Learning Outcomes

On completion of the course, the student will be able to

- Acquire Knowledge of Vector Differentiation and Integration.
- Recognise Irrotational and Solenoidal Vector Fields.
- Evaluate Line and Surface Integrals.

UNIT I **14 Hour**

Vector Point Functions – Scalar Point Functions – Derivative of a Vector & Derivative of Sum of Vectors – Derivative of Product of a Scalar and Vector Point Function – The vector Operator "del" – Gradient.

UNIT II **16 Hour**

Divergence – Curl, Solenoidal, Irrotational Vectors – Laplacian Operator.

UNIT III **16 Hour**

Integration of Point Function – Line Integral – Surface Integral-Problems

UNIT IV **16 Hour**

Volume integral – Gauss Divergence Theorem (Statement Only) – Problems.

UNIT V **16 Hour**

Greens Theorem and Stoke's Theorem (Statements Only) – Problems.

Text Book

- Duraipandian, P. and Laxmi, D. (2005). *Vector Analysis* (Revised Ed.). Emerald Publishers. Chennai.

Reference Book

- Susan, J.C. (2012). *Vector Calculus*. Pearson Education. Boston. (4th Ed.).
- Anil Kumar Sharma. (1993). *Text Book of Vector Calculus*. Discovery Publishing House. New Delhi.

ANALYTICAL GEOMETRY
UMAM208

Semester : II **Credit : 5**
Category : Major Core IV / DSC IV **Hour/Week : 5**
Class & Major : I B.SC Mathematics **Total Hour : 65**

Objectives

To Enable the Students

- Identify the Fundamental aspects of Conics, Straight Lines, Sphere and Cone.
- Analyse the equations, properties of the Sphere, Cone and Cylinder.
- Apply the Geometrical Problems of Curves, Straight Lines, Cone and Sphere.

Learning Outcomes

On completion of the course, the student will be able to

- Learn Sketching of Various Curves.
- Understand the various Concepts of Analytical Solid Geometry.
- Implement Arithmetical and Geometric Operations involving Vectors in the Plane.

UNIT I **13 Hour**

General Equation of a Plane – Equation of a Plane in the Normal Form – Angle between Planes – Plane through three given Points – Equation of a Plane through the Line of Intersection of Two Planes.

UNIT II **13 Hour**

Symmetrical form of a Straight Line – Image of a Point with respect to a Plane – Image of a Line with respect to a Plane – Length and Equation of the Shortest Distance between two Skew Lines - Coplanar Lines.

UNIT III **13 Hour**

Equation of the Sphere – Length of the Tangent – Tangent Plane – Section of a Sphere by a Plane – Orthogonal Spheres – Equation of a Sphere through a given Circle.

UNIT IV **13 Hour**

Equation of a Cone with a given Vertex and a given Guiding Curve - Equation of a Cone with its Vertex at the Origin - Condition for the General Equation of the Second Degree to represent a Cone - Right Circular Cone – Enveloping Cone - Tangency of a Plane to a Cone.

UNIT V **13 Hour**

Equation of a Cylinder with a given Generator and a given Guiding Curve - Right Circular Cylinder - Enveloping Cylinder – Enveloping Cylinder as a Limiting form of an Enveloping Cone.

Text Book

- Manickavachagom Pillay, T.K. & Natarajan, T. (2004). *Analytical Geometry (Three Dimensions).* S. Viswanathan Printers & Publishers Pvt. Ltd. Chennai.

Reference Books

- Duraipandian, P. and Laxmi, D. (2010). *Analytical Geometry-2D.* Asia Publishing Company. Bombay.
- Duraipandian, P. and Laxmi, D. (2010). *Analytical Geometry-3D.* Emerald Publishers. Chennai.
- Thomas, G.B. and Finney, R.L. (2018). *Calculus and Analytic Geometry*. Addison Wesley (9th Ed.). Mass. India.

MATHEMATICAL STATISTICS II

UMAA207

Semester : II **Credit : 4**
Category : Allied - II **Hour/Week : 6**
Class &Major : I B.Sc Mathematics **Total Hour : 78**

Objectives:

To enable the students

- Classify Sampling Theory Significance Tests and Testing of Hypothesis.
- Acquire Knowledge of the usage of Correlation and Regression.
- Design and Execute Experiments.

Learning Outcomes

On completion of the course, the student will be able to

- Apply Statistics for Mathematical Problems
- Formulate a Problem in Statistical Terms and Perform Analysis of Data.
- Analyse and Apply Theoretical Results in Statistical Questions.

UNIT-I **16 Hour**

Statistical Population Census and Sampling Survey - Parameter and Statistics - Sampling and Sampling Distribution and Standard Error. Sampling Distributions - Students 't', chi - Square and F distributions.

UNIT-II **16 Hour**

Test of significance - Large Sample Test for Proportion, Mean and Standard Deviation - Exact test based on 't', Chi - square and F- distribution with respect to Population Mean, Variance and Correlation Coefficient - Tests of Independence of Attributes - Goodness of Fittests.

UNIT-III **16 Hour**

Point Estimation - Concept of Unbiasedness, Consistency, Efficiency and Sufficiency - Cramer- Rao Inequality - Methods of Estimation - Maximum Likelihood Estimation - Method of Moments.

UNIT-IV **16 Hour**

Test of Hypothesis: Null and Alternate Hypothesis - Type I and Type II error - Power of the test - Neymann Pearson lemma - Likelihood Ratio Test - Concept of Most Powerful test (Statement and Results only) - Simple Problems

UNIT-V **16 Hour**

Analysis of Variance - One - way and Two-way Classification - Basic Principles of Design of Experiments - Randomization, Replication, Local Control, Completely Randomized Design, Randomized Block Design and Latin Square Design.

Text Book

- Gupta, S.C. & Kapoor, V.K. (2008). *Fundamentals of Mathematical Statistics*. Sultan & Sons. New Delhi.

Reference Books

- Hogg, R.V. & Craig, A.T. (1998). *Introduction to Mathematical Statistics*. Macmillan. New York.
- Mood, A.M. Graybill, F.A.& Boes, D.G. (1974). *Introduction to Theory of Statistics.* McGrawHill. New York.

BUSINESS MATHEMATICS
UMAA112

Semester : I **Credit: 4**
Category : Allied **Hour/Week : 6**
Class &Major : I B.Com/B.Com(CA) **Total Hour:78**

Objectives

To enable the students

- Know the Usage of Mathematics in Business.
- Learn Computational Skills.
- Apply Analytical skills to Solve Problems.

Learning Outcomes

On completion of the course, the student will be able to

- Understand the Basics of Marketing Mathematics.
- Apply the Knowledge in Mathematics in Solving Business Problems.
- Demonstrate the Mathematical Skills in Economics and Business.

UNIT-I **15 Hour**

Basic Calculus – Rules for Differentiation – Maxima and Minima and their Applications to Business.

UNIT-II **16 Hour**

Commercial Arithmetic –Simple and Compound Interest –Annuties-Sinking Funds-Discount and Present Values of Perpetuity.

UNIT-III **16 Hour**

Simple Marketing Models-A Simple Advertising Budget Model-A Simple Inventory Model-Determination of Optimum Warehouse Torritories.

UNIT-IV **15 Hour**

Matrix – Operations on Matrices– Inverse of a Square Matrix (not more than 3rd order).

UNIT-V **16 Hour**

Solving Simultaneous Equations using Matrix Method- Integration and their Applications to Business.

Text Book

- Sundaresan, V. Jeyaseelan, S.D. (2003). *An Introduction to Business Mathematics.* S. Chand and Co. Pvt. Ltd. New Delhi.

Reference Book

- Aggarwal, B.M. (2003). *Business Mathematics and Statistics Fundamentals.* Sultan Chand and Sons Pvt. Ltd. New Delhi.

ALLIED MATHEMATICS - I

UMAA114/UMAA310

Semester	**: I**	**Credit**	**: 4**
Category	**: Allied**	**Hour/Week**	**: 6**
Class &Major	**:I B.Sc Physics**	**Total Hour**	**:78**

Objectives

To enable the students

- Know the Applications of Differential Calculus.
- Understand Higher Order Differentiation.
- Apply Numerical Techniques by solving the theory of equations.

Learning Outcomes

On completion of the course, the student will be able to

- Understand the Usage of Logarithmic Series and Exponential Series.
- Apply Methods of Functions of Complex Variables for Calculations of Integrals.
- Expand Functions in Taylor's Series.

UNIT-I **16 Hour**

Binomial Theorem for Rational Index-Exponential and Logarithmic Series – Summation and Simple Approximations related to Binomial, Exponential and Logarithmic Series.

UNIT-II **15 Hour**

Cayley Hamilton Theorem – Verification – Finding Inverse of a Matrix using Cayley Hamilton Theorem-Eigen Values and Eigen Vectors (Simple Problems only for Matrices of Order upto3 X 3).

UNIT-III **15 Hour**

Successive Differentiation-Leibentiz Theorem and its Applications– Jacobian- Concept of Polar Coordinates Radius of Curvature in Cartesian Coordinates.

UNIT-IV **16 Hour**

Complex Numbers-Applications of De-Movire's Theorem-Expansions of $\sin n\theta$, $\cos n\theta$, $\tan n\theta$,- Expansions of $\sin^n\theta$, $\cos^n\theta$-Expansion of $\sin\theta$, $\cos\theta$, $\tan\theta$ in Powers of θ.

UNIT-V **16 Hour**

Hyperbolic Functions-Inverse Hyperbolic Functions -Relation between Circular and Hyperbolic Functions-Logarithm of Complex Numbers.

Text Books

- Narayanan and Manichavaschagam Pillay. (1996). *Algebra Volume I.* Viswanathan.S (Publishers & Printers). Pvt. Ltd. Chennai.
- Narayanan and Manichavachagam Pillay. (1994). *Calculus*. Volume I. Viswanathan. S. (Publishers & Printers) Pvt. Ltd. Chennai.
- Narayanan, S. & Manicavachan Pillay, T.K. (1994). *Trignometry.* Vishwanathan.S Printers & Publishers Pvt Ltd. (9^{th} Ed.). Chennai.

Reference Book

- Kandasamy, P. Thilagavathy, K. *(*2012). *Allied Mathematics.* S. Chand. (Publishers & Printers). Pvt. Ltd. Chennai.

MATHEMATICAL METHODS – I

UMAA110

Semester : I **Credit : 4**
Category : Allied **Hour/Week : 6**
Class & Major: I BCA **Total Hour : 78**

Objectives:
To enable the students

- Know the Basic Concepts of Set Theory and Relations.
- Express themselves to the Fundamentals of Differentiation.
- Apply Binary Operators in Automation.

Learning Outcomes
On completion of the course, the student will be able to

- Understand the Relations between Sets and their Property.
- Draw and Interpret Venn Diagrams of Set Relations and Operations.
- Apply set Theory to Solve Real Life Problems.

UNIT-I **16 Hour**

Proposition- Logical operators- Conjunction- Disjunction- Negation- Conditional and Bi-Conditional Operators- Converse- Inverse- Contra Positive- Logically Equivalent- Tautology and Contradiction-Arguments and Validity of Arguments.

UNIT-II **10 Hour**

Sets- Set Operations- Venn Diagram- Properties of Sets- Number of Elements in a Set Cartesian Product.

UNIT-III **16 Hour**

Equivalence Relation- Equivalence Class- Partially and Totally Ordered sets- Functions- Types of Functions- Composition of Functions.

UNIT-IV **16 Hour**

Types of Binary Operations- Commutative- Associative- Distributive and Identity Boolean Algebra- Simple Properties - Finite State Machine.

UNIT-V **20 Hour**

Derivation-Differential Coefficient of a Sum (or Difference) – Product Rule-Quotient Rule Successive Differentiation- Partial Differentiation- Applications of Differentiation- Tangent and Norma- Angle between Two Curves- Maximum and Minimum Values[Second Derivatives Test].

Text Books

- Venkataraman, M.K, (2003). *Discrete Mathematics*. National Publishing Company. Chennai.
- Narayanan, S. & Manicavacham Pillay, T.K. (2003). *Differential Calculus Volume I*. Viswanathan. S. (Publishers and Printers). Pvt. Ltd. Chennai.

Reference Books

- Balaji, G. (2006). *Discrete Mathematics.* G.Balaji Publishers. Chennai.
- Kandasamy, P. Thilagavathi, K. Gunavathi, K. (2003). *Engineering Mathematics-I*. S. Chand & Company Ltd. Chennai.

STATISTICAL METHODS

UMAA113

Semester : I **Credit : 4**
Category : Allied **Hour/Week : 5T+1P**
Class &Major :I BCA **Total Hour : 78**

Objectives:

To enable the Students

- Acquire Knowledge of the Distributions of Univariate and Bivariate.
- Understand the Significance of Statistical techniques.
- Apply Statistical Techniques for analyzing, and Interpreting Numerical data.

Learning Outcomes

On completion of the course, the student will be able to

- Understand Key terminology, Concepts Tools and Techniques used in Business Statistical Analysis.
- Analyse the Issues Surrounding Sampling and Significance.
- Analyse the Underlying Assumptions of Analysis Tools.

UNIT – I **(12+2) Hour**

Diagrammatic and Graphical Representation of StatisticalData-Significance of Diagrams and Graphs-Types of Diagrams-One Dimensional Diagrams, Two Dimensional Diagrams– Pictograms and Cartograms. Graphs of Frequency Distribution-Histogram, Frequency Polygon, Frequency Curve-Ogive Curves.

UNIT - II **(13+3) Hour**

Measures of Central Tendency-Requisites of a Good Average-Types of Average-Arithmetic Mean, Median, Mode, Geometric Mean, Harmonic Mean and their Merits and Demerits-Graphical determination of Median, Quartiles, Deciles, Percentiles and Mode.

UNIT - III **(13+3) Hour**

Measures of Dispersion-Range, Quartile deviation, Mean deviation, Standard deviation, and their Relative Measures, Combined Standard Deviation, Coefficient of Variation-Merits and Demerits of these Methods-Lorenz curve. Skewness-Measures of Skewness-Karl Pearson's Coefficient of Skewness - Bowley's Coefficient of Skewness, Kelly's Co-efficient of Skewness-Moments-Measures of Skewness based on Moments and Measure of Kurtosis.

UNIT - IV **(15+3) Hour**

Correlation Analysis-Significance or the Study of Correlation- Types of Correlation-Methods Studying Correlation-Scatter Diagram Method, Graphical Methods, Karl Pearson's co-Efficient of Correlation, Spearman's Rank Correlation Coefficient, Concurrent Deviation Method-Properties of Coefficient of Correlation.

UNIT - V **(12+2) Hour**

Regression Analysis-Uses of Regression Analysis-Regression Lines-Regression Equations-Properties of Regression Coefficient.

Practical

- Presentation of Data-Diagrams &Graphs.
- Calculation of Measures of Central Tendency-Mean, Median, Mode, Geometric Mean, Harmonic Mean.
- Calculation of Measures of Dispersion-Range, Quartile deviation, Mean Deviation,

- Standard Deviation and its relative Measures and Skewness
- Karl Pearson's Correlation Coefficient.
- Regression equation of X on Y &Y on X.

Text Book

- Gupta, S.P. (2011). *Statistical Methods.* Sultan Chand and Sons. Chennai.

Reference Books

- Gupta, S.C. and Kapoor, V.K. (2006). *Elements of Mathematical Statistics*. Sultan Chand and Sons. Chennai.
- Snedecor, G.W. and Cochran W.G. (1967). *Statistical Methods*. Oxford Press and IBH. Chennai.

MATHEMATICS FOR COMPUTER SCIENCE

UMAA218

Semester : II **Credit : 4**
Category : Allied **Hour/Week : 6**
Class & Major : I B.SC Computer science **Total Hour : 78**

Objectives

To enable the Students

- Acquire Knowledge in Mathematics.
- Understand the Techniques of Various Branches of Mathematics.
- Apply the Mathematical Techniques in their Respective Subjects.

Learning Outcomes

On completion of the course, the student will be able to

- Understand the Core Branches of Mathematics.
- Apply Knowledge of Computing and Mathematics Appropriate to the Discipline.
- Analyse and Define the Computing Requirements Appropriate to its Problem.

UNIT-I **15 Hour**

Binomial Series – Statement of Binomial Theorem for any Index – A Few Important Expansions – Application of the Binomial Theorem to the Summation of Series. Exponential Series – Summationof Seriesusing Exponential Series – LogarithamicSeries.

UNIT-II **16 Hour**

Higher Derivative – n^{th}Derivative – Formation of Equation Involving Derivative– Leibnitz Formula for the n^{th}Derivative of a Product (statement only). Radius of curvature (Cartesian Formula only) Jacobian.

UNIT-III **15 Hour**

Expansion of Cos nθ and Sin nθ- Powers of sines and cosines of θ in terms of Function of Multiple of θ - Expansion of $\cos^n\theta$ when n is the Positive Integer – Expansion of $\sin^n\theta$ when Positive Integer- Logarithm of Complex Number.

UNIT-IV **16 Hour**

Definite Integral – Properties of Definite Integrals – Integration by Parts using Bernouli's formula – Double Integral.

UNIT-V **16 Hour**

Definition – Inverse Laplace transform – Solving Second Order Differential Equations using Laplace Transform.

Text Books

- Narayanan, S. Hanumantha Rao, R.Manicavachagom Pillay.(2008). *Ancillary Mathematics Volume –I.* S. Viswanathan (Printers & Publishers) Pvt.Ltd. Chennai.
- Narayanan, S. Hanumantha Rao, R. Manicavachagom Pillay. (2008). *Ancillary Mathematics Volume –II.* S. Viswanathan (Printers & Publishers) Pvt. Ltd. Chennai.

Reference Books

- Narayanan, S. Manickavachagom Pillay, T.K. (1996). *Algebra Volume I.* Vishwanathan. S. (Printers & Publishers). Pvt Ltd. Chennai.
- Narayanan, S. Manickavachagom Pillay, T.K. (1994). *Calculus Volume I.* Vishwanathan. S (Printers & Publishers). Pvt Ltd. Chennai.
- Narayanan, S. Manickavachagom Pillay, T.K. (1994). *Trigonometry.* (9thEd.). Vishwanathan. S. (Printers & Publishers). Pvt Ltd. Chennai.

MATHEMATICAL METHODS – II

UMAA216

Semester : II **Credit : 4**
Category : Allied **Hour / Week : 6**
Class &Major :I BCA **Total Hour : 78**

Objectives

To enable the students

- Understand the Basic Concepts of Matrices.
- Explore the Fundamentals of Integration.
- Apply the Technique of Differentiation in Vectors.

Learning Outcomes

On completion of the course, the student will be able to

- Determine Gradient Vector Fields and Find Potential Functions.
- Evaluate Line Integrals Directly and by the Fundamental Theorem.
- Solve Problems in Mathematical Applications using the Integral.

UNIT-I **13 Hour**

Multiplication of Matrices- Singular and Non-Singular Matrices- Adjoint of a Matrix- Inverse of a Matrix Symmetric and Skew –Symmetric-Hermitian and Skew - Hermitian- Orthogonal and Unitary matrices-Rank of a matrix.

UNIT-II **15 Hour**

Solution of Simultaneous Linear equations by Matrix Inversion Method- Test for Consistency and Inconsistency of Linear equations(Rank Method) Characteristic Roots and Characteristic Vectors-Cayley – Hamilton Theorem.

UNIT-III **15 Hour**

Integration by Substitution- Integration of rational and Irrational Function of the Form

$$\frac{1}{ax^2+bx+c}, \frac{1}{\sqrt{ax^2+bx+c}}, \sqrt{ax^2+bx+c}, \frac{px+q}{ax^2+bx+c}, \frac{px+q}{\sqrt{ax^2+bx+c}}.$$

UNIT-IV **17 Hour**

Definition and Properties of Definite Integrals- Reduction formulae for

$$\int x^n e^{ax}dx, \int \sin^n x dx, \int \cos^n x dx, \int x^m (1-x)^n dx,$$

z

UNIT-V **18 Hour**

Vector Functions-Derivatives of Vectors-Gradient-Divergence and Curl, Properties of Curl, Properties of a Gradient Functions-Directional Derivative-Solenoidal and Irrotationals.

Text Book

- Manicavachagom Pillay. Natarajan, Ganapathy. (2003). *Vector Analysis.* S.Viswanathan Printers and Publishers Pvt**.** Ltd**.** Chennai.

Reference Book

- Duraipandian, P. Dr. Udayabaskaran, S. (1997). *Allied Mathematics – Volume I.* Muhil Publishers. Chennai.

ALLIED MATHEMATICS -II

UMAA222

Semester : II **Credit : 4**
Category : Allied **Hour/Week : 6**
Class &Major : I B.Sc Physics **Total Hour : 78**

Objectives

To enable the students

- Acquire Knowledge in Mathematics.
- Analyse the Sequence and Series of a Function.
- Apply the Techniques of Various Branches of Mathematics.

Learning Outcomes

On completion of the course, the student will be able to

- Use Integrals in Various Fields.
- Analyze the Computing Requirements Appropriate to its Solution.
- Apply Knowledge of Computing and Mathematics Appropriate to the Discipline.

UNIT-I **15 Hour**

Standard Integrals-Properties of Definite Integrals.

UNIT-II **16 Hour**

Integration by Parts – Double Integrals – Applications of Double Integrals to Find Areas.

UNIT-III **16 Hour**

Sequence and Series- Functions of a Complex Variable- Analytic Functions- Cauchy Riemanns Equations- Harmonic Functions- Construction of Analytic Functions.

UNIT-IV **16 Hour**

Laplace Transform of Functions – Inverse Laplace Transforms – Application of Laplace Transforms in Solving Differential Equations.

UNIT-V **15 Hour**

Formation of Partial Differential Equation – Second Order Differential Equations with Constant Co-efficients –Homogeneous Linear Differential Equations of the Second Order with Variable Co-efficients.

Text Books

- Manicavachagom Pillai, T.K. (2010). *Ancillary Mathematics Integral Calculus*. Viswanathan.S Publishers & Printers Pvt. Ltd. Chennai.
- Narayanan, S. Manicavachagom Pillay, T.K. (1994). *Complex Analysis,*Vishwanathan. S Printers & Publishers. Pvt. Ltd. Chennai.

STATISTICS USING EXCEL

UMAR201

Semester : II **Credit : 2**
Category : Non Major Elective **Hour/Week : 3**
Class &Major : I UG **Total Hour : 39**

Objectives:

To enable the students

- Understand the Basic Concepts of Collection, Classification and Tabulation of Data.
- Summarize and Visualize result of Data Analysis in Spreadsheets.
- Represent the various Measures using MS Excel.

Learning Outcomes

On completion of the course, the student will be able to

- Use Excel Functions to Summarize Quantitative Data Graphically
- Perform Basic Operations and Formatting.
- Implement Different Formulae and Functions in Spreadsheets.

List of Practicals:

1. Entering Data, Labels and Values.
2. Presentation of Data – Diagrams and Graphs.
3. Measures of Location and Dispersion (absolute and relative).
4. Computation of Correlation Coefficient for Raw and Grouped Data.
5. Rank Correlation Coefficient.
6. Computation of Regression Equations for Raw Data.
7. Computation of Regression Equations for Grouped Data.
8. Curve Fitting by the Method of Least Squares a. $y=ax+b$ b. $y=ax^2+bx+c$ c. $y=ae^{bx}$ d. $y=ax.b$
9. Fitting of Binomial, Poisson, Normal Distributions and Tests of Goodness of Fit.
10. Large Sample Tests with regard to Population Mean, Proportion, Standard Deviation.
11. Exact Tests with Respect to Mean, Variance and Coefficient of Correlation.
12. Test for Independence of Attributes Based on Chi-Square Distribution.

Reference Books

- Vittal, P.R. (2016). *Mathematical Statistics.* Margham Publications. India.
- Gupta, S.P. (2011). *Statistical Methods*. Sultan Chand & Sons Publications. India.

E-LEARNING RESOURCES:

- http://www.mathforum.org
- http://www.opensource.org
- http://www.khanacademy.org
- http://in.ixl.com
- http://www.learningwave.

BASIC MATHEMATICS FOR SCIENCE

UMAE204

Semester : II **Credit : 2**
Category : Non Major Elective **Hour/ Week : 3**
Class &Major : I UG **Total Hour : 39**

Objectives

To enable the students

- Understand the Basic Concepts of Matrices and Trigonometry.
- Explore the Concepts of Fundamentals of Differentiation and Integration.
- Apply the Appropriate Methods to Solve the Problems.

Learning Outcomes

On completion of the course, the student will be able to

- Develop and Maintain Problem-Solving Skills.
- Use Mathematical Ideas to model Real-World Problems.
- Understand the Foundations of Mathematics.

UNIT-I **8 Hour**

Multiplication of Matrices-Singular and Non-Singular matrices-Adjoint of a Matrices-Inverse of a Matrices-Symmetric and Skew Symmetric-Hermitian and Skew Hermitian-Orthogonal and Unitary Rank of a Matrix.

UNIT-II **9 Hour**

Solution of Simultaneous Linear Equations by Matrix Inversion Method-Test for Consistency and Inconsistency of Linear Equations(Rank Method).

UNIT-III **8 Hour**

Derivation-Differential Coefficient of a sum (or difference)-Product Rule-Quotient Rule, Function of Function Rule.

UNIT-IV **7 Hour**

Definition-Standard Formulae.

UNIT-V **7 Hour**

Integration by Parts - Simple Problems.

Text Books

- Narayanan, S. Manicavachagom, Pillay. & Natarajan, Ganapathy. (1991). *Vector Analysis.* Vishwanathan.S Printers & Publishers Pvt. Ltd. Chennai.
- Kandhasami, Thilagavathy. (2004). *Allied Mathematics Volume-II.* S.Chand & Co Pvt. Ltd. New Delhi.
- Dr.Venkatraman. M.K. ManoramaSridhar. (2005).*Allied Mathematics.* Agasthiar Publications Pvt. Ltd. Trichy.

MATHEMATICS FOR BUSINESS AND DECISION MAKING

UMAE202

Semester : II **Credit : 2**
Category : Non Major Elective **Hour/Week : 3**
Class &Major : I UG **Total Hour : 39**

Objectives

To enable the students

- Acquire Knowledge on the Scientific Methods for obtaining Optimal Solution.
- Understand the Basic concepts of Mathematics and their Application in Business.
- Analyze a Problem and Apply it to Real Life Problems with Effective Application.

Learning Outcomes

On completion of the course, the student will be able to

- Understand the Basics of Marketing Mathematics by Solving relevant Problems.
- Apply the Principles of Simple / Compound Interest to Solve relevant Problems in Financial Applications.
- Execute Maximin or Minimax Criterion –Savage Criterion – Hurwitz Criterion in Decision Making.

UNIT-I **8 Hour**

Set and set operation – Venn diagrams- Elements of Co-ordinate systems – Slope intercept form of equation of the Straight Line.

UNIT-II **9 Hour**

Matrices; Fundamental Ideas about Matrices and their Operational Rules – Matrix Multiplication – Inverse of Square Matrices of not more than 3 ×3 Order-Basic of Calculus-Rules of Differentiation – Integration and their Applications to Business.

UNIT-III **8 Hour**

Simple and Compound Interest – Annuities – Sinking Funds – Discounts and Present Values.

UNIT-IV **7 Hour**

Introduction – Decision Making Environment –Maximin or Minimax Criterion –Savage Criterion –Hurwitz Criterion.

UNIT-V **7 Hour**

Pure Strategy (Saddle point) – Dominance Property – Mixed Strategies (2×2 Games,2×n Games or m×2 Games, 3×3 Games) – Two-Person Zero Sum Games.

Text Books

- Gupta, P.K. Hira, D.S. *Operations Research.* S. Chand & Company Ltd. New Delhi.
- Kanthi Swarup, P. K. Gupta, Manmohan. (2006). *Operation Research*, S. Chand & Co. Pvt Ltd. New Delhi.
- Sundharesan. and Jayaseelan. (2003). *An Introduction to Business Mathematics.* S. Chand and Co Pvt. Ltd. New Delhi.

NUMERICAL METHODS USING C++

UMAE206/UMAE302

Semester	**: II**	**Credit**	**: 2**
Category	**: NME**	**Hour/Week**	**: 3**
Class &Major	**: II UG**	**Total Hour**	**: 39**

Objectives

To enable the students

- Acquire Knowledge on C++.
- Understand the Various Tools in Solving Numerical Problems.
- Apply the Methods to Solve Problems using the Language.

Learning Outcomes

On completion of the course, the student will be able to

- Select and Apply the Appropriate Numerical Method for a variety of Common Problems.
- Develop Specialized Computer Programs to Solve Engineering Problems.
- Validate and Document Numerical Solutions.

UNIT-I **9 Hour**

Variables-Input and Output—If Statement-Logical Operators-Nested If and Switch Statements – For Statement – While statement –Arrays – Pointers – Library Functions – User Defined Function.

UNIT-II **8 Hour**

Gauss – Elimination method – Pivoting – Gauss –Jordan Elimination method – Gauss – Seidal Iteration method

UNIT-III **8 Hour**

Bisection Method – Newton's Method – Interpolation – Newton's Divided Difference Formula – Lagrange's Interpolation – Newton's Forward and Backward Difference Formula. (Application of C++ Programming is included for Units III & IV).

UNIT-IV **7 Hour**

Numerical Differentiation – Numerical Integration – Newton's Cotes Method – Trapezoidal Rule – Simpson's Rule.

UNIT-V **7 Hour**

Initial Value Problem – Euler's Method – Runge – Kutta Method – Boundary Value Problem.

Text Books

- James, M. Ortega. Andrew, S. Grimshaw. (1999). *An Introduction to C++ and Numerical Method.* Oxford University Press. New York.
- Jain, M.K. Iyengar S.R.K. and Jain, R.K. (1999). *Numerical Methods for Scientific and Engineering Computation.* Wiley Eastern Ltd. New Delhi.

Reference Books

- Balagurusamy, E. (1996). *Object Oriented Programming with C++.* Tata McGraw Hill Publishing Company Ltd. New Delhi.
- Froberg, C.E. (1972). *Introduction to Numerical Analysis.* Addison-Wesely Publishing Company. India.

OPERATIONS RESEARCH FOR MANAGERS

UMAE207/UMAE 402/UMAE306

Semester: IV **Credit : 2**
Category: NME **Hour/Week : 3**
Class &Major : II UG **Total Hour : 39**

Objectives

To enable the students

- Understand the Various Techniques of Research.
- Analyse the Various Applications in Management Techniques.
- Solve Real Life Problems in Business and Management.

Learning Outcomes

On completion of the course, the student will be able to

- Understand the Input–Process and Output Framework.
- Examine the types of Transformation Processes Occurring within Operations.
- Analyse the Roles and Responsibilities of Operations Managers and the Challenges they Face.

UNIT-I **7 Hour**

Mathematical Formulation of the Problem- Graphical Solution Method- General Linear Programming Problem- The Computational Procedure- Simple Problems.

UNIT-II **9 Hour**

General Transportation Problem-The Transportation Table-Loops in Transportation Tables-Solution of a Transportation Problem-Finding an Initial Basic Feasible Solution-Test for Optimality-Degeneracy in Transportation Problem-Transportation Algorithm (MODI Method). Simple Problems.

UNIT-III **8 Hour**

Mathematical Formulation of the Problem- the Assignment method- Special Cases in Assignment Problem. Simple Problems.

UNIT-IV **8 Hour**

Two-Person Zero-Sum Games- Some Basic Terms- The Maximin- Minimax Principle- Games Without Saddle Points-Mixed Strategies- Graphic Solution of 2x n and m x 2 Games- Dominance Property. Simple Problems.

UNIT-V **7 Hour**

Network and Basic Components- Logical Sequencing- Rules of Network Construction-Critical Path Analysis- Simple problems.

Text Book

- Kanti, Swaroop, Gupta, P.K. and Manmohan. (2003). *Operation Research*. Sultan Chand & Sons. New Delhi.

Reference Books

- Kapoor, V.K. (1996). *Introduction to Operation Research*. Sultan Chand & Sons.
- Sharma, S.D. (1995) *Operation Research*. Kedar Nath Ram Nath & Co.
- Taha, A. Hamdy. (2000). *Operation Research-An Introduction*. Prentice Hall of India Pvt Ltd. (6thEd.). New Delhi.

STATISTICAL DATA ANALYSIS THROUGH SPSS

UMAE208/UMAA501/UMAE 305

Semester : III **Credit : 2**
Category : NME **Hour/Week : 2T+1P**
Class &Major : II UG **Total Hour : 39**

Objectives

To enable the students

- Understand the Techniques of Statistical Data Analysis.
- Analyse Data using Various Statistical Techniques to Evaluate Research Results through SPSS.
- Implement the Concept of Test Reliability in Correlation.

Learning Outcomes

On completion of the course, the student will be able to

- Understand How to Enter and Reorganize Information within SPSS
- Understand How to Effectively Summarize Research Finds using SPSS through the Use of Appropriate Indexes and Tables.
- Understand the Basic Principles Behind Inferential Statistics.

UNIT-I **(5+2) Hour**

Essential Terminology for all SPSS Users – Getting to SPSS for Windows – the Components of Window – SPSS for Windows Screens – Crucial Preliminaries – Entering Data into SPSS – Editing Data – Saving Data File – Retrieving Data File.

UNIT-II **(7+2) Hour**

Merging Data Files – Adding Scores to Existing Cases – Add Variables – Running a Simple Analysis and Obtaining the Output.

UNIT-III **(4+3) Hour**

Checking the Data – BoxPlots of Score Distributions – Listing of the Data using Case Summarizes – Graphs – Bar, Line, Pie Chart, Scatter Plots and Histograms.

UNIT-IV **(4+3) Hour**

Frequency Distributions– Measures of Frequency Distributions – Cross Tabulations – Obtaining Two Sample Chi-Square Tests – Log Linear Analysis – Parametric Statistical Tests – Comparing Means – Paired and Unpaired t-Test.

UNIT-V **(6+3) Hour**

Correlation and Multiple Regression – Analyzing Nominal and Ordinal Data – Nonparametric Analysis – Wilcoxon, Mann-Whitney and Kruskal Wallis Tests – the Concept of Test Reliability – Assessing Test Reliability.

Text Book

- Rajathi, A. and Chandran, P. (2010). *SPSS for You*. MJP Publishers.

Reference Books

- Clifford, E. Lunenburg. (2000). *Data Analysis by Resampling: Concepts and Applications.*
- Dusbury Thomson Learning. Australia.
- Everitt, B.S. and Dunn, G. *Applied Multivariate Data Analysis*. Amold London. (2001).
- Jeremy, J. Foster.(2001).*Data Analysis using SPSS for Windows*. New Edition Version 8-10. Sage publications. London.

PRACTICALS

- Entering Data, Labels, Values.
- Presentation of Data – Diagrams & Graphs.
- Measures of location.
- Measures of Dispersion.
- Karl Pearson's Correlation Coefficient.
- Spearman's Rank Correlation.
- Regression Equation of X on Y.
- Regression Equation of Y on X.
- Cross Tabulation.
- Test for Single Mean.
- Test for Difference between Two Sample Means – Independent Samples.
- Test for Difference between Two Sample Means – Dependent Samples.
- Test for Difference between Two Sample Variances.

Non-parametric Test

- Chi- Square Test of Goodness of Fit.
- Chi-Square Test for Independence of Attributes.

APPLIED MATHEMATICS

UMAE209/UMAE309

Semester : III **Credit : 2**
Category : NME **Hour/Week : 3**
Class & Major : II UG **Total Hour : 39**

Objectives:

To enable the Students

- Understand the Properties of Matrix, Partial Differential Equations and Graphs.
- Apply the Concept of Linear Algebra and Graph Theory for Scientific Computing.
- Analyze Numerical Problems in Science Applications.

Learning Outcomes

On completion of the course, the student will be able to

- Understand Mathematical Ideas Easily in Writing with Precision, Clarity and Organization by using Proper Terminology.
- Apply Numerical Techniques in Solving Problems.
- Acquire Proficiency in the Use of Technology in Learning and Investigating Mathematical Ideas by using Problem-Solving Skills.

UNIT - I LINEAR ALGEBRA **10 Hour**

Linear System of Equations – Gauss Elimination - Rank of Matrix – Inverse of a Matrix Gauss Jordan Elimination- Applications.

UNIT - II LINEAR ALGEBRA (CONTD.) **10 Hour**

The Matrix Eigen Value Problem – Eigen Value and Eigen Vectors- some Applications of Eigen Value Problems.

UNIT- III NUMERICAL APPLICATIONS **10 Hour**

Solution of Equations by Iterations – Newton Rapson Method- Interpolation –Lagrange's Interpolation – Spline Interpolation.

UNIT – IV MEASURE THE RATE OF RETURN OF AN INVESTMENT 10 Hour

Basic Concepts of PDE –Modeling – Wave Equation –Heat Equation -Applications.

UNIT – V APPLICATIONS OF GRAPHS 12 Hour

Graphs and Digraphs- Computer representation of Graphs – Shortest Paths Problems-Spanning Tree-Applications.

Text Books

- Erwin, Kreyszig. (2016). *Advanced Engineering Mathematics.* Wiley Publications. Tenth Edition.

Reference Books

- Grewal, B.S. (2015). *Higher Engineering Mathematics.* Khanna Publications. (43rd Ed.).

III & IV EVALUATION COMPONENTS OF CIA

Semester	Category	Course code	Course Title	Component III	Component IV
I	Major Core I / DSC I	UMAM104	Differential Calculus	Assignment	Poster Presentation
	Major Core II / DSC II	UMAM107	Analytical Geometry	Assignment	Poster Presentation
	Allied I	UMAA115	Mathematical Statistics - I	Assignment	Problem Solving
II	Major Core III / DSC III	UMAM207	Vector calculus	Assignment	Seminar
	Major Core IV / DSC IV	UMAM208	Algebra and trigonometry	Assignment	Problem Solving
	Allied II	UMAA207	Mathematical Statistics - II	Assignment	Problem Solving
	Non Major Elective	UMAE210	Statistics Using Excel	Assignment	Project

III & IV EVALUATION COMPONENTS OF CIA-ALLIED

Semester	Category	Course code	Course Title	Component III	Component IV
I	ALLIED	UMAA112	Business Mathematics	Assignment	Seminar
		UMAA114 / UMAA310	Allied Mathematics -I	Assignment	Seminar
		UMAA110	Mathematical Methods I	Assignment	Problem Solving
		UMAA113	Statistical Methods	Assignment	Seminar
II		UMAA218	Mathematics for computer Science	Assignment	Seminar
		UMAA216	Mathematical Methods II	Assignment	Problem Solving
		UMAA222	Allied Mathematics -II	Assignment	Seminar

III & IV EVALUATION COMPONENTS OF CIA-NME

Semester	Category	Course code	Course Title	Component III	Component IV
II	Non Major Elective	UMAR201	Statistics using Excel	Term Paper	Project
		UMAE204	Basic Mathematics for Science	Assignment	Problem Solving
		UMAE202	Mathematics for Business and Decision Making	Assignment	Problem Solving dc
		UIDE302/ UMAE302/ UMAE206	Numerical Methods using C++	Assignment	Assignment
		UMAE207	Operation Research For Managers	Assignment	Assignment
		UMAA501/ UMAE305 UMAE208	Statistical Data Analysis through SPSS	Assignment	Assignment
		UMAE309/ UMAE209	Applied Mathematics	Assignment	Assignment

PROGRAMME PROFILE M.Sc. (Mathematics)

PREAMBLE

PG :Programme Profile, list of Courses offered to the other Departments and the Syllabi of Courses offered in the I and II Semesters (With Effect From 2021-2023 Batch onwards)

PSO 1 : Understanding of Advanced Concepts, Principles and Techniques from Pure & Applied Topics in Mathematics and Application of Problem-Solving Skills.

PSO 2 : Development of Abstract Mathematical Thinking and Mathematical Intuition.

PSO 3 : Assimilation and Communication of detailed Technical Arguments.

PSO4 : Proficiently to Construct and Formulate Logical Arguments, Conjectures and Construction of Rigorous Proof by Abstracting Principles.

PSO 5 : Ability to carry out extended Investigation of Mathematical Work as various Projects Independently.

Semester	Category	Course Code	Course Title	Previous course code	Contact Hrs/ Week	Credit Min/ Max
I	Major Core I / DSC I	PMAM108	Abstract Algebra	PMAM107	6	4
	Major Core II/ DSC II	PMAM102	Real Analysis	-	6	4
	Major Core III / DSC III	PMAM103	Ordinary Differential Equations	-	6	4
	Major Core IV / DSC IV	PMAM105	Calculus Of Variations And Integral Equations	-	6	4
	Major Core V / DSC V	PMAM106/ PMAM407	Fuzzy Analysis	-	6	4
				TOTAL	**30**	**20**
II	Major Core VI/ DSC VI	PMAM210	Linear Algebra	PMAM209	5	4
	Major Core VII / DSC VII	PMAM202	Measure and Integration	-	5	4
	Major Core VIII / DSC VIII	PMAM206	Partial Differential Equations	-	5	4
	Major Core IX / DSC IX	PMAM207	Classical Mechanics	-	5	4
	Major Core X / DSC X	PMAM208	Operations Research	-	5	4
	Non Major Elective			-	5	4
	Service Learning	PMAX201/ PMAX202	Mathematics for High School Students \Elementary Mathematics for Higher Secondary Students	-	-	1
	Online Course	PMAS201	Spoken Tutorial /NPTEL	-	-	- /2
				TOTAL	**30**	**25 / 27**
III	Major Core XI / DSC XI	PMAM305	Complex Analysis	-	6	4
	Major Core XII / DSC XII	PMAM310	Fluid Dynamics	-	6	4
	Major Core XIII / DSC XIII	PMAM311	Topology	PMAM314	6	4
	Major Core XIV / DSC XIV	PRMC301	Research Methodology	-	5	4
	Major Core XV/DSC XV	PMAI312	Number Theory and Cryptography	-	5	4
	Major Core XVI/ DSC XVI	PMAP401	Project	-	2	-
				TOTAL	**30**	**20**
IV	Major Core XVII / DSC XVII	PMAM405	Functional Analysis	-	6	5
	Major Core XVIII / DSC XVIII	PMAM410	Probability theory	-	6	5
	Major Core XIX / DSC XIX	PMAM409	Numerical Analysis	-	7	5
	Major Core XX / DSC XX	PMAM403	Differential Geometry	-	6	5
	Major Core XXI / DSC XXI	PMAP401	Project	-	4	5
			Library		1	-
				TOTAL	**30**	**25**
				GRAND TOTAL	**120**	**90/ 92**

PROGRAMMES OFFERED TO OTHER DEPARTMENTS – PG

Semester	Category	Course Code	Course Title	Contact Hrs/ Week	Credit Min/ Max
I	Non Major Elective	PMAE101	LaTeX and MaTLab	3	4
	Practical		LaTeX and MaTLab	2	
	Non Major Elective	PMAE102	Operations Research	5	4
II	Non Major Elective	PMAE202	NET/SET/ Competitive Exam	5	4
		PMAE203	Discrete mathematics	5	4

EXTRA CREDIT EARNING PROVISION

Semester	Category	Course code	Course Title	Hrs/ Week	Credit Min /Max
III	Self-Study Paper	PMAS301/	Difference Equation	2	-/1
		PMAS302	Combinatorial Analysis	2	-/1

ABSTRACT ALGEBRA
PMAM108

Semester : I **Credit : 4**
Category : Core I **Hour/Week : 6**
Class &Major : I M.Sc Mathematics **Total Hour : 78**

Objectives
To enable the students

- Understand Computational Skills in Abstract Algebra.
- Analyze the Basics of Algebraic Structures.
- Execute Working Knowledge on Galois.

Learning Outcomes
On completion of the course, the student will be able to

- Understand the Connection and Transition of Advanced Mathematics.
- Acquire Important Mathematical Concepts in Abstract Algebra.
- Solve Problems using Algebraic Techniques.

UNIT-I **16 Hour**

Another Counting Principle- Class Equation for Finite Groups and its Applications- Sylow's Theorem- Direct Products-Finite Abelian Groups.

UNIT-II **15 Hour**

Dual Spaces - Inner Product Space - Modules.

UNIT-III **20 Hour**

Extension Fields – Transcendence of e-Roots of Polynomials.

UNIT-IV **15 Hour**

Trace and Transpose – Determinants, Hermitian, Unitary, Normal Transformations.

UNIT-V **12 Hour**

Elements of Galois Theory - Finite Fields – Wedderburn's Theorem on Finite Division Rings.

Text Book

- Herstein, N. (2000). *Topics in Algebra.* Wiley Eastern Limited. New Delhi.

Reference Books

- Bhattacharya, P.B. Jain, S.K. & Nagpaul, S.R. (1997). *Basic Abstract Algebra*. Cambridge University Press. New York.
- Malik, D.S. Mordeson,J.N. & Sen, M.K. (1997). *Fundamental of Abstract Algebra.* McGraw Hill. New York.
- Artin, M. (1991). *Algebra.* Prentice Hall of India. New Delhi.

REAL ANALYSIS

PMAM102

Semester : I **Credit: 4**
Category : Core II **Hour/Week: 6**
Class &Major : I M.SC Mathematics **Total Hour:78**

Objectives

To enable the students

- Understand the Functions of Bounded Variation, Riemann- Stieltjes Integration, Convergence and its Variations.
- Apply the Convergence of Sequence of Functions in Real Life Situations.

Learning Outcomes

On completion of the course, the student will be able to

- Understand the Theory of Sequences and Series, Continuity, Differentiation and Integration.
- Describe the Fundamental Properties of the Real Numbers.
- Apply Analytical Skills in Constructing Rigorous Mathematical Arguments.

UNIT-I **16 Hour**

Double Sequences – Double Series – Rearrangement Theorem for Double Series- A Sufficient Condition for Equality of Iterated Series – Multiplication of Series – CesaroSummability– Infinite Products. Power Series – Multiplication of Power Series – The Taylor's Series Generated by a Function – Bernstein's Theorem - Able'sLimit Theorem– Tauber's Theorem.

UNIT-II **16 Hour**

Point Wise Convergence of Sequences of Functions – Examples of Sequences of Real Valued Functions – Definitions of Uniform Convergence – Uniform Convergence and Continuity _ The Cauchy Condition for Uniform Convergence – Uniform Convergence of Infinite Seriesof Functions– Uniform Convergence and Riemann– Stieltjes integration – Non Uniform Convergence and Term -by- Term Integration – Uniform Convergence Differentiation – Sufficient Condition for Uniform Convergence of a Series – Mean Convergence.

UNIT-III **16 Hour**

Introduction – Orthogonal system of functions – the theorem on best approximation – The Fourier Series of a Function Relative to an Orthonormal System – Properties of Fourier

Coefficients – The Riesz-Fischer Theorem – The Convergence and Representation Problem in Trigonometric Series – The Riemann – Lebesgue Lemma – The Dirichlet Integrals – An Integral Representation for the Partial Sums of Fourier Series – Riemann's Localization Theorem – Sufficient Condition for Convergence of a Fourier Series – Consequence of FejesTheorem – The Weierstrass Approximation Theorem.

UNIT-IV **15 Hour**

Introduction – The Directional Derivative – Directional Derivative and Continuity – The Total Derivative - The total Derivative Expressed in Terms of Partial Derivatives – The Matrix of Linear Function – The Jacobian Matrix – The Chain Rule – Matrix form of Chain Rule – The Mean – Value Theorem for Differentiable Functions – A Sufficient Condition for Differentiability Condition for Equality of Mixed Partial Derivatives – Taylor's Theorem for Functions of R^n to R^1.

UNIT-V **15 Hour**

Functions with Non zeroJacobian Determinants – The Inverse Function Theorem – The Implicit Function Theorem – ExtermaReal Valued Function of Severable Variables – Extremum Problems with Side Conditions.

Text Books

- Barra, G. de. (1981). Measure Theory and Integration. Wiley Eastern Ltd. New Delhi.
- Tom,M.Apostol. (1974). Mathematical Analysis. Addison – Wesley Publishing Company Inc, New York.

Reference Books

- Burkill, J.C. (1951.). *The Lebesgue Integral.* Cambridge University Press. New York.

ORDINARY DIFFERENTIAL EQUATIONS

PMAM103

Semester : I **Credit: 4**
Category : Core II **Hour/Week: 6**
Class &Major : I M.SC Mathematics **Total Hour: 78**

Objectives

To enable the students

- Develop a Strong Background on Finding Solutions to Linear Differential Equations with Constant and Variable Coefficients and also with Singular Points.
- Apply the Existence and Uniqueness of the Solutions of First Order Differential Equations.
- Understand and Develop Analytical Skills.

Learning Outcomes

On completion of the course, the student will be able to

- Effectively Write Mathematical Solutions in a Clear and Concise Manner.
- Locate and Use Information to Solve First and Second Order Ordinary Differential Equations.
- Demonstrate Ability to Think Critically by Determining and using Appropriate Techniques for Solving a Variety of Differential Equations.

UNIT-I **16 Hour**

Second Order Homogeneous Equations-Initial Value Problems-Linear Dependence and Independence - Wronskian and a Formula for Wronskian – Non-homogeneous Equation of Order Two.

UNIT-II **15 Hour**

Homogeneous and Non-homogeneous Equation of Order n – Initial Value Problems- Annihilator Method to Solve Non-homogeneous Equation- Algebra of Constant Coefficient Operators.

UNIT-III **16 Hour**

Initial Value Problems – Existence and Uniqueness Theorems – Solutions to Solve a Non-homogeneous Equation – Wronskian and Linear Dependence – Reduction of the Order of a Homogeneous Equation – Homogeneous Equation with Analysis Coefficients – The Legendre Equation.

UNIT-IV **15 Hour**

Euler Equation – Second Order Equations with Regular Singular Points – Exceptional Cases – Bessel Function.

UNIT-V **16 Hour**

Equation with Variable Separated – Exact Equation – Method of Successive Approximations – the Lipschitz Condition – Convergence of the Successive Approximations and the Existence Theorem.

Text Book

- Coddington, E.A. (1987). *An Introduction to Ordinary Differential Equations.* Prentice-Hall of India Ltd. New Delhi.

Reference Books

- Lebedev. N.N (1965). *Special Functions and their Applications*. Prentice Hall of India. New Delhi.
- Reid, W.T. (1971). Ordinary Differential Equations. John Wiley and Sons. New York.
- Raisinghania, M.D. (2001). *Advanced Differential Equations.* S. Chand & Company Pvt. Ltd. New Delhi.

CALCULUS OF VARIATIONS AND INTEGRAL EQUATIONS

PMAM105

Semester : I **Credit: 4**
Category : Core VII **Hour/Week: 6**
Class & Major : II M.SC Mathematics **Total Hour: 78**

Objectives

To Enable the Students

- Analyze the Problem solving Skills.
- Determine Variational problems and Integral Equation.

Learning Outcomes

On completion of the course, the student will be able to

- Understand the Fundamental concepts of the space relative minimum of an Integral.
- Recognize difference between Volterra and Fredholm Integral Equations, First kind and Second kind, Homogeneous and Inhomogeneous etc.
- Apply different methods to solve Integral Equations.

UNIT I **16 Hour**

Variational Problems with Fixed Boundaries: The Concept of Variation and its Properties – Euler's Equation- Variational Problems for Functionals – Functionals Dependent on Higher

order Derivatives – Functions of Several Independent Variables – Some Applications to Problems of Mechanics.

UNIT-II **12 Hour**

Variational Problems with Moving Boundaries: Movable Boundary for a Functional Dependent on Two Functions – One-Side Variations.

UNIT- III **17 Hour**

Integral Equation: Introduction – Types of Kernels – Eigen Values and Eigen functions – Connection with Differential Equation – Solution of an Integral Equation – Initial Value Problems – Boundary Value Problems.

UNIT-IV **17 Hour**

Solution of Fredholm Integral Equation: Second Kind with Separable Kernel – Orthogonality and Reality Eigen Function – Fredholm Integral Equation with Separable Kernel – Solution of Fredholm Integral Equation by Successive Substitution – Successive Approximation – Volterra Integral Equation – Solution by Successive Substitution.

UNIT-V **16 Hour**

Hilbert – Schmidt Theory: Complex Hilbert Space – Orthogonal System of Functions-Gram Schmit Orthogonalization Process – Hilbert – Schmit Theorems – Solutions of Fredholm Integral Equation of First Kind.

Text Books

- Gupta, A.S. (2005). *Calculus of Variations with Application.* Prentice Hall of India. New Delhi.
- Sudir, K. Pundir. and Rimple, Pundir. (2005). *Integral Equations and Boundary Value Problems.* Pragati Prakasam. Meerut.

References Books

- Hildebrand, F.B. (1968). *Methods of Applied Mathematics.* Prentice – Hall of India Pvt. New Delhi.
- Kanwal, R.P. (1971). *Linear Integral Equations, Theory and Techniques.* Academic Press. New York.
- Elsgolts, L. (1973). *Differential Equations and Calculus of Variations.* Mir Publishers. Moscow.

FUZZY ANALYSIS

PMAM106

Semester : I **Credit: 4**
Category :Core V **Hour/Week: 6**
Class & Major : I M.Sc. Mathematics **Total Hour: 78**

Objectives

To enable the students

- Understand the concepts of Fuzzy Set, Fuzzy Subset and Fuzzy Logic.
- Distinguish Fuzzy Logic from Classical Logic.
- Apply Fuzzy Logic whenever Uncertainty Arises.

Learning Outcomes

On completion of the course, the student will be able to

- Analyse Statistical Data by using Fuzzy Logic Methods.
- Apply Statistical Methods against Fuzzy Logic Methods.
- Demonstrate Fuzzy Logic Methods.

UNIT-I **16 Hour**

Crisp sets – Fuzzy Sets – Additional Properties of Alpha Cut – Representations of Fuzzy sets – Extensions Principle for Fuzzy Sets.

UNIT-II **16 Hour**

Types of Operations – Fuzzy Complements – Fuzzy Intersections – Fuzzy Unions – Combinations of Operations– Aggregation Operations.

UNIT-III **16 Hour**

Fuzzy Numbers– Linguistic Variables– Arithmetic Operations on Intervals – Arithmetic Operations on Fuzzy Numbers – Lattice of Fuzzy Numbers – Fuzzy Equations.

UNIT-IV **16 Hour**

Crisp versus Fuzzy Relations – Binary Fuzzy Relations-Binary Relations on a Single Set –Fuzzy Equivalence Relations– Sup-i-Compositions of Fuzzy Relations-inf-ω_I Compositions of Fuzzy Relations.

UNIT-V **14 Hour**

Classical Logic-Multi valued Logics-Fuzzy Propositions-Fuzzy Quantifiers.

Text Books

- George, J. Klir. and Yuan, Bo. *Fuzzy Sets and Fuzzy Logic-Theory and Applications.* Prentice. India.

Reference Books

- Timothy, J.Ross. (2004). *Fuzzy Logic with Engineering Applications.* John Wiley & Sons Pvt. Ltd. The Atrium, Southern Gate Chichester, West Sussex PO198SQ, England.
- Kaufman, A. (1975). *Introduction to the theory of Fuzzy subsets* Volume – I. Academic Press. New York.

LINEAR ALGEBRA

PMAM210

Semester : II **Credit : 4**
Category : Core VI **Hours/Week : 5**
Class & Major : II M.Sc Mathematics **Total Hour : 65**

Objectives

To Enable the Students

- Understand Linear Transformation on n-dimensional Vector Spaces.
- Analyse various Algebraic Structures.
- Estimate Computational Skills in Linear Algebra.

Learning Outcomes

On completion of the course, the student will be able to

- Recognize and Comprehend Proofs of Formal Statements.
- Generalize the Concepts of a Real (complex) Vector Space to an Arbitrary Finite-Dimensional Vector Space.
- Investigate Properties of Vector Spaces and Subspaces by using Linear Transformations.

Unit I **13 Hour**

Vector spaces – Linear Transformations – Representation of Transformations by Matrices –Linear Functionals – Algebra of Polynomials –Determinants – Properties of Determinants- Characteristic Polynomials – Characteristic Values- Characteristic Vectors- Minimal Polynomials.

Unit II **13 Hour**

Invariant Subspaces – Direct Sum Decompositions - Diagonalization of Linear Operators – Primary Decomposition Theorem.

Unit III **13 Hour**

Cyclic Vectors - Cyclic Subspaces - Cyclic Decomposition Theorem – GeneralisedCayley – Hamilton Theorem - Rational Form - Jordan Canonical Form.

Unit IV **13 Hour**

Bilinear Forms – Positive – Definite, Symmetric and Hermitian Forms – Sylvester`s Theorem.

Unit V **13 Hour**

Spectral Representation of Symmetric, Hermitian and Normal Operators – Applications.

Text Book

- Hoffman, K. and Kunze, R. (2005). *Linear Algebra.* Pearson Education. Prentice-Hall of India.

Reference Books

- Michael Artin. (1994). *Algebra.* Prentice-Hall of India. New Delhi.
- Friedberg, S.H. Insel, A.J. and Spence, L.E. (2002). Linear Algebra. (4^{th}Ed.). Pearson.

MEASURE AND INTEGRATION

PMAM202

Semester :II **Credit : 4**
Category : Core VI **Hour/Week : 5**
Class &Major : I M.SC **Total Hour : 65**

Objectives

To enable the students

- Understand basics of Knowledge in Lebesgue Measure.
- Acquire in depth Knowledge in Multivariable Differential Calculus.

Learning Outcomes

On completion of the course, the student will be able to

- Understand basic notions in Topological Spaces and the n-dimensional space.
- Describe the Construction and Apply the Lebesgue Integral.
- Apply Lebesgue Decomposition and the Radon-Nikodym theorem.

UNIT-I **13 Hour**

Lebesgue Outer Measure – Measurable Sets – Regularity – Measurable Functions – Boreland Lebesgue Measurability.

UNIT-II **13 Hour**

Integration of Non Negative Functions – The General Integral – Riemann and Lebesgue Integrals.

UNIT-III **13 Hour**

Measures and Outer Measures- Completion of a Measure- Measure Spaces- Integration with respect to Measure - L^p Spaces- Completeness of L^p.

UNIT-IV **13 Hour**

Signes Measures- Hahn, Jordan Decompositions- The Randon Nikodym Theorem- Some Applications of the Nikodym Theorem.

UNIT-V **13 Hour**

Measurability in a Product Space- The Product measure and Fubini'sTheorem- Lebegue measure in Euclidean Space.

Text Book

- Barra, G. de. (1981). *Measure Theory and Integration.* Wiley Eastern Ltd. New Delhi.

Reference Books

- Natanson, I.P. *(1960). Theory of Functions of a Real Variable Vol.I& II.* Cambridge University Press. New York.
- Royden, H.L. (2003). *Real Analysis.* Prentice- Hall of India Pvt Ltd. New Delhi.
- GanapathyIyer, V. (1977). *Mathematical Analysis.* Tata McGraw Hill Publishing Company Ltd. New Delhi.

PARTIAL DIFFERENTIAL EQUATIONS

PMAM206

Semester : II **Credit : 4**
Category : Core VII **Hour/Week : 5**
Class &Major : I M.Sc Mathematics **Total Hour : 65**

Objectives:
To enable the students

- Understand the Physical Behavior of the Mathematical Model.
- Discuss the Solution of Higher Order Partial Differential Equations.

Learning Outcomes
On completion of the course, the student will be able to

- Demonstrate the Ideas of Differential Equations in a Coherent and Meaningful Manner for Solving Real World Problems.
- Analyze the Solution to Explain the Underlying Physical Processes.
- Formulate Physical Problems as PDE using Conservation Laws.

UNIT – I **16 Hour**

Formation of PDE -Solution of PDE First order – Integral Surfaces – Cauchy Problem Order Equation – Orthogonal Surfaces – First Order Non- Linear – Characteristics – Compatible System – Charpit'sMethod. Fundamentals Classifications and Canonical forms of PDE.

UNIT - II **13 Hour**

First Order Non- linear – Characteristics – Compatible System – Charpit's Method.

UNIT – III **10 Hour**

Introduction- Classification of Second Order PDE-Canonical Forms - Adjoint Operators.

UNIT – IV **13 Hour**

Derivation of One- Dimensional Wave Equation -Solution of One- Dimensional Wave Equation by Canonical Reduction – IVP – D' Almembert'sSolution – Vibrating String – Forced Vibration – IVP and BVP for Two Dimensional Wave Equation.

UNIT – V **13 Hour**

Derivation of Laplace and PoissionEquation – BVP – Separation of Variables - Dirichlet's Problem and Newmann Problem for a Rectangle – Elementary Solution of Diffusion Equation – Dirac-Delta Function – Separation of Variables Method.

Text Book

- Shankar Rao, S. (2005). *Introduction to Partial Differential Equations*. Prentice Hall of India. (2nd Ed.). New Delhi.

Reference Books

- McOwen, R.C. (2005). *Partial Differential Equations*. Pearson Education. (2nd Ed.). New Delhi.
- Raisinghania, M.D. (2001). *Advanced Differential Equations.* S.Chand & Company Ltd. New Delhi.
- Sneddon, I.N. (1983). *Elements of Partial Differential Equations.* McGraw hill. New Delhi.

CLASSICAL MECHANICS

PMAM207

Semester : II **Credit : 4**
Category : Core VIII **Hour/Week : 5**
Class & Major : I M.Sc Mathematics **Total Hour :65**

Objectives:

To enable the students

- Understand the Structure of Classical Mechanics and to Outline some of its Applications in Physics.
- Apply Lagrange's and Hamilton's Principle.

Learning Outcomes

On completion of the course, the student will be able to

- Define Mechanical Concepts related to Discrete and Continuous Mechanical Systems.
- Describe the Vibrations of Discrete and Continuous Mechanical System.
- Derive Planar and Spatial Motion of a Rigid Body.

UNIT - I **16 Hour**

Mechanics of a Particle - Mechanics of a System of Particle-Constraints-D'Alembert's Principle and Lagrange's Equations-Simple Applications of the Lagrangian Formulation.

UNIT – II **10 Hour**

Hamilton's Principle-Some Techniques of the Calculus of Variations-Derivation of Lagrange's Equations from Hamilton's Principle-Extension of Hamilton's Principle to Nonholonomic Systems.

UNIT - III **13 Hour**

Advantages of Variational Principle Formulation-Conservation Theorems and Symmetry Properties-Energy Function and the Conversion of Energy.

UNIT - IV **10 Hour**

The Hamilton –Jacobi Equation for Hamilton's Principle Function - The Harmonic oscillator Problem as an example of the Hamilton Jocobi Method - The Hamilton –Jacobi Equation for Hamilton's Characteristic Function-Seperation of Variables in the Hamilton-Jacobi Equation-Ignorable Coordinates and the Kepler Problem.

UNIT - V **16 Hour**

The Equations of Canonical Transformations- Examples of Canonical Transformations-The Symplectic Approach Canonical Transformations-Poisson Brackets and Other Canonical Invariants-Equations of Motions, Infinitesimal Canonical Transformations, and Conservation Theorems in the Poisson Brackets Formulation-The Angular Momentum Poisson Brackets Relations-Liouville's Theorem.

Text Book

- Green Wood, D. (1985). *Classical Mechanics.* Prentice Hall of India. New Delhi.

Reference Book

- Herbert Goldstein. Charles Poole. John Safko. (2000). *Classical Mechanics.* Addison Wesley. (3rd Ed). India.

OPERATIONS RESEARCH

PMAM208

Semester : II **Credit :4**
Category : Core IX **Hour/Week : 5**
Class &Major : I M.SC Mathematics **Total Hour : 65**

Objectives

To enable the students

- Understand Queuing Systems, Network Schedule, Sensitivity and Decision Analysis.
- Use Algorithms for Solving Problems.

Learning Outcomes

On completion of the course, the student will be able to

- Understand the Characteristics of Decision-Making Environments.
- Solve Transportation Models and Assignment Models.
- Design New Simple Models like CPM, MSPT to Improve Decision – Making Skills.

UNIT - I **12 Hour**

Graphical Sensitivity Analysis - Algebraic Sensitivity Analysis–Right-Hand Side of the Constraints - Algebraic Sensitivity Analysis–Objective-Function Coefficients - Sensitivity Analysis with TORA, Excel Solver, and AMPL.

UNIT - II **14 Hour**

Illustrative Application - Integer Programming Algorithms**:** Branch-and-Bound (B&B) Algorithm Cutting-Plane Algorithm.

UNIT - III **12 Hour**

Network Representation - Critical Path Computations - Construction of the Time Schedule - PERT Calculations.

UNIT – IV **16 Hour**

Generalized Poisson Queuing Model - Specialized Poisson Queues: Steady-State Measures of Performance - Single-Server Models - Multiple-Server Models - Machine Servicing Model–*(M/M/R)* : *(GD/K/K)*,$R<K$ - Pollaczek-Khintchine (P-K) Formula.

UNIT - V **11 Hour**

Decision Making under Certainty–Analytic Hierarchy Process (AHP) - Decision Making under Risk - Expected Value Criterion - Variations of the Expected Value Criterion - Decision under Uncertainty.

Text Book

- Hamdy, A. Taha. (2010). *Operations Research.* Prentice Hall. India.

Reference Book

- Kapoor, V.K. (1996). *Introduction to Operations Research.* Sultan Chand & Sons. New Delhi.

MATHEMATICS FOR HIGH SCHOOL STUDENTS /ELEMENTARY MATHEMATICS FOR HIGHER SECONDARY STUDENTS

PMAX 201/PMAX202

Semester : II **Credit: 1**

Category : Service Learning

Class and Major : I M.Sc. Mathematics

Objectives

To enable the students

- Acquire Indepth Knowledge in Matrices and Complex Numbers.
- Inculcate Innovative Teaching Methods.
- Apply the Technique of Differentiation.

Learning Outcomes

On completion of the course, the student will be able to

- Understand Mathematics and to Teach Easily.
- Apply National and State Standards for Mathematics education to develop content-Appropriate Lessons.
- Use and Compare Different Assessment Techniques.

UNIT: I MATRICES

Introduction to Matrix - Adjoint of the Matrix-Inverse of the Matrix - Rank of the Matrix - Consistency of the Linear Equations.

Activity: Lecture, Chart Presentation

UNIT: II VECTOR ALGEBRA

Vectors - Angle between Two Vectors - Scalar Product - Vector Product - Product of Three Vectors - Lines and Planes.

Activity: Lecture, Chart Presentation

UNIT III COMPLEX NUMBERS

The Complex Number System - Conjugate of the Complex Numbers - ordered Pair of Representation - Modulus of the Complex Numbers - De-Moivre's Theorem and its Applications Roots of the Complex Numbers.

Activity: Lecture, Chart Presentation.

UNIT: IVANALYTICAL GEOMETRY

Conic: Parabola-Ellipse-Hyperbola. Parametric forms of Conics.

Activity: Lecture, Model Presentation.

UNIT: V DIFFERENTIAL CALCULUS

Derivative as Measure – Rate of Change – Velocity – Acceleration – Related Rates Derivative as a Measure of Slope.

Activity: Lecture, Power Point Presentation

Reference Books

- Narayanan.Manicavachagom Pillay, T.K. (1996). *Algebra VolumeI*. Viswanathan. S Publishers & Printers. Pvt.Ltd. Chennai.
- Narayanan. Manicavachagom Pillay, T.K. (1994). *Trignometry*. Viswanathan. S Publishers & Printers. Pvt. Ltd. Chennai.
- Narayanan. Manicavachagom Pillay, T.K. (1997). *Vector Algebra*. Viswanathan. S Publishers & Printers. Pvt. Ltd. Chennai.
- Narayanan. Manicavachagom Pillay, T.K. (1993). *Analytical Geomentry of 2D*. Viswanathan.S Publishers & Printers. Pvt. Ltd. Chennai.

LATEX AND MATLAB

PMAE 101/PMAE209

Semester : I **Credit : 4**
Category : Non Major Elective **Hour/Week : 5**
Class &Major : I PG **Total Hour : 65**

Objectives:

To enable the students

- Understand Documentation in Computer.
- Develop Computer Skills.

Learning Outcomes

On completion of the course, the student will be able to

- Use LaTeX file in Project Works.
- Write Mathematical Document in LATeX File.

UNIT I DOCUMENTATION **10 Hour**

Document Layout and Organization-Document Class- Page Style- Parts of the Document- Text Formatting- TeX and its Offspring- What's Different in Latex 2€-Distinguishing Latex 2€ and Basics of Latex File.

UNIT II COMMANDS **15 Hour**

Commands and Environment-Commands Names and Argument- Environments-Contents,-Fine – Tuning Text- Word Division- Labeling-Referencing- Displayed Text-Changing Font- Centering and Indenting- Lists-Generalised Lists- Theorem-like Declaration -Tabulator Stops- Boxes.

UNIT III TABLES **15 Hour**

Tables- Printing Literal Text- Footnodes and Marginal Notes-Drawing Pictures using Latex-Mathematical Formulas-Mathematical Environment- Main elements of Math Mode-Mathematical Symbols- Addition elements- Fine – Tuning Mathematics.

UNIT IV MATLAB **12 Hour**

Introduction-Basics of MATLAb- Input-Output- File Types-Platform Dependence-General Commands-Interactive Computation: Matrices and Vectors.

UNIT V FUNCTIONS **13Hour**

Matrix and Array Operation-Creating and using Inline Functions-Using Built –in Functions and On-Line Help-Saving and Loading Data-Plotting Simple Graphs-Basics Programming in MATLAB-Creating cps Files using MATLAB.

Text Books

- Daly, P.W. (1999). *A Guide to LaTeX* by H.Kopka. Adison Wesley. London.
- Rudra Pratap. (2003). *Getting Started with MATLAB – A Quick Introduction for Scientists and Engineers*. Oxford University Press. New York.

OPERATIONS RESEARCH

PMAE102/PMAE208

Semester : I **Credit: 4**
Category : NME **Hour/Week : 5**
Class & Major: I PG **Total Hour : 65**

Objectives:
To enable the students

- Identify various Techniques of Research.
- Discuss Real Life Problems in Business and Management.
- Apply Management Techniques.

Learning Outcomes
On completion of the course, the student will be able to

- Examine the Types of Transformation Processes Occurring within Operations.
- Define the Roles and Responsibilities of Operations Managers.
- Reflect on Your Own Operations Management Responsibilities.

UNIT-I **13 Hour**

Mathematical Formulation of the Problem- Graphical Solution Method -General Linear Programming Problem - The Computational Procedure- Use of Artificial Variable Techniques- Big- M Method Simple Problems.

UNIT-II **13 Hour**

General Transportation Problem-The Transportation Table-Loops in Transportation Tables-Solution of a Transportation Problem-Finding an Initial Basic Feasible Solution-Test for Optimality-Degeneracy in Transportation Problem-Transportation Algorithm(MODI Method). Simple Problems.

UNIT-III **13 Hour**

Mathematical Formulation of the Problem- the Assignment Method- Special Cases in Assignment Problem. Simple Problems.

UNIT-IV **13 Hour**

Two-person Zero-Sum Games- Some Basic Terms- The Maximin - Minimax Principle- Games Without Saddle Points-Mixed Strategies- Graphic Solution of $2 \times n$ and $m \times 2$ Games- Dominance Property. Simple Problems.

UNIT-V **13 Hour**

Network and Basic Components- Logical Sequencing- Rules of Network Construction- Critical Path Analysis- Probability Considerations in PERT- Distinction between PERT and CPM. Simple Problems.

Text Book

- Kanti Swaroop,Gupta P.K. and Manmohan. (2003).*Operations Research.* Sultan Chand &Sons. New Delhi.

Reference Books

- Kapoor, V.K. (1996). *Introduction to Operations Research*. Sulthan Chand & Sons. New Delhi.
- Taha, A Handy. (2000). *Operations Research-An Introduction*. Prentice Hall of India Pvt. Ltd. New Delhi.

DISCRETE MATHEMATICS

PMAE203

Semester : II **Credit : 4**
Category : Non-Major Elective **Hour/Week : 5**
Class & Major : I PG **Total Hour : 65**

Objectives:

To enable the students

- Understand the concepts of Set Theory and Finite Automata.
- Apply recursive functions in a computer environment.

Learning Outcomes

On completion of the course, the student will be able to

- Understand Logical Proofs in Discrete Mathematics.
- Apply Advanced Principles of Counting.
- Determine Equivalent Logic Expressions.

UNIT-I **15 Hour**

Introduction – TF Statements – Connectives – Atomic and Compound Statements – Well formed Formulae.

UNIT-II **15 Hour**

Tautology – Tautology Implications and Equivalence of a Formulae. Replacement Process.

UNIT-III **15 Hour**

Functionally Complete Sets of Connectives and Duality law – Normal forms Principles of Normal Forms –Lattices – Some Properties of Lattices – Hasse Digrams– Notations- Boolean Algebras – Boolean Polynomials.

UNIT-IV **10 Hour**

Basic concepts – Digraph, Incidence and Degree-Subgraph - Isomorphism.

UNIT-V **10 Hour**

Introduction – Finite Automata - Definition of Finite Automation - Representation of Finite Automation-Acceptability of a String by Finite Automata.

Text Book

- Venkataraman, M.K. Sridharan, N.& Chandrasekaran, N. (2000). *Discrete Mathematics*. The National Publishing Company. India.

Reference Books

- Sundaresan, V. Ganapathy Subramanian, K.S.& Ganesan, K. (1996). *Discrete Mathematics.* A.R. Publications.
- Tremblay, J.P. Manohar. R.(1999). *Discrete Mathematical Structures with Applications to Computer Science*. Tata Mc Graw Hills Publications Company Pvt. Ltd. New Delhi.

III & IV EVALUATION COMPONENTS OF CIA

Semester	Category	Course code	Course Title	Component III	Component IV
I	Major Core IV / DSC IV	PMAM105	Calculus of Variations and Integral Equations	Assignment	Term Paper
	Major Core V/ DSC V	PMAM106/ PMAM407	Fuzzy Analysis	Assignment	Seminar
	Major Core I / DSC (I)	PMAM108	Abstract Algebra	Assignment	Seminar
	Major Core II / DSC II	PMAM102	Real Analysis	Assignment	Term Paper
	Major Core III / DSC III	PMAM103	Ordinary Differential Equations	Assignment	Problem Solving
II	Major Core VI / DSC VI	PMAM210	Linear Algebra	Assignment	Seminar
	Major Core VII / DSC VII	PMAM202	Measure and Integration	Assignment	Seminar
	Major Core VIII / DSC VIII	PMAM206	Partial Differential Equations	Assignment	Problem Solving
	Major Core IX / DSC IX	PMAM204	Classical Mechanics	Assignment	Seminar
	Major Core X / DSC X	PMAM208	Operations Research	Assignment	Problem Solving

III & IV EVALUATION COMPONENTS OF CIA-NME

Semester	Category	Course code	Course Title	Component III	Component IV
I	Non Major Elective	PMAE101/ PMAE209	LaTeX and MATLAB	Assignment	Seminar
		PMAE102/ PMAE208	Operations Research	Assignment	Problem Solving
		PMAE103	Discrete Mathematics	Assignment	Problem Solving

DEPARTMENT OF PHYSICS

PREAMBLE

UG: Program Profile and list of Courses offered to other Departments and Syllabi of Courses in the I & II Semesters along with Evaluation Components III & IV (with Effect from 2021-2024 Batch onwards) and

PG: Program Profile and list of Courses offered to other Departments and Syllabi of Courses in the I & II Semesters along with Evaluation Components III & IV (with Effect from 2021-2023 Batch onwards)

PROGRAMME PROFILE B.Sc., PHYSICS

PROGRAMME SPECIFIC OUTCOMES (PSO)

Upon completion of the programme, the students will be able to

- Ability to solve and apply the Concepts of Physics in various fields like Material Science, Mechanics, Thermal Physics and Electricity.
- Learning of Laboratory Skills, enabling Measurements in basic Physics and Analysis of Measurements to draw valid Conclusions.
- Developing the Problem Solving Skills and Scientific Reasoning for the Prospective Physicists and Logical Reasoning.
- Analyze the behavior of Materials from Atomic Level to Macroscopic Level.

Semester	Part	Category	Course code	Course Title	Previous Course Code	Contact Hrs/Week	Credit Min/ Max
I	I	Languages / AECC – II Tamil/ Hindi/ French	UTAL107/ UTAL108	Basic Tamil I/ Advanced Tamil I	UTAL105/ UTAL106/ UHIL101/ UFRL101	5	3/4
	II	Communicative English /AECC – I	UENL109/ UENL110	English for Communication (Stream – I)/ English for Communication (Stream – II)	UENL107/ UENL108	5	3/4
	III	Major Core (DSC) – I	UPHM106	Properties of Matter	-	4	4
	III	Major Core (DSC) – II	UPHM107	Mechanics	UPHM103	5	5
	III	Major Core (DSC) – III	UPHR102/ UPHR202	Major Practical I	-	3	2
	III	Allied (GE) – I	UMAA114	Allied Mathematics I	UMAA104	6	5
	III	PE	UPEM101	Professional English I	-	6	4
	IV	Value Education (SEC)			-	2	1
					TOTAL	**36**	**27/29**
II	I	Languages / AECC – II Tamil/ Hindi/ French	UTAL207/ UTAL208	Basic Tamil I/ Advanced Tamil I	UTAL205/ UTAL206 UHIL201/ UFRL201	5	3/4
	II	Communicative English /AECC – I	UENL209/ UENL210	English for Communication (Stream – I)/ English for Communication (Stream – II)	UENL207/ UENL208	5	3/4
	III	Major Core (DSC) – IV	UPHM204	Thermal and Statistical Physics	UPHM203	4	4
	III	Major Core (DSC) – V	UPHM205	Optics	UPHM302/ UPHM406	4	4

Semester	Part	Category	Course Code	Course Title	Previous Course Code	Contact Hrs/Week	Credit Min/ Max
II	III	Major Core (DSC) – VI	UPHR203/ UPHR101	Major Practical II	-	3	2
	III	Allied (GE) - I	UMAA222	Allied Mathematics II	UMAA212	6	5
	III	PE	UPEM201	Professional English I	-	6	4
	IV	NME (Skill Enhancement Course)	-	-	-	3	2
	V	Extension Programme/ Physical Education/NCC	-	-	-	-	1/2
					TOTAL	**36**	**28/31**
III	I	Languages / AECC – II Tamil/ Hindi/ French	UTAL307/ UTAL308	Basic Tamil I/ Advanced Tamil I	UTAL305/ UTAL306/ UHIL301/ UFRL301	5	3/4
	II	Communicative English /AECC – I	UENL309/ UENL310	English for Communication (Stream – I)/ English for Communication (Stream – II)	UENL307/ UENL308	5	3/4
	III	Major Core (DSC) – VII	UPHM303	Electricity and Magnetism	UPHM402	5	4
	III	Major Core (DSC) – VIII	UPHM304	Mathematical Physics	UPHM509	4	3
	III	Major Core (DSC) – IX	UPHR303	Major Practical III	-	3	2
	III	Allied (GE) - III	UCSA306	Computational Physics with Python	-	3	3
	III	Allied (GE) - IV	UCSR310	Computational Physics with Python Lab	-	3	2
	IV	Value Education (SEC)	-	-	-	2	1
					TOTAL	**30**	**21/23**
IV	I	Languages / AECC – II Tamil/ Hindi/ French	UTAL407/ UTAL408	Basic Tamil I/ Advanced Tamil I	UTAL405/ UTAL406/ UHIL401/ UFRL401	5	3/4
	II	Communicative English /AECC – I	UENL409/ UENL410	English for Communication (Stream – I)/ English for Communication (Stream – II)	UENL407/ UENL408	5	3/4
	III	Major Core (DSC) – X	UPHM407	Atomic Physics	-	6	4
	III	Major Core (DSC) – XI	UPHR405	Major Practical IV	-	3	3
	III	Allied (GE) - V	UCHA401/ UCHA402/ UCHA403	Chemistry for Physics	-	3	3
	III	Allied (GE) - VI	UCHA402/ UCHR403	Volumetric and Organic Analysis-I	-	3	2
	IV	NME (Skill Enhancement Course)	UPHE403/ UPHE404	Electronic Communication System / Applied Electronics	-	3	2
	IV	Soft Skill (SEC)			-	2	1
	V	Extension Programme/ Physical Education/NCC			-	-	-/2
					TOTAL	**30**	**21/25**

Semester	Part	Category	Course Code	Course Title	Previous Course Code	Contact Hrs/Week	Credit Min/ Max
V	III	Major Core (DSC) – XII	UPHM507	Quantum Mechanics	-	5	5
	III	Major Core (DSC) – XIII	UPHM505	Basic Electronics	-	4	4
	III	Major Core (DSC) – XIV	UPHM506	Solid State Physics	UPHM608	4	4
	III	Major Elective (Discipline Specific Elective) - XV	UPHO501/ UPHO502	Medical Physics / Energy Physics	-	4	4
	III	Major Core (DSC) – XVI	UPHR502	Major Practical V	-	3	3
	III	Major Core (DSC) – XVII	UPHP501/ UPHP502	Project / Instrumentation Techniques	-	5	4/5
	III	Online Course		NPTEL/Spoken Tutorial	-	3	½
	IV	Value Education (SEC)			-	2	1
TOTAL						**30**	**26/28**
VI	III	Major Core (DSC) – XVIII	UPHM609	Numerical methods and Basic Computational Physics	-	5	4
	III	Major Core (DSC) – XIX	UPHM611	Nuclear and Radiation Physics	-	5	4
	III	Major Core (DSC) – XX	UPHM612	Material Science	-	5	4
	III	Major Core (DSC) – XXI	UPHM613	Digital Electronics	-	5	4
	III	Major Core (DSC) – XXII	UPHR605	Major Practical VI	-	3	3
	III	Major Elective (Discipline Specific Elective) - XXIII	UPHO601/ UPHO603/ UPHO604	Nanophysics/ Functional Materials/ Astrophysics and Special Theory of Relativity	-	5	4
	III	Viva Voce	UPHM610	Comprehensive Viva Voce	-	-	1
	IV	Soft Skill (SEC)			-	2	1
	V	Extension Program -me/Physical Education/NCC			-	-	-/2
TOTAL						**30**	**25/27**
GRAND TOTAL						**192**	**148/163**

LIST OF COURSES OFFERED TO OTHER DEPARTMENTS
NON-MAJOR ELECTIVES

Semester	Part	Category	Course Code	Course Title	Previous Course Code	Contact Hrs/Week	Credit Min/ Max
II	IV	Non Major Elective (Skill Enhancement Course)	UPHE202	Applied Physics	-	3	2
			UPHE203	Biomedical Instrumentation	-	3	2
			UPHE204	Electrical Appliances	-	3	2
			UPHE205	Telecommunication System	UPHE304 /UPHE503	3	2
			UPHE206	Servicing and maintenance of home appliances	UPHE303	3	2

ALLIED

Semester	Part	Category	Course Code	Course Title	Previous Course Code	Contact Hrs/ Week	Credit Min/ Max
I	III	Allied (GE) – I	UPHA102	Allied Physics-I	UPHA101	3	3
I	III	Allied (GE) – II	UPHR103	Physics for Chemistry Practical – I	UPHR102	3	2
II	III	Allied (GE) - III	UPHA203	Allied Physics-II	UPHA202	3	3
II	III	Allied (GE) – IV	UPHR202	Physics for Chemistry Practical – II	-	3	2
III	III	Allied (GE) – V	UPHA303	Digital Electronics for Computer Science	-	3	3
III	III	Allied (GE) – VI	UPHR303	Digital Electronics Practical for Computer Science	-	3	2
IV	III	Allied (GE) – VII	UPHA402	Electronics for Mathematics	-	3	3
IV	III	Allied (GE) – VIII	UPHR402	Electronics Practical for Mathematics	-	2	2
IV	III	Allied (GE) – IX	UPHA403	Electronics for Computer Science	-	3	3
IV	III	Allied (GE) – X	UPHR403	Electronics Practical for Computer Science	-	3	2

Inclusion of Experiential Learning

A. Experiential Learning (Mandatory)

Course Mapping				Collaborating Agency - MSME		
Semester	Course Code	Course Title	Assessment	Course Title	Hour / Days/ Month	Mode of Evaluation
IV	UPHM407	Atomic Physics	Component IV	Solar Energy	4 Days	Reflection

B. Skill Orientation Programme (Only for the interested students) – Extra Credit Earning Provision

Semester	Category	Course Code	Course Title	Collaborating Agency	Hour / Days/ Month	Mode of Evaluation	Credits (Min/Max)
V	Core	UPHT501	PCB Design	MSME	4 days	Reflection	1

EXTRA CREDIT EARNING PROVISION

Semester	Part	Category	Course Code	Course Title	Hour per Week	Credits (Min/Max)
II	III	Core	UPHI201	Internship	-	1
IV	III	Core	UPHI401	Internship	-	1
VI	III	Core	UPHI601	Internship	-	1

PROPERTIES OF MATTER

UPHM106

Semester : I **Credit: 4**
Category : Major Core (DSC) – I **Hour/Week : 4**
Class & Major : I B.Sc., Physics **Total Hour : 65**

Objectives

To enable the students

- Understand the basics of Elasticity and its Importance in Beams and Griders.
- Apply the concepts of Surface Tension, Viscosity and their Applications.
- Analyze the Importance of Sound and its Application.

Learning Outcomes

On completion of the course, the students will be able to

- Evaluate the Strength of the Solid Materials of Different Size.
- Create the Streamline, Turbulent Flow of Liquids and Ultrasound.

UNIT – I ELASTICITY **12 Hour**

Introduction – Stress, Strain, Hooke's Law – Types of Elasticity – Poisson's Ratio – Workdone due to Strain – Relation between the Elastic Moduli – Torsion – Torsional Oscillations of a Body – Rigidity Modulus by Torsion Pendulum.

UNIT – II BENDING OF BEAMS **14 Hour**

Cantilever - Expression for Bending Moment - Expression for Depression - Cantilever Oscillations - Expression for Time Period - Experiment to find Young's Modulus - Non Uniform Bending - Experiment to determine Young's Modulus by Koenig's Method - Uniform Bending - Expression for Elevation - Experiment to determine Young's modulus using microscope.

UNIT – III SURFACE TENSION **12 Hour**

Introduction – Explanation of Surface Tension in Kinetic Theory – Surface Energy – Angle of Contact – Express Pressure inside a Liquid Drop and Soap Bubble – Variation of Surface Tension with Temperature – Drop Weight Method of Determination the S.T of a Liquid – Interfacial Tension- Experiment to Determine the Interfacial Tension between Water and Kerosene.

UNIT – IV VISCOSITY **14 Hour**

Introduction – Streamline and Turbulent Flow – Determination of Critical Velocity – Poiseuill's Formula – Correction – Poiseuill's Method for Determination Coefficient of a Liquid – Terminal Velocity – Stoke's Formula – Stoke's Method for Determination the Coefficient of Viscosity of a Liquid – Variation of Viscosity with Temperature and Pressure – Friction and Lubrication - Fick's Law of Diffusion – Analogy with Heat Conduction – Experimental Determination of Coefficient of Diffusion.

UNIT – V ACOUSTICS **13 Hour**

Forced Vibrations – Damped Vibrations – Resonance – Intensity of Sound – Noise Pollution – Transverse Vibration of a Stretched String – Expression for the Velocity of Transverse Vibration of a Stretched String – Expression for the Transverse Vibration of a Stretched String – Laws of Vibration of Strings – A.C. Frequency Measurement using Sonometer – Ultrasonics – Production of Ultrasonic Waves – Use of Ultrasonics.

Text Books

- Murugeshan, R. and Kiruthiga, S. (2010). *Properties of Matter and Acoustics*. S. Chand & Company Ltd. New Delhi.
- Murugeshan, R. (2017). *Properties of Matter*. S. Chand & Company Ltd. New Delhi.

Reference Books

- Halliday, D.R. and Walker, J. (2006). *Fundamentals of Physics*. Wiley. (6th Ed). New York.
- Murugeshan, R. (2005). *Waves and Oscillations*. S. Chand & Company Ltd. New Delhi.

E – Resources

- http://www.vssut.ac.in/lecture_notes/lecture1423904647.pdf
- https://www.win.tue.nl/~sjoerdr/papers/boek.pdf

MECHANICS

UPHM107

Semester : I **Credit: 5**
Category : Major Core (DSC) – II **Hour/Week : 5**
Class & major : I B.Sc., Physics **Total Hour : 65**

Objectives:
To enable the students

- Describe the Concepts of Different Types of Motion and Gravitation.
- Interpret the Dynamics of Rigid Bodies in Terms of Moment of Inertia.
- Apply the Basics of Fluid Mechanics and its Applications.

Learning Outcomes
On completion of the course, the students will be able to

- Relate the Elementary Mathematics along with Physical Principles to Effectively Solve Problems Encountered in Everyday Life.
- Evaluate the Dynamics of Rigid Bodies and Fluids.

UNIT – I LAWS OF MOTION **13 Hour**

Newton's Laws of Motion – Conservation of Energy-Conservation Forces-Conservation of Linear Momentum-Center of Mass – Angular Momentum – Conservation of Angular Momentum – Relation between Torque and Angular Momentum – Rocket Motion – Principle – Theory – Velocity of the Rocket at any Instant – Rocket Propulsion System – Multi Stage Rocket – Shape of the Rocket – Artificial Satellites.

UNIT – II GRAVITATION **15 Hour**

Kepler's Law – Newton's Law of Gravitation - Determination of G by Boy's Method – Density of Earth – Mass of the Earth and Sun – Gravitational Field – Intensity of the Field – Gravitational Potential – Potential Energy – Inertial and Gravitational Masses – Escape and Orbital Velocity – Acceleration due to Gravity – Value of 'g' at the Poles and at the Equator – Variation of 'g' with Latitude, Altitude & Depth – Compound Pendulum – Radius of Gyration – Determination of 'g' by Compound Pendulum.

UNIT – III CIRCULAR MOTION **13 Hour**

Angular Displacement – Angular Velocity – Relation between Linear Velocity and Angular Velocity – Acceleration in Uniform Circular Motion – Centripetal Force and Centrifugal Force – Applications – Condition for Skidding and Overturning of a Car Taking a Turn – Motion in Horizontal Circle – Friction Present on the Road – Motion in Vertical Circle – Centrifuge.

UNIT – IV MOMENT OF INERTIA **10 Hour**

Rigid body – Moment of Inertia – Parallel Axes Theorem – Perpendicular Axes Theorem – Moment of Inertia of a Thin Rod, Solid Cylinder, and Solid Sphere – Hollow Sphere with External and Internal Radii – Kinetic Energy of Rotation.

UNIT – V FLUID MECHANICS **14 Hour**

Fluid Pressure - Forces on Solid Surfaces - Buoyant Forces - Equations for Acceleration - Continuity Equation, Irrotational and Rotational Flow - Potential and Stream Functions - Equation of Continuity – Energy of the Liquid – Bernoulli's Theorem – Proof – Applications of Bernoulli's Theorem – Venturimeter – Pitot's Tube.

Text Books

- Murugeshan, R. (2008). *Mechanics and Mathematical Physics*. S. Chand & Company Ltd. New Delhi.
- Brij Lal, Subramaniam. (2002). *Properties of Matter*. Eurasia Publishing House. New Delhi.

Reference Books

- Halliday, D.R. Walker, J. (2006). *Fundamentals of Physics.* Willey. (6th Ed.). New York.
- Mathur, D.S. *Mechanics*. (2005). S. Chand & Company Ltd. New Delhi.

E – Resources

- https://salmanisaleh.files.wordpress.com/2019/02/fundamentals-of-physics-textbook.pdf
- https://people.maths.bris.ac.uk/~maxmr/Mechanics1/intro.pdf
- https://vssut.ac.in/lecture_notes/lecture1427495313.pdf

MAJOR PRACTICAL-I

UPHR102

Semester : I **Credit : 2**
Category : Core Practical I **Hours/Weeks : 3**
Class & Major : I B.Sc., Physics **Total Hours :39**

Objectives:

To enable the students

- Understand the Theory of the Application of Subject Knowledge.
- Determine the Techniques of Handling Equipments.
- Compute Error Free Measurements and Error Analysis.

Learning Outcomes

On completion of the course, the students will be able to

- Demonstrate Knowledge and Comprehension of the Basic of Physics.
- Develop Independent Problem Solving Skills.

1. Young's Modulus-Cantilever Depression Using Scale and Telescope.
2. Young's Modulus-Uniform Bending-Scale and Telescope.
3. Young's Modulus-Non Uniform Bending-Pin and Microscope.
4. Rigidity Modulus –Torsion Pendulum-(With and Without Masses).
5. Surface Tension-Capillary Rise Method-(Radius using Vernier Microscope).
6. Sonometer - A.C. Frequency-Steel and Brass Wire.
7. Co-efficient of Viscosity of a Liquid-Constant Pressure Head.
8. Sonometer-Frequency of Tuning Fork.
9. Young's Modulus-Uniform Bending-Koenig's Method.
10. Rigidity Modulus- Static Torsion.

Text Books

- Srinivasan, M.N. Balasubramanian, S. Ranaganathan, R. (2006). *The Text Book of Practical Physics*. Sultan Chand and Sons. New Delhi.
- Ouseph, C.C. Ranagarajan, G. (1990). *A Textbook of Practical Physics Part-I*. S. Viswanathan Publisher.

Reference Book

- Gupta, S.L. Kumar, V. (2002). *Practical Physics*. Pragathi Prakashan. (25th Ed.).

MAJOR PRACTICAL-II
UPHR203

Semester	**: I**	**Credit**	**:2**
Category	**: Core Practical-II**	**Hours/Week**	**: 3**
Class & major	**: I B.Sc Physics**	**Total Hours**	**: 39**

Objectives:

To enable the students

- Understand the Theory of the Application of Subject Knowledge in Practical.
- Demonstrate the Techniques of Handling Equipments.
- Make Error Free Measurements and Error Analysis.

Learning Outcomes

On completion of the course, the students will be able to

- Demonstrate Knowledge and Comprehension of the Basic of Physics.
- Develop Independent Problem Solving Skills.

1. Compound Pendulum-Acceleration due to Gravity ‘g’ and Radius of Gyration.
2. Bifilar Pendulum-Verification of M.I Theorem.
3. Specific Heat Capacity – Newton’s Law of Cooling.
4. Lee’s Disc – Thermal Conductivity of Card Board.
5. Specific Heat of a Liquid – Verification of Newton’s Law of Cooling.
6. Thermistor – Temperature Coefficient ‘’a’’ – Multimeter.
7. Thermocouple – Temperature Coefficient ‘’a’’ – Multimeter.
8. P.O Box – Temperature Coefficient of Thermistor.
9. Bifilar Pendulum – Determination of Earth’s Gravitation Field.
10. Measurement of Stefan’s Constant.

Text Books

- Srinivasan, M.N. Balasubramanian, S. Ranaganathan, R. (2006). *The Text Book of Practical Physics*. Sultan Chand and Sons. New Delhi.
- Ouseph, C.C. Ranagarajan, G. (1990). *A Textbook of Practical Physics Part-I*. S. Viswanathan Publisher.

Reference Book

- Gupta, S.L. Kumar, V. (2002). *Practical Physics*. Pragathi Prakashan. (25th Ed.).

THERMAL AND STATISTICAL MECHANICS

UPHM204

Semester : II **Credit : 4**
Category : Major Core (DSC) – IV **Hour/Week : 4**
Class & major : I B.Sc., Physics **Total Hour : 65**

Objectives:

To enable the students

- Remember the Basics Principles of Heat and Laws of Thermodynamics.
- Interpret the Importance in Liquefaction of Gases.
- Apply the Concepts of Thermodynamics in Statistical Physics.

Learning Outcomes

On completion of the course, the students will be able to

- Categorize the Applications of Thermodynamics to Heat Engines and the Working Principle of Refrigerator.
- Evaluate the Concepts of Entropy, Thermodynamic Probability and Statistical Physics.

UNIT – I TRANSMISSION OF HEAT **13 Hour**

Introduction – Coefficient of Thermal Conductivity – Lee's Disc Method – Convection – Applications of Convection – Central Heating System – Thermopile – Radiation – Thermal Radiation – Black Body – Stefan's Law – Experimental Verification of Stefan's Law – Distribution of Energy in Black Body Spectrum – Wien's Law – Rayleigh – Jeans Law – Newton's Law of Cooling – Experimental Verification of Newton's Law of Cooling – Planck's Radiation Law – Solar Constant – Temperature of the Sun – Angstrom's Pyrheliometer.

UNIT – II THERMOMETRY **13 Hour**

Definition of Temperature – Platinum Resistance Thermometer – Construction & Working – Thermistor – Specific Heat Capacity – Dulong and Petit's Law – Calorimeter – Specific Heat of a Gas – Relation between Specific Heat of a Gas – Mayer's Expression – Jolly's Differential Steam Calorimeter for Finding C_V - Callendar and Barne's Continuous Flow Method – Basis of Kinetic Theory – Maxwell's Laws of Velocity of Distribution – Experimental Verification of Maxwell Boltzmann Distribution – Degrees of Freedom – Mean Free Path.

UNIT – III LAWS OF THERMODYNAMICS **13 Hour**

Thermodynamics System – Zeroth, First, Second and Third Laws of Thermodynamics – Isothermal and Adiabatic Process – Reversible and Irreversible Process – Heat Engine – Efficiency of a Carnot's Engine – Carnot's Cycle - Carnot's Theorem - Entropy – Temperature – Entropy Diagram – Maxwell's Thermodynamic Relations – Clapeyron's Latent Heat Equation.

UNIT–IV LOW TEMPERATURE PHYSICS **13 Hour**

Introduction – Cooling by Adiabatic Expression – Joule – Thomson Expression – Liquefaction of Gases – Principle of Regenerative Cooling – Liquefaction of Helium – He I & II- Peculiar Properties of He II - Adiabatic Demagnetization – Air Conditioner – Refrigerator.

UNIT – V STATISTICAL MECHANICS **13 Hour**

Introduction – Micro and Macro States – Thermodynamic Probability – Ensembles – Derivation of Maxwell – Boltzmann Distribution Law – Application of M-B Law to Ideal Gas – Identical Particles – Derivation of Bose-Einstein Distribution Law – Application of B-E Statistics – Derivation of Fermi-Dirac Distribution Law – Applications of F-D Statistics – Comparison of Three Statistics.

Text Books

- Mathur, D.S. (2010). *Heat and Thermodynamics*. S. Chand & Company Ltd. New Delhi.
- Brij Lal, Subramaniam, Hemne, P.S. (2010). *Heat Thermodynamics and Statistical Physics*. S. Chand & Company Ltd. New Delhi.

Reference Books

- Chakrabati, P.K. (2006). *Theory and Experiments on Thermal Physics*. New Central Book Agency (P) Ltd. Kolkata.
- Rajam, J.B. and Arora, C.L. (2004). *Heat and Thermodynamics*. S. Chand & Company Ltd. New Delhi.

E – Resources

- https://www.kanchiuniv.ac.in/phy/THERMAL%20PHYSICS%20MATERIAL_KR.pdf
- http://www.fulviofrisone.com/attachments/article/485/Huang%20-%20Introduction%20to%20Statistical%20Physics,%20Taylor%20and%20Francis,%202001_305.pdf

OPTICS
UPHM205

Semester: II **Credit : 4**
Category: Major Core (DSC) – V **Hour/Week: 4**
Class: II B.Sc Physics **Total Hour: 52**

Objectives

To enable the students

- Identifying the Concepts of Dispersion, Interference, Diffraction, Polarization of Light.
- Interpret the Applications of Light in Day-to-Day Life.
- Apply the Laser Characteristics to Industry, Engineering and Medicine.

Learning Outcomes

On completion of the course, the students will be able to

- Solve Problems in Optics by Selecting the Appropriate Equations and Performing Numerical or Analytical Calculations.
- Develop the Optical Phenomenon in Various Fields.

UNIT-I GEOMETRICAL OPTICS **10 Hour**

Fermat's Principle - Dispersion of Light - Dispersive Power - Cauchy's Formula – Dispersion – Deviation without Dispersion - Dispersion without Deviation - Cardinal Points of an Optical System and their Relationships, Thick Lens and Combinations- Aberrations - Types of Aberrations - Spherical Aberration - Methods of Minimizing Spherical Aberrations - Chromatic Aberrations in Lens – Condition for Achromatism of Two Thin Lenses in Contact and Two Thin Lenses Separated – Eyepieces – Huygen's and Ramsden's Eyepieces with Comparison and its Application.

UNIT-II INTERFERENCE **11 Hour**

Introduction - Condition for Sustained Interference of Light - Young's Experiment – Theory of Interference Fringes - Fresnel's Biprism - Experimental Determination of 'λ' of Monochromatic Light and Thickness of Sheet - Colour of Thin Films – Airwedge - Experiment to Measure the Diameter of the Wire - Newton's Rings - Determination of Wavelength of Sodium Light by Newton's Rings - Determination of Refractive Index of Liquid –Michelson's Interferometer - Theory – Applications.

UNIT-III DIFFRACTION **10 Hour**

Introduction - Fresnel and Fraunhoffer Diffraction - Construction of Half-Period Zones - Zone Plate - Principle – Theory - Diffraction at a Circular Aperture - Fraunhoffer Diffraction at a Single Slit

- Plane Transmission Diffraction Grating - Dispersive Power of a Grating - Determination of Wavelength of Light using Transmission Grating (Normal Incidence).

UNIT-IV POLARISATION **11 Hour**

Polarisation of Light - Brewster's Law - Double Refraction - Nicol Prism - Quarter Wave Plate - Half Wave Plate - Production and Detection of Plane, Circularly and Elliptically Polarized Light - Optical Activity -Specific Rotation - Laurent's Half-Shade Polarimeter.

UNIT-V MODERN OPTICS **10 Hour**

Laser: Introduction - Characteristics of Laser Light- Spontaneous and Stimulated Emission-Population Inversion-Pumping - Lasing Action - Ruby Laser - He-Ne Laser – Applications - Fibre Optical Communication - Holography**.**

Text Books

- Murugeshan, R. Kiruthiga, S. (2010). *Optics and Spectroscopy*. S. Chand and Company Ltd. (7th Revised Ed.). New Delhi.
- Brijlal, N. Subramaniam, S. (2008). *A Text Book of Optics*. Chand and Company Ltd. New Delhi.

Reference Books

- Johnson, B.K. (2012). *Optics and Optical Instruments: An Introduction*. Dover Publications. Kindle Edition. (3rd Revised Ed.). New York.
- Laud, B.B. (2009). *Lasers and Non-Linear Optics*. New Age International Publishers. New Delhi.

E – Resources

- https://www.fisica.net/optica/optics_textbook.pdf
- http://www.fulviofrisone.com/attachments/article/404/Introduction%20to%20Modern%20Optics.pdf

ALLIED PHYSICS-I

UPHA102

Semester : I **Credit : 3**
Category : Allied I **Hour/Week : 3**
Class & Major :I B.Sc Chemistry **Total Hour : 39**

Objectives

To enable the students

- Gain Knowledge of basics of Particle Dynamics and Properties of Matter.
- Understand Diffraction and Polarization of Light Waves.
- Acquire Knowledge on Crystal Diffraction.

Learning Outcomes

On completion of the course, the students will be able to

- Demonstrate Knowledge and Comprehension of the Basic and Applied Fields of Physics.
- Develop Independent Problem Solving Skills.

UNIT – I PARTICLE DYNAMICS **7 Hour**

Displacement, Velocity and Acceleration – Distance-Time Graph – Velocity-Time Graph – Projectile Motion – Uniform Circular Motion – Tangential Acceleration in Circular Motion – Relative Velocity and Acceleration.

UNIT – II GRAVITATION **7 Hour**

Kepler's Laws - Newton's Law of Gravitation – 'g' and Measurement – Earth-Moon System - Earth Satellites – Parking Orbit – Earth Density – Mass of the Sun – Gravitational Potential – Velocity of Escape – Satellite Potential and Kinetic Energy.

UNIT – III PROPERTIES OF MATTER **9 Hour**

Elastic Properties: Elastic Limit – Hooke's Law – Moduli of Elasticity – Poission's Ratio – Relation between q,n,k – Force in a Bar due to Contraction or Expansion – Energy Stored in a Wire – Rigidity Modulus – Torsion in a Wire – Static Torsion and Torsional Oscillations Method.

Viscosity and Surface Tension: Newton's Formula – Stoke's Formula – Poiseuille's Flow – Molecular Theory of Surface Tension – Excess Pressure over Curved Surface – Spherical and Cylindrical Drops – Surface Energy – Capillary Rise – Quincke's Method for Mercury.

UNIT – IV OPTICS **9 Hour**

Diffraction: Fresnel and Fraunhoffer Diffractions – Fraunhoffer Diffraction at a Single Slit - Diffraction at Multiple Slits - Plane Diffraction Grating – Determination of Wavelength of a Spectral Line of a Hg Lamp.

Polarisation: Double Refraction of Crystals – Geometry of Nicol Prism – Huygen's Theory – Polaroid – Circular and Elliptical Polarization – Quarter and Half Wave Plates – Production and Analysis of Polarized Beams – Optical Activity.

UNIT – V CRYSTAL PHYSICS **7 Hour**

Crystal structures: Introduction – Crystal Lattice – Unit Cell – Classification of Crystals – Bravais Lattice in Three Dimensions –Crystal Planes and Miller Indices – Simple Crystal Structures.

Crystal diffraction: Bragg's Law – Experimental X-Ray Diffraction Methods - Laue Method – Rotating Crystal Method – Powder Method.

Text Books

- Narayanamurthy M. and Nagararathnam, N. (2004). *Dynamics*. National Publishing House. New Delhi.
- Mathur, D.S. (2012). *Properties of Matter*. S. Chand and Company. New Delhi.

Reference Books

- Halliday, D. and Resnick, R. (2006). *Fundamentals of Physics*. Wiley. (6th Ed.). New York.
- Brijlal, N. Subramaniam. *(*2008). *A Text Book of Optics*. S. Chand & Company Ltd. New Delhi.

PHYSICS FOR CHEMISTRY PRACTICAL – I

UPHR103

Semester : I **Credit : 2**
Category : Allied Practical I **Hour/Week : 3**
Class & Major : I B.Sc Chemistry **Total Hour : 39**

Objectives

To enable the students

- Understand the Theory of the Application of Subject Knowledge in Practical.
- Understand the Techniques of Handling Equipments.
- Make Error Free Measurements and Error Analysis.

Learning Outcomes

On completion of the course, the students will be able to

- Develop Experimental Technique, Including proper setup and Care of Equipment.
- Analyze Results in Order to Observe Physical Phenomena, Assess Experimental.

1. Young"s Modulus by Strenching – Vernier Microscope.
2. Rigidity Modulus – Torsional Pendulum.
3. Young"s Modulus by Non-Uniform Bending.

4. Surface Tension and Interfacial Tension – Method of Drops.
5. Surface Tension – Capillary Rise.
6. Viscosity – Capillary Flow.
7. Specific Heat of Liquid – Newton's Law of Cooling.
8. Sonometer – Verification of Laws of Vibration.
9. Compound bar Pendulum –Determination of 'g' and Radius of Gyration.
10. Specific Heat of Liquid – Electrical Heating.

Text Books

- Srinivasan, M.N. Balasubramanian, S. Ranaganathan, R. (2006). *The Text Book of Practical Physics*. Sultan Chand and Sons. New Delhi.
- Ouseph C.C. Ranagarajan, G. (1990). *A Textbook of Practical Physics Part-I*. S. Viswanathan Publisher.

Reference Book

- Gupta, S.L. and Kumar, V. (2002). *Practical Physics*. Pragathi Prakashan. (25th Ed.).

ALLIED PHYSICS -II

UPHA203

Semester : II **Credit : 3**
Category : Allied II **Hour/Week : 3**
Class & Major : I B.Sc Chemistry **Total Hour : 39**

Objectives

To enable the students

- Aware of Semiconductor Devices and their Working Principle.
- Study the Basic Number System, Digital Gates, Flip Flops, Counters and Registers.
- Acquire the Knowledge of Atom Model, Quantum Numbers and Periodic Table.

Learning Outcomes

On completion of the course, the students will be able to

- Demonstrate Knowledge and Comprehension of the Electronic Components & Application the Modern Physics.
- Know the Importance of Nucleus and Ultrasonics.

UNIT – I SEMICONDUCTOR DEVICES **8 Hour**

Semiconductor- Intrinsic and Extrinsic Semiconductor - Fermi Level-Mechanism of Current Conduction - PN - Junction Diode - Zener Diode-LED- Solar Cell - Transistor: Construction-Mechanism of Amplification- Current Components- Modes of Operation-Transistor Amplifier.

UNIT – II DIGITAL ELECTRONICS **7 Hour**

Number System- Binary – Octal-Hexadecimal-Digital Gates-Boolean Algebra – K-Map-RS-Flip Flop-JK- Flip Flop- Shift Register- Full and Half Adder-Binary Counter-Modulus Counter-Decade Counter.

UNIT –III ATOMIC PHYSICS **8 Hour**

Atomic Physics: Bohr's Atom Model- Hydrogen Spectrum-Fine Structure Splitting- Sodium Doublet-Quantum Numbers- Pauli's Exclusion Principle-Periodic Table.

X-ray and Photoelectric Effect: Production of X- Ray – Continuous and Characteristics – X-Ray Spectra – Industrial and Medical Applications of X-Rays. Law of Photoelectric Emission-Einstein's Photoelectric Equation- Millikan's Experiment-Photoelectric Cells (Emissive, Electric and Voltaic) –Photo Multiplier Tubes.

UNIT –IV NUCLEAR PHYSICS **7 Hour**

General Properties of Nuclei: Nuclear Mass and Binding Energy –BE/A versus A Curve- Nuclear Spin and Magnetic Moment- Mass, Half Life and Spin of Neutron-Semi Empirical Mass Formula- Nuclear Models and Elementary Particles – Nuclear Reactions: Cross Section- Nuclear Fission- Liquid Drop Model- Nuclear Forces-Elementary Particles: Classification- Quarks and Lepton

UNIT –V MECHANICAL WAVES **9 Hour**

Waves in Strings and Pipes: Velocity of a Transverse Wave along a Stretched String – Velocity of Sound in Gases- Newton's Formula for Velocity of Sound-Effect of Temperature, Pressure, Humidity and Density of Medium on Sound.

Ultrasonic and Acoustics: Ultrasonics - Piezo Electric Effect-Detection of Ultrasonics-Applications- Reverberation Time and Sabine's Law- Measurement of Noise – Reduction and Sound Insulations.

Text Books

- Brijlal, and Subramaniyam, (1995). *Electricity and Magnetism*. Ratan Prakash Mandir Publisher.
- Mani, H.S. Mehta. (1998). *Introduction to Modern Physics*. G.K Publication. Affiliated East-West Press Ltd. New Delhi.

Reference Books

- Richard, P. Feynman, Leighton, R.B. and Mathew S. (2005). *Feynman Lectures on Physics Series*. Vol, 1,2 and 3. Narosa Publishing. (8th Reprint). New Delhi.
- Khanna, R. and Bedi, R.S. (1985). *Text Book of Sound*. Atma Ram and Sons. New Delhi.

PHYSICS FOR CHEMISTRY PRACTICAL – II

UPHR202

Semester : I **Credit : 2**
Category : Allied Practical I **Hour/Week : 3**
Class & Major : I B.Sc Chemistry **Total Hour : 39**

Objectives:

To enable the students

- Understand the Theory of the Application of Subject Knowledge in Practical.
- Apply Techniques of Handling Equipments.
- Make Error Free Measurements and Error Analysis.

Learning Outcomes

On completion of the course, the students will be able to

- Develop Experimental Technique, Including proper setup and Care of Equipment.
- Analyze Results in Order to Observe Physical Phenomena, Assess Experimental.

1. Determination of Young's Modulus (Non-Uniform Bending) – Pin and Microscope.
2. Determination of Rigidity Modulus (Pointer Method) – Static Torsion.
3. Determination of Focal Length – Concave and Convex Lenses.
4. Determination of Thickness of Wire – Air Wedge.
5. Universal Building Block – NAND Gates.
6. Determination of Wavelengths (Grating) – Hg Spectrum.
7. LCR Parallel Resonant Circuit.

8. Characteristics of Zener Diode.
9. Construction of Half and Full Adders – Digital Gates.
10. Determination of Velocity of Sound Waves – Melde' String.

Text Books

- Srinivasan, M.N. Balasubramanian, S. Ranganathan, R. (2006). *The Text Book of Practical Physics.* Sulthan Chand & Sons. New Delhi.
- Ouseph, C.C. Rangarajan, G. (1990). *A Text Book of Practical of Physics Part – I.* S. Vishvanathan Publisher.

Reference Book

- Gupta, S.L. Kumar, V. (2002). *Practical Physics*. Pragathi Prakashan. (25th Ed.).

APPLIED PHYSICS

UPHE202

Semester: II **Credit : 2**
Category: Non Major Elective **Hour/Week: 3**
Class & Major: I UG **Total Hour : 52**

Objectives:

To enable the students

- Understand the Knowledge of Semiconductors.
- Gain the Knowledge of ICs Fabrication.
- Acquire Basics of Laser.

Learning Outcomes

On completion of the course, the students will be able to

- Demonstrate Knowledge and Comprehension of the Electronic Components & Application the Spintronics.
- Know the Importance of Semiconductor and Laser.

UNIT- I SPINTRONICS **11 Hour**

Spintronics-Introduction-Metals based Spintronic Devices-Applications-Semiconductor- Based Spintronic Devices -Applications-Spin Pumping-Spin Transfer.

UNIT-II PHOTONICS **10 Hour**

Photonics-Introduction-Photo Detectors-p-n Photo Diode-Avalanche Photo Diode-Photo Transistors-Photo Conductive Detectors.

UNIT- III SEMICONDUCTORS **11 Hour**

Semiconductors-Carrier Scattering and Mobility-Drift Current and Conductivity-Thermistors and Piezo Resistors- Thermoelectric Effect.

UNIT-IV LASER AND ITS APPLICATION **10 Hour**

LED- Laser- Optical Pumping- Population Inversion- Ruby Laser-CO_2 Laser-He-Ne Laser-Photoconductors- Solar Radiation-Thin Film Solar Cell-Superconductivity.

UNIT-V BASIC ELECTRONICS **10 Hour**

IC Fabrication- Fabrication of BJT,FET, Monolithic Diodes, Contacts IC Resistors and Capacitors, IC Packaging, Characteristic of IC Components.

Text Books

- Charles, Kittel. (2003). *Solid State Physics*. Wiley Eastern Ltd.
- Murugeshan, R. (2006). *Optics & Spectroscopy*. S. Chand & Co. New Delhi.

Reference Books

- Shur, M. (2001). *Physics of Semiconductor Devices*. PHI Publication.
- Mani, H.S. Mehta. (1998). *Introduction to Modern Physics*. G.K Publication. Affiliated East-West Press Ltd. New Delhi.

III & IV EVALUATION COMPONENTS OF CIA

Semester	Part	Category	Course Code	Course Title	Component-III	Component-IV
I	III	Major Core (DSC)–I	UPHM106	Properties of Matter	Seminar	Presentation
	III	Major Core (DSC)–II	UPHM107	Mechanics	Assignment	Assignment
II	III	Major Core (DSC)–IV	UPHM204	Thermal and Statistical Physics	Seminar	Poster
	III	Major Core (DSC)–V	UPHM205	Optics	Seminar	Working model

ALLIED COURSE

Semester	Part	Category	Course Code	Course Title	Component III	Component IV
I	III	Allied	UPHA102	Allied Physics -I	Seminar	Presentation
II	III	Allied	UPHA203	Allied Physics -II	Seminar	Presentation

NON MAJOR ELECTIVE COURSE

Semester	Part	Category	Course Code	Course Title	Component III	Component IV
II	IV	NME	UPHE202	Applied Physics	Seminar	Presentation

PROGRAMME PROFILE M.Sc., PHYSICS

PROGRAMME SPECIFIC OUTCOMES (PSO)

After two years of completion of the M.Sc., Programme, the Graduates will

- Understand the Challenges of a Dynamically and Globalised Changing World Adapting their Skills through Continuous Learning and Self-Improvement.
- Improving the Employability Skills by Facilitating Activities to Enrich the Path towards Higher Learning and Employment.
- Exposing to New Learning Methods Involving Active Learning Experience such as Learning Outside the Class Rooms, Internships, Industry/ Institutional Visits, Training Programs, etc.

Semester	Category	Course Code	Course Title	Previous Course Code	Contact Hrs/Week	Credit Min/ Max
I	Core I	PPHM101	Mathematical Physics I	-	6	5
	Core II	PPHM107	Classical Mechanics	PPHM102	7	6
	Core III	PPHM105	Electronics	-	6	4
	Core IV	PPHM106	Molecular Spectroscopy	PPHM203	6	5
	Core V	PPHR101	General Practical – I	-	5	3
				Total	**30**	**23**
II	Core VI	PPHM205	Mathematical Physics II	PPHM401	5	4
	Core VII	PPHM201	Quantum Mechanics I	-	5	5
	Core VIII	PPHM208	Electromagnetic Theory	PPHM104	5	3
	Core IX	PPHM207	Solid State Physics I	PPHM302	5	3
	Core X	PPHR203	Electronics Practical	-	5	3
	NME	PPHE201	Nanoscience	PPHE101	5	4
	Service Learning	PPHX201	Energy Audit	-	-	1
	Extra Credit	PPHS201	Spoken Tutorial / NPTEL	-	-	-/2
				Total	**30**	**23/25**
III	Core XI	PPHM301	Quantum Mechanics II	-	5	5
	Core XII	PPHM306	Crystal Growth and its Technology	-	4	3
	Core XIII	PPHM307	Statistical Mechanics	PPHM202	4	4
	Core XIV	PPHP301	Project	-	2	-
	Core XV	PRMC301	Research Methodology	-	5	4
	Core XVI	PPHR303	Numerical Practical – III	-	5	3
	Core XVII	PIDM301	Sustainable Materials and Technologies	-	5	5
				Total	**30**	**24**
IV	Core XVIII	PPHM406	Laser and Nonlinear Optics	PPHM303	6	4
	Core XIX	PPHM402	Nuclear and Particle Physics	-	7	4
	Core XX	PPHM403	Solid State Physics-II	-	7	4
	Core XXI	PPHM407	Microprocessor and Microcontroller	PPHM302	6	4
		PPHP401	Project	-	4	4
				Total	**30**	**20**
				GRAND TOTAL	**120**	**90/92**

EXTRA CREDIT EARNING PROVISION

Semester	Part	Category	Course Code	Course Title	Hour per Week	Credits (Min/Max)
II	III	Core	PPHI201	Internship	-	1
IV	III	Core	PPHI401	Internship	-	1

MATHEMATICAL PHYSICS-I

PPHM101

Semester : I **Credit : 5**
Category : Core I **Hour/Weeks : 6**
Class & Major : I M.Sc., Physics **Total Hour : 65**

Objectives:

To enable the students

- Acquire Mathematical Knowledge and Apply it to various Physical Phenomena.
- Develop Problem Solving Ability related to Physical Problems.
- Enhance basic Skills of Learning and Appreciating Physics through Mathematics.

Learning Outcomes

On completion of the course, the students will be able to

- Apply the concepts of Calculus, Vector Analysis, Vector Calculus, Fourier Series, Special Functions.
- Solve various Physics Problems using Mathematical Techniques.

UNIT – I VECTOR ANALYSIS **13 Hour**

Concept of Vector and Scalar Fields – Gradient, Divergence, Curl and Laplacian – Vector Identities – Line Integral, Surface Integral and Volume Integral – Gauss Theorem, Green's Theorem, Stoke's Theorem and Applications – Orthogonal Curvilinear Coordinates – Expression for Gradient, Divergence, Curl and Laplacian in Cylindrical and Spherical Co-ordinates - Definitions – Linear Independence of Vectors – Schmidt's Orthogonalisation Process – Schwartz Inequality.

UNIT – II COMPLEX ANALYSIS **12 Hour**

Functions of Complex Variables – Differentiability - Cauchy-Riemann Conditions – Complex Integration – Cauchy's Integral Theorem and Integral Formula – Taylor's and Laurent's Series – Residues and Singularities - Cauchy's Residue Theorem – Evaluation of Definite Integrals - Derivatives of Analytic Functions -Calculus of Residues.

UNIT – III FOURIER SERIES AND LAPLACE TRANSFORMS **13 Hour**

Fourier Series-Dirichlet's Theorem-Change of Interval-Complex Form-Fourier Series in the Interval $(0, \infty)$ - Uses of Fourier Series-Laplace Transform-Definition-Properties-Translation Property-Inverse Laplace Transform-Properties, Example Problems.

UNIT – IV PARTIAL DIFFERENTIAL EQUATIONS **14 Hour**

Homogeneous and Non-Homogeneous Equations of First and Second Order Partial Differential Equations Separation of Variables Technique-Solution by Fourier Series-Use of Double Fourier Series. Applications: (1) One dimensional Wave Equation (2) One Dimensional Heat Flow Equation (Separation of Variables and Use of Fourier Series) (3) Two Dimensional Laplace's Equation in Cartesian Coordinate (Separation of Variables and Double Fourier Series.)

UNIT – V SPECIAL FUNCTIONS **13 Hour**

Sturm-Liouville Problem – Orthogonal Functions - Legendre, Associated Legendre, Bessel, Laugerre and Hermite Differential Equations: Series Solution – Rodriguez Formula – Generating Functions – Orthogonality Relations – Important Recurrence Relations- Gamma and Beta Functions.

Text Books

- Erwin Kreyzig. (2005). *Advanced Engineering Mathematics*. Publishers-John Wiley & Sons. Inc. (8^{th} Ed.).
- Joshi, A.W. (1997). *Group Theory for Physicists.* Wiley Eastern Limited. (2^{nd} Ed.).
- Spiegel, M.R. (2000). *Theory and Problems of Fourier Analysis*. Schaum's Outline Series.

Reference Books

- Murray R. Spiegel. (2000). *Theory and Problems of Fourier Analysis with Applications to Boundary Value Problems.* Mchraw Hill Book Company.
- Sankara Rao K. (2005). *Introduction to Partial Differential Equations.* Prentice Hall of India. (2nd Ed.).
- Greenberg, M.D. (2002). *Advanced Engineering Mathematics.* Publishers-Pearson Education (Singapore). Pvt. Ltd. (2nd Ed).

CLASSICAL MECHANICS

PPHM107

Semester : I **Credit:6**
Category : Core II **Hour/Weeks: 7**
Class & Major : I M.Sc., Physics **Total Hour : 65**

Objectives:

To enable the students

- Understand the Drawbacks of Newtonian Approach and Necessity of New Approaches to Solve Advanced Problems Involving the Dynamic Motion of Classical Mechanical Systems.
- Apply the Basic Concept in Nonlinear Dynamics.

Learning Outcomes

On completion of the course, the students will be able to

- Solve the Lagrangian Dynamics, Hamiltonian Mechanics, Lorentz Transformations, Special Theory of Relativity and Nonlinear Dynamical Problems.
- Create the Necessary Mathematical Equations.

UNIT – I FUNDAMENTAL PRINCIPLES AND MATHEMATICAL FORMULATION 13 Hour

Mechanics of a Particle and System of Particles – Conservation Laws – Constraints – Generalized Coordinates – D' Alembert's Principle and Lagrange's Equation – Hamilton's Principle – Lagrange's Equation of Motion – Conservation Theorems and Symmetry Properties – Motion Under Central Force : General Features.

UNIT – II LAGRANGIAN AND HAMILTONIAN FORMULATIONS 14 Hour

Hamilton's Variational Principle - Lagrange's Equations of Motion –Conservation Theorems and Symmetry Properties – Cyclic Coordinates - Application of Lagrange's Equation - Linear Harmonic Oscillator, Particle Moving under a Central Force, Atwood's Machine - Hamilton's Equations of Motion - Application of Hamiltonian's Equations of Motion - Particle Moving in an Electromagnetic Field - Phase Space - Principle of Least Action Lagrange and Poisson Brackets – Hamilton – Jacobi Method – Action Angle Variables – Kepler Problem in Action – Angle Variables.

UNIT - III RIGID BODY DYNAMICS AND OSCILLATORY MOTION 12 Hour

Euler Angles – Moments and Products of Inertia – Euler's Equations – Symmetrical Top – Applications – Theory of Small Oscillations and Normal Modes – Frequencies of Free Vibration and Normal Coordinates – Linear Triatomic Molecule.

UNIT - IV RELATIVISTIC MECHANICS 12 Hour

Algebra of Tensors – Quotient Law – Fundamental Tensor – Cartesian Tensors – Four Vectors in Special Theory of Relativity – Lorentz Transformations in Real Four Dimensional Spaces, Covariant Four Dimensional Formulations – Force and Energy Equations in Relativistic Mechanics – Lagrangian and Hamiltonian Formulation of Relativistic Mechanics.

UNIT - V NONLINEAR DYNAMICS **14 Hour**

Linear and Nonlinear Systems– Linear Superposition Principle – Linear Wave Propagation (Non Dispersive and Dispersive) –Fourier Transform and Solution of Initial Value Problem– Wave Packet and Dispersion–Nonlinear Dynamical Systems – Korteweg-de Vries Equation and the Solitary Waves and Cnoidal Waves– Hirota's Direct Method and N Soliton Solution – Introduction to Chaos.

Text Books

- Goldstein, H. Poole, C. Safko, J. (2002). *Classical Mechanics.* Addison Wesley. New Delhi.
- Lakshmanan, M. and Rajasekar, S. (2003). *Nonlinear Dynamics, Integrability, Chaos and Patterns*. Springer.

Reference Books

- Gupta, Kumar, Sharma, (2002). *Classical Mechanics.* Pragati Bhawan. Meerut. *(*22nd Ed.).
- Awrejcewicz, J.A. (2016). *Applied Nonlinear Dynamical Systems*: 93. Springer. (1st Ed.).

E – Resources

- https://www.physics.upenn.edu/sites/default/files/Classical_Mechanics_a_Critical_Introduction_0_0.pdf
- http://www.fulviofrisone.com/attachments/article/464/Strogatz,%20S.H.%20-%20Nonlinear%20dynamics%20and%20chaos.pdf

ELECTRONICS

PPHM105

Semester : I **Credit: 4**
Category : Core III **Hour/Weeks : 6**
Class & Major: I M.Sc., Physics **Total Hour : 65**

Objectives:

To enable the students

- Remember the Basic and Advanced Electronic Concepts.
- Understand how to Design Circuits which can Process Digital Data.
- Establish the various Principles of Analog Electronics and its Applications.

Learning Outcomes

On completion of the course, the students will be able to

- Recognise a variety of Exciting High-Tech Products and Systems Enabled by Electronics.
- Manipulate Voltages, Currents and Resistances in Electronic Circuits.
- Demonstrate Familiarity with Basic Electronic Components and Use them to Design Simple Electronic Circuits.

UNIT – I OPERATIONAL AMPLIFIERS **13 Hour**

Ideal Op-Amp-Inverting, Non-Inverting, Logarithmic, Summing and Difference Amplifiers-Integrator - Differentiator- Comparator-CMRR – Op-Amp Applications- Summing Amplifiers-Application of Summing Amplifiers.

UNIT – II UJTS AND THYRISTORS **14 Hour**

Operational Principle of UJT- Characteristics- SCR- V-I Characteristics –TRIAC- Thyristors: Basic Parameters- Current Controllable Devices- Thyristors in Series and Parallel- Applications of Thyristors - TRIAC based AC Power Control - Bistable Multivibrator, Half and Full Wave Controlled Rectifier.

UNIT – III DIGITAL INTEGRATED CIRCUITS **12 Hour**

7400 TTL- TTL Parameters; TTL-MOSFET - CMOS FET - Three State TTL Devices-External Drive for TTL Loads - TTL Driving External Loads-74C00 CMOS- CMOS Characteristics-TTL to CMOS Interface- CMOS to TTL Interface- Current Tracers.

UNIT – IV ANALOG INTEGRATED CIRCUITS **13 Hour**

Electronic Analog Computation- Active Filters- High/Low Pass Filter-Band Pass Filter-Band Reject Filter- Delay Equalizer- Switched Capacitor Filters; Comparators- Sample and Hold Circuits-Waveform Generators- Square Wave Generator- Triangle Wave Generator-Sawtooth Generator.

UNIT-V INTEGRATED CIRCUITS AS DIGITAL SYSTEM **13 Hour**

Binary Adders- Half / Full Adder- - MSI Adder-Serial/Parallel Operation-Decoder/Demultiplexer- BCD to Decimal Decoder-4-to-16 line Demultiplexer- Data Selector/Multiplexer-16-to-1 Multiplexer; Encoder; ROM: Code Converters-Programming the ROM-Applications-Basic RAM Elements-Bipolar RAM-Static and Dynamic MOS RAM- Ladder Type D/A Converter-Multiplying D/A Converter.

Text Books

- Chattopadhyay, S. (2006). *Text Book of Electronics*. New Central Book Agency P.Ltd. Kolkata.
- Malvino, A.P. Leach, D.P. (2005). *Digital Principles and Applications*. Tata McGraw-Hill. Publishing Co. New Delhi.

Reference Books

- Bhattacharya, A.B. (2007). *Electronics Principles and Applications*. New Central Book Agency P.Ltd. Kolkata.
- Jacob Millman, Christos C Halkins and Chetan Parikh. (2010). *Integrated Electronics Analog and Digital Circuits and Systems*. Tata McGraw Hill Educatio Private Ltd. New Delhi.
- Anil K. Maini and Varsha Agarwal. (2009). *Electronic Devices and Circuits*. Wiley India Pvt. Ltd. New Delhi.

MOLECULAR SPECTROSCOPY

PPHM106

Semester : I **Credit: 5**
Category : Core V **Hour/Weeks : 6**
Class & Major : I M.Sc., Physics **Total Hour : 65**

Objectives:

To enable the students

- Acquire the Knowledge of Interaction Electromagnetic Radiation with Atoms and Molecules and Study the Different Types of Spectra.
- Know the Spectroscopic Techniques to use in finding the Molecular Structure, Bond Angles, Bond Length etc.
- Analyze the Use of Spectroscopic Methods for Qualitative and Quantitative.

Learning Outcomes

On completion of the course, the students will be able to

- Describe the Desirable Features of a Radiation Source.
- Able to Analyze Results of Measurements using Molecular Spectroscopy Methods.

UNIT – I MICROWAVE SPECTROSCOPY **13 Hour**

Rotation of Molecules-Rotational Spectra-Rigid and Non-Rigid Diatomic Rotator-Intensity of Spectral Lines-Isotopic Substitution-Poly Atomic Molecules (Linear and Symmetric Top)-Hyperfine Structure and Quadrupole Effects-Inversion Spectrum of Ammonia-Chemical Analysis by Microwave Spectroscopy-Techniques and Instrumentation.

UNIT – II VIBRATIONAL SPECTROSCOPY **14 Hour**

Infrared spectroscopy-Vibration of Molecules-Diatomic Vibrating Rotator-Vibrational Rotational Spectrum-Interactions of Rotations and Vibrations-Influence of Rotation on the Vibrational Spectrum of Linear and Symmetric Top and Poly Atomic Molecules-Analysis by Infrared Techniques-Instrumentation-FTIR Spectroscopy -Raman Spectroscopy: Classical and Quantum Mechanical Picture of Raman Effect-Pure Rotational Raman Spectrum -Raman Activity of Vibrations of CO_2 and H_2O Rule of Mutual Exclusion- Vibrations of Spherical Top Molecule-Structural Determination from IR and Raman Spectroscopy Techniques and Instrumentation-FT Raman Spectroscopy

UNIT – III ELECTRONIC SPECTROSCOPY **12 Hour**

Electronic Spectra-Frank-Condon Principle-Dissociation Energy and Dissociation Products-Fortrat Diagram- Predissociation-Shapes of some Molecular Orbits- Chemical Analysis by Electronic Spectroscopy-Techniques and Instrumentation-Mass Spectroscopy-ESR Spectroscopy-Introduction-Techniques and Instrumentation-Double Resonance.

UNIT – IV NUCLEAR RESONANCE SPECTROSCOPY **13 Hour**

Nuclear Magnetic Resonance Spectroscopy-Introduction-Interaction of Spin and Magnetic Field-Population of Energy Levels- Larmor Precession-Relaxation Times-Chemical Shift and its Measurement-Coupling Constant-Coupling between Several Nuclei-Quadrupole effects-C^{13} NMR Spectroscopy-Mossbauer Spectroscopy: Principle-Instrumentation-Effect of Electric and Magnetic Fields.

UNIT - V SURFACE SPECTROSCOPY **13 Hour**

Electron Energy Loss Spectroscopy (EELS)-Reflection Absorption Spectroscopy (RAIRS)-Photoelectron Spectroscopy (PES)- XPES, UPES-Auger Electron Spectroscopy (AES) X-Ray Fluorescence Spectroscopy (XRF)-SIMS.

Text Book

- Colin N. Banwell and Elaine M. (2013). *Fundamentals of Molecular Spectroscopy.* Tata McGraw-Hill Publishing Company Ltd. (5^{th} Ed.).

Reference Book

- Jack D. Graybeal. (2014). *Molecular Spectroscopy*. Mc Graw Hill Education.

PRACTICALS

GENERAL PRACTICAL

PPHR101

Semester : I **Credit: 3**
Category : Core V **Hour/Week : 5**
Class & Major : I M.Sc., Physics

Objectives:

To enable the students

- Understand the Theory of the Application of Subject Knowledge in Practical.
- Analyze the Techniques of Handling Equipments.

Learning Outcomes

On completion of the course, the students will be able to

- Analyze the Effects of Refractive Index of a Medium using Optical Instruments.
- Make Error Free Measurements and Error Analysis

1. Determination of q, n, b by Elliptical Fringes Method.
2. Determination of Planck's Constant.

3. Determination of Stefan's Constant.
4. Dielectric Constant of Material to Study the Susceptibility of Material.
5. Determination of Velocity of given Liquid using Ultrasonic Interferometer.
6. Demonstration of Hall Coefficient.
7. Determination of Laser Beam Parameter.
8. Spectrometer i-i' Curve.
9. Determination of Refractive Index of Liquids using Biprism (by Scale & Telescope method).
10. Determination of Wavelength of Monochromatic Source using Biprism.

Text Books

- Balasubramanian, S. Ranganathan, R. Srinivasan, M.N. (2019). *A Text Book of Practical Physics*. Sultan Chand and Sons. New Delhi.
- Arora, C.L. (2010). *Practical Physics*. S. Chand. Kindly. India.

Reference Book

- Gupta, S.L. and Kumar, V. (2017). *Practical Physics*. Pragathi Prakashan. (24th Ed.,).

E – Resources

- https://www.msuniv.ac.in/Download/Pdf/b2efcbdbc4be452
- https://blog.acadly.com/h-c-verma-the-man-who-taught-india-physics-b8fc4ed24d7d

MATHEMATICAL PHYSICS-II

PPHM205

Semester : II **Credit : 4**
Category : Core VI **Hour/Weeks : 5**
Class & Major: II M.Sc., Physics **Total Hour : 65**

Objectives:

To enable the students

- Understand the various Mathematical Representations.
- Acquire Knowledge about the Tensor Analysis.
- Formulate the Greens Function and Probability

Learning Outcomes

On completion of the course, the students will be able to

- Apply the concepts of Probability, Matix, Group Theory, Tensor Analysis and Greens Function.
- Solve various Physics Problems using Mathematical Techniques.

UNIT- I PROBABILITY **13 Hour**

Probability - Addition rule of Probability - Multiplication Law of Probability - Probability Distributions - Binomial distribution - Mean Binomial Distribution - Standard Deviation of Binomial Distribution - Poisson Distribution - Normal Distribution - Characteristics of Normal Distribution - Applications of Normal Distribution.

UNIT- II APPLICATION IN MATRICES AND DETERMINANTS **13 Hour**

Properties of Matrix Addition and Multiplication – Different type of Matrices and their Properties – Rank of a Matrix and some of its Theorems – Solution to Linear Homogeneous and Non-Homogeneous Equations – Cramer's Rule – Eigenvalues and Eigenvectors of Matrices – Differentiation and Integration of Matrix.

UNIT - III ROLE OF GROUP THEORY IN PHYSICS **13 Hour**

Definition of Group – Subgroup Invariant Group Abelian Group Orthogonal and Unitary Groups - Homomorphism, Isomorphism - Reducible and Irreducible Representations -Generators of Continuous Groups.

UNIT – IV TENSOR ANALYSIS **13 Hour**

Definition of Tensor – Coordinate Transformation - Summation Convention - Contravariant, Covariant and Mixed Tensors – Rank of Tensor – Addition and Subtraction of Tensors –Symmetry and antisymmetry Tensor – Contraction of Tensor – Product Rule and Quotient Rule- Invariant Tensors – Kronecker delta and Levi-Civita Symbol - Irreducible Tensors.

UNIT –V GREEN'S FUNCTIONS **13 Hour**

Green's Function - One Dimensional Green Function – Boundary Conditions – Eigen Function - Expansion of the Green's Function- Reciprocity Theorem – Sturm Liouville Type Equations in One Dimension and their Green's Functions.

Text Books

- Arfken, Weber. (2012). *Mathematical Methods for Physicists.* - Elsevier (7th Ed.). US.
- Joglekar, S.D. (2005). *Mathematical Physics.* Universities Press Pvt. Ltd. (1st Ed.). Hydrabad.
- Satya Prakash. (2014). *Mathematical Physics*. Sultan Chand & Sons. (6th Revised Ed.). New Delhi.

Reference Books

- Dass, H.K. and Verma, R. (2011). *Mathematical Physics*. S. Chand & Company. (4th Ed.).
- Erwin Kreyszig. (2010). *Advanced Engineering Mathematics*, Wiley Eastern, (10th Ed.).
- Gupta, B.D. (2006). *Mathematical Physics*. Vikas Publishing House Pvt. Ltd. (3rd Ed.).
- Joshi, A.W. (2010). *Elements of Group Theory of Physicists*. Wiley Eastern Ltd.

QUANTUM MECHANICS I

PPHM201

Semester : II **Credit : 5**
Category : Core VII **Hour/Weeks : 5**
Class & Major: I M.Sc., Physics **Total Hour : 65**

Objectives

To enable the students

- Understand basic Idea of Dirac Formalism to Quantum Mechanics.
- Apply the same Formalism to study the Angular Momentum Concept, Scattering of Fundamental Particles and Necessary Relativistic Modification in Particle Behavior.
- Analyze the Similarities between Classical and Quantum Mechanics.

Learning Outcomes

On completion of the course, the students will be able to

- Develop the Model a given Problem such as Particle in a Box, Hydrogen Atom, Hydrogen Atom in Electric Fields.
- Evaluate different Quantum Systems in Atomic and Nuclear Physics.

UNIT – I SCHRÖDINGER EQUATION AND GENERAL FORMULATION **14 Hour**

Schrödinger Equation – Physical Meaning and Conditions on the Wave Function – Expectation Values and Ehrenfest's Theorem – Hermitian Operators and their Properties – Commutator Relations - Uncertainty Relation - Bra and Ket Vectors - Hilbert Space – Schrödinger, Heisenberg and Interaction Pictures. Linear Vector Space- Linear Operator- Eigen Functions and Eigen Values- Postulates of Quantum Mechanics- Simultaneous Measurability of Observables - Dirac's Notation- Equations of Motion; Schrodinger, Heisenberg and Dirac Representation- Momentum Representation.

UNIT – II QUANTUM MECHANICS IN THREE DIMENSION **12 Hour**

Schrodinger Equation in Spherical Co-Ordination- Separation of Variable-Angular Equation- Hydrogen Atom- Radial Wave equation- Spectrum of Hydrogen.

UNIT - III ANGULAR MOMENTUM **13 Hour**

The Angular Momentum Operator – Eigenvalues and Eigen Functions of L_2 – The Commutation Relations – Angular Momentum and Rotations – Ladder Operators – the Constants C+ and C- Angular Momentum Matrices Corresponding to j = ½ and j = ½ - Pauli Spin Matrices – Pauli Wave Function and Pauli Equation – Addition of Angular Momenta – Clebsh – Gordan Coefficients – concept of Isospin.

UNIT – IV APPROXIMATION METHODS **13 Hour**

Time Independent Perturbation Theory: Non-Degenerate and Degenerate Perturbation Theories -Stark Effect – WKB Approximation- Application to Tunneling Problem and Quantization Rules. Time Dependent Perturbation Theory: Harmonic Perturbation - Transition Probability.

UNIT – V RELATIVISTIC WAVE EQUATIONS **13 Hour**

The Klein – Gordan Equation – Dirac Equation – Dirac's a and b Matrices – Continuity Equation – Free Particle Solutions– Hole Theory – Spin of the Dirac Electron – Magnetic Dipole Moment of the Electron – Velocity Operator – Expectation Value of the Velocity – Relativistic Invariance of Dirac Equation.

Text Books

- Griffths. (2005). *Quantum Mechanics.* Dorling Kindersley India (Pvt). (2nd Ed.). New Delhi.
- Ghatak and Lokanathan, S. (2005). *Quantum Mechanics*. Macmillam India Ltd. New Delhi.
- Devanathan, V. (2006). *Quantum Mechanics*. Narosa Publishing House. New Delhi.

Reference Book

- Ajoy Ghatak, Lokanathan, S. (2013). *Quantum Mechanics*. Macmillan Publishers India Ltd. (5th Ed.).

SOLID STATE PHYSICS -I

PPHM207

Semester : II **Credit : 3**
Category : Core IX **Hour/Week : 5**
Class and Major: I M.Sc., Physics **Total Hour : 65**

Objectives:

To enable the students

- Understanding of the Structural aspects and Physical Properties of Condensed Matter.
- Describe basic Experimental Measurements, to show typical Data Sets and to Compare these with Theory.
- Evaluate about Nature of the Materials.

Learning Outcomes

On completion of the course, the students will be able to

- Able to Differentiate Crystal Structure and its Properties based on the Insulators, Conductors and Semiconductors.
- Analyze the concepts of Fermi Surface in different Materials.

UNIT- I CRYSTAL STRUCTURE **13 Hour**

Crystal Classes and Symmetry – 2D, 3D Lattices - Ewald's Sphere Construction – Bragg's Law – Systematic Absences – Atomic Scattering Factor – Diffraction – Structure Factor – Experimental Techniques – Laue, Powder, Rotation Methods – Phase Problem – Electron Density Distribution (Elementary Ideas Only).

UNIT -II LATTICE VIBRATION AND THERMAL PROPERTIES **13 Hour**

Dynamics of a Chain of Identical Atoms - Dynamics of a Diatomic Linear Chain Anharmonicity and Thermal Expansion-Thermal Conductivity-Phonon-Phonon Interaction-Normal and Umklapp Processes Heat Capacity-Density of Phonon States-Dulong Pities' Law – Einstein Specific Heat- Debye's Model of Specific Heat.

UNIT - III ELECTRON THEORY OF METALS **13 Hour**

Electron Moving in a One - Dimensional Well - Density of States in Three Dimension - Fermi-Dirac Statistics - Effect of Temperature on Fermi Distribution Function - Electronic Heat Capacity-Electrical Resistivity - Ohm's Law-Widemann - Franz Law-Hall Effect.

UNIT- IV FREE ELECTRON THEORY **13 Hour**

Bloch's Theorem-Kronig - Penney Model-Construction of Brillouin Zones-Extended, Reduced and Periodic Zone Schemes - Effective Mass of an Electron-Nearly Free Electron Model-Conductors, Semiconductors and Insulator.

UNIT- V FERMI SURFACE **13 Hour**

Fermi Surface and Brilloiun Zones - Harrison's Method of Constructing Fermi Surface in 2D Electron, Hole and Open Orbits - Characteristics of Fermi Surface - Effects of Electric Field on the Fermi Surface - Effect of Magnetic Field on the Fermi Surface - Quantization of Electron Orbits-Experimental Study of Fermi Surface.

Text Books

- Wahab, M.A. (2005). *Solid State Physics, Structure and Properties of Materials*. (2nd Ed.). Narosa Publishing House.
- Puri, R.K. and Babbar, V.K. (2005). *Solid State Physics*. S. Chand and Company Ltd. (3rd Ed.).
- Palanisamy, P.K. (2003). *Solid State Physics*. Scitech Publications Ltd. India.

Reference Books

- Kittel, C. (2008). *Introduction to Solid State Physics.* Wiley Eastern Ltd. (7th Ed.).
- Ajay Kumar Saxena. (2006). *Solid State Physics.* MacMillan Publishers.

ELECTROMAGNETIC THEORY

PPHM208

Semester : I **Credit : 3**
Category : Core IV **Hour/Weeks : 5**
Class & Major : I M.Sc., Physics **Total Hour : 65**

Objectives:

To enable the students

- Understand the Law and their Applications Associated with Electrostatics and Magneto Statics.
- Explain the Laws Associated with Electromagnetic and its Applications.
- Compare the Production of Electromagnetic Waves and its Propagation in Different Media.

Learning Outcomes

On completion of the course, the students will be able to

- Apply Electrostatic Concepts in Plasma Physics.
- Analyze various Laws in Electricity and Magnetism.

UNIT – I ELECTROSTATICS **13 Hour**

Coloumb's Law- Electric Field- Continuous Charge Distribution- Gauss Law and its Application –Electric Potential-Poisson & Laplace Equations- Boundary Value Problems- Dielectrics-Polarization and Displacement Vectors-Boundary Conditions-Dielectric Sphere in a Uniform Field-Molecular Polarisability and Electric Susceptibility.

UNIT – II MAGNETOSTATICS **12 Hour**

Biot-Savart's Law-Divergence and Curl of Magnetic Induction-Magnetic Vector Potential-Ampere's Circuital Law-Ampere's Law in Magnetized Materials-Effect of Magnetic Field in Atomic Orbits –Magnetic Field Inside Matter-Linear and Nonlinear Media-Magnetic Susceptibility and Permeability.

UNIT – III ELECTRODYNAMICS **14 Hour**

Electromotive Force-Ohms Law- Faradays Law-Electromagnetic Induction- Maxwell's Equations in Free Space and Linear Isotropic Media- -Magnetic Charge-Maxwell Equations in Matter-Boundary Conditions- Conservation Laws – Conservation of Energy – Poynting's Theorem - Conservation of Momentum-Scalar and Vector Potentials- Gauge Invariance-Dynamics of Charged Particles in Static and Uniform Electromagnetic Fields.

UNIT – IV WAVE PROPAGATION **13 Hour**

Electromagnetic Waves in Free Space- Reflection and Refraction, Fresnel's Law, Interference, Coherence, and Diffraction Non-Conducting Medium-Conducting Medium-Skin Depth-Reflection and Transmission at Dielectric Boundaries-Polarization-Guided Waves-Wave Guides-Propagation of Waves in a Rectangular Wave Guide-Inhomogeneous Wave Equation and Retarded Potentials-Radiation- from Moving Charges and Dipoles and Retarded Potentials.

UNIT – V APPLICATIONS – PLASMA PHYSICS **13 Hour**

Plasma – Plasma Criteria – Plasma Oscillations-Plasma Behavior in a Magnetic Field-Dispersion Relations in Plasma. Debye Shielding Problem- Plasma Confinement in a Magnetic Field-Pinch Effect- Magneto Hydrodynamic Waves- Alfven Waves.

Text Books

- David J. Griffiths. (1995). *Introduction to Electrodynamics*. Prentice Hall of India. New Delhi.
- Laud, B.B. (2005). *Electromagnetics*. New Age International Pvt. Ltd. New Delhi.
- Chopra and Agarwal. (2005). *Electromagnetic Theory*. Kadernath and Ramnath & Co. Meerut.
- Sathya Prakash. (2007). *Electromagnetic Theory and Electrodynamics*. Kadernath Ramnath & Co. Meerut.

Reference Books

- Jackson, J.D. (1998). *Classical Electrodynamics.* Wiley Eastern.
- Balmain, K.G. (1995). *Electromagnetic Waves and Radiating System*. Prentice Hall of India.
- Edward C. Jordan, Keith G. Balmain. (2001). *Electromagnetic Waves and Radiating System*. (2nd Ed.). Prentice Hall of India. New Delhi.

ELECTRONICS PRACTICAL
PPHR203

Semester : II **Credit : 3**
Category : Core X **Hour/Week : 5**
Class & Major : I M.Sc., Physics

Objectives:
To enable the students

- Gain Knowledge on the Applications of Operational Amplifier such as Differentiator, Integrator, Astable Multivibrator and Monostable Multivibrator.
- Understand the Techniques of Handling Equipment's

Learning Outcomes
On completion of the course, the students will be able to

- Effectively Engage in Electronics Experiments using PN Junction Diode, Zener Diode, Transistor and Integrated Circuits and Execute Computer Programs in Physical Science Problems.
- Design and Practice related Experiments and Acquire Data in order to Explore Electronic Principles, Effectively Communicate Results, and Critically Evaluate related Scientific Studies.

1. Design and Study of Wein Bridge Oscillator (Op-amp).
2. Study the Function of Decoder and Encoder.
3. OP-Amp Addition and Subtraction.
4. Op-Amp Inverting and Non-Inverting.
5. IC 555 Timer Astable Multivibrator.
6. IC 555 Timer Monostable Multivibrator.
7. Digital Comparator using NAND and EX-OR Gate.
8. Bridge Rectifier.
9. BCD to Seven Segment Display using 7447.
10. Study of Counter using IC 7490.

Text Book

- Mittal, A.K. (2016). *Electronics Practical*. Computech Publications. (1st Ed.). India.
- Balasubramanian, S. Ranganathan, R. Srinivasan, M.N. (2019). *A Text Book of Practical Physics*. Sultan Chand and Sons. New Delhi.

Reference Book

- Gupta, S.L. and Kumar, V. (2017). *Practical Physics*. Pragathi Prakashan. (24th Ed.). New Delhi.

E – Resources

- https://www.niser.ac.in/sps/sites/default/files/basic_page/P242_Basic_Electronics_Lab.pdf
- https://gnindia.dronacharya.info/ECE/Downloads/Labmanuals/IC_Lab_Manual.pdf

ENERGY AUDIT

PHYX201

Semester : II **Credit : 1**
Category : PG Service Learning **Total Hour : 40**
Class & Major: M. Sc Physics

Objectives:
To enable the students

- Understand about the Energy audit and its Measurements.
- Acquire the Knowledge about the Practical Auditing Methodology.
- Interpret the Power Optimization.

INTRODUCTION TO ELECTRICAL POWER AND ELECTRICITY

Electrical Parameters - Definitions - Resistive, Inductive, Capacitive Loads - Active Power - Reactive Power - Apparent Power - Power Factor - Linear and Non-Linear Loads – Electricity Demand (kVA/kW) Calculation - Electricity Tariff.

ELECTRICAL DISTRIBUTION SYSTEM

HT Supply – Control - Distribution Transformer - Power Control Centre (PCC) Captive Generator - Power Cables - Motors - LT Power Capacitors - Lighting – UPS - Servo Stabilizer - Electrical Measuring Instruments - Importance of Measurements - Types of Meters - Instantaneous Measuring Meter.

Activity

Purpose: To Gain the Basic Knowledge and Understanding about Audit the Energy for Electrical Consumption.

1. To Study and Analyze the Power Utilization for the given Building Area/Room.
2. To Measure and Calculate the Voltage/Current of an Available Electrical System (Lights and Fans) and Equipments.
3. To Analyze the Power Utilization and Make the Strategy for Power Consumption in the Electrical Items.
4. To Submit the Detailed Report with the Conclusion Made during the Audit.

Text Books

- Muthuvelan, M. Balasubramanian, H. (2012). *A Practical Guide to Reactive Power Management in Industry*. SITRA Publication. Coimbatore.
- Wayne, C. Turner. (1997). *Energy Management Handbook*. The Fairmount Press. Inc.

Reference Books

- Francisco, C.DE LA ROSA. (2010). *Harmonics and Power Systems*. Indian Edition. CRC Press.
- Ramasamy, Natarajan. (2010). *Power System Capacitors*. Indian Edition, CRC Press.

NANOSCIENCE

PPHE201

Semester : II **Credit : 4**
Category : Non-Major Elective **Hour/Weeks : 5**
Class & Major: I PG **Total Hour : 65**

Objectives

To enable the students

- Introduce the Developing Field of Nanoscience and Technology.
- Special Focus on the Methods of Synthesis, Characterization Techniques and Applications.

Learning Outcomes

On completion of the course, the students will be able to

- Synthesize Nanoparticles by different Chemical Routs and Characterize them in the Laboratory.
- Characterization of Nanostructured Materials using X-Ray Diffraction, Electron Microscopy, Atomic Force Microscopy and Scanning Tunneling Microscopy.

UNIT – I FUNDAMENTALS OF NANOSCALE SCIENCE **13 Hour**

Introduction-Nano and Nature-Background to Nanotechnology-Scientific Revolutions Opportunities at the Nanoscale-Time and Length Scale in Structures-Energy Landscapes Basic Intermolecular Forces Inter Dynamic Aspects of Intermolecular Forces.

UNIT – II CLASSIFICATION OF NANOPARTICLES AND ITS PROPERTIES **14 Hour**

Metal Nanoparticles: Size Control of Metal Nanoparticles, Structural, Surface, Electronic and Optical Properties. Semiconductor Nanoparticles: Solid State Phase Transformation, Excitons, Quantum Confinement Effect, Semiconductor Quantum Dots (SQDs), Correlation of Properties with Size, Quantum Well, Quantum Wires, Supper Lattices Band and Band Offsets, Quantum Dot Lasers.

UNIT – III SYNTHESIS OF NANOMATERIALS **12 Hour**

Wet Chemical Synthesis for Nanomaterials: Chemical and co-Precipitation, Sol Fundamentals-Sol-Gel Synthesis of Metal Oxides, Micro Emulsions or Reverse Micelles, Solvothermal, Microwave Heating Synthesis, Sonochemical Synthesis, Electrochemical Synthesis, Photochemical Synthesis, Langmuir Blodgett (LB) Technique.

UNIT - IV CHARACTERIZATION TECHNIQUES **13 Hour**

Powder X-Ray Diffraction, Energy Dispersive X-Ray (EDX), X-Ray Photoelectron Spectroscopy (XPS), Scanning Electron Microscope (SEM), Transmission Electron Microscope (TEM), Scanning Tunneling Microscope (STM), Atomic Force Microscope (AFM), UV-Visible Absorption.

UNIT – V APPLICATIONS OF NANOMATERIALS AND NANOCOMPOSITES **13 Hour**

Nanosensors Based on Optical Properties and Quantum Size Effects: Sensors Based on Physical Properties-Electrochemical Sensors, Sensors for Aerospace, Defense and Biosensors. Energy: Solar Cells, LEDs and Photovoltaic Device Applications.

Text Books

- Viswanathan, B. (2006). *Structure and Properties of Solid State Materials.* Oxford: Alpha Science International (2nd Ed.).
- Pradeep, T. (2007). *Nano the Essentials*. Tata McGraw-Hill Publishing Company Ltd.

Reference Books

- Schmidt, G. (2004). *Nanoparticles: from Theory to Application.* Wiley Weinheim.
- Sulabha, K. Kulkarni. (2007). *Nanotechnology Principle and Practices*. Capital Publishing Company. India.

III & IV EVALUATION COMPONENTS OF CIA

Semester	Category	Course Code	Course Title	Component-III	Component-IV
I	Core I	PPHM101	Mathematical Physics- I	Seminar - Power Point Presentation	Problem solving
	Core II	PPHM107	Classical Mechanics	Assignment	Assignment
	Core III	PPHM105	Electronics	Poster Presentation	Simple experiments (Model display)
	Core IV	PPHM106	Molecular Spectroscopy	Poster Presentation	Model display
II	Core VI	PPHM205	Mathematical Physics II	Problem solving	Assignment
	Core VII	PPHM201	Quantum Mechanics I	Assignment	PPT
	Core VIII	PPHM208	Electromagnetic Theory	Assignment	Poster presentation
	Core IX	PPHM207	Solid State Physics I	Assignment	Seminar

NON-MAJOR ELECTIVE

Semester	Category	Course Code	Course Title	Component-III	Component-IV
II	NME	PPHE201	Nanoscience	Seminar	Poster Presentation

DEPARTMENT OF COMPUTER SCIENCE

PREAMBLE

UG : Programme Profile- List of Courses offered to other Departments and Syllabi of Courses in the I and II Semesters along with Evaluation Components III and IV (with Effect from 2021-2024 Batch onwards) and

PG : Programme Profile- List of Courses offered and Syllabi of Courses in the I and II Semesters along with Evaluation Components III and IV (with Effect from 2021-2023 Batch onwards).

PROGRAMME PROFILE B.Sc. (Computer Science)

(LEARNING OUTCOMES-BASED CURRICULUM FRAMEWORK)

PSO:1 Ability to Understand, Analyze, Design, Develop and Optimize Solutions related to Computer Programming Languages.

PSO:2 Application of concepts in Core Areas related to Computer Programming for Efficient Design of Computer-Based Systems of Varying Complexity.

PSO:3 Ability to test the Technical issues in Software Engineering and Deliver a Quality Product for Business Success.

PSO:4 Ability to Innovate and Develop New Technologies.

Semester	Part	Category	Course Code	Course Title	Previous Course Code	Contact Hrs/ Week	Credit Min/Max
I	I	Language	UTAL107/ UTAL108	Languages/ AECC-II Tamil-I/ Hindi-I/ French-I (2 Levels)	UTAL105/ UTAL106/ UHIL101/ UFRL101	5	3/4
	II	English	UENL109/ UENL110	English for Communication (Stream-I)/ English for Communication (Stream-II)	UENL107/ UENL108	5	3/4
	III	Major Core (DSC) - I	UCSM110/ UCAM110	Principles of Information Technology	UCSM108	5	4
	III	Major Core (DSC) - II	UCSM109/ UCAM111	Programming Methodology	-	4	4
	III	Major Core (DSC) - III	UCSR110/ UCAR106	Programming Methodology - Practical	-	3	2
	III	Allied (GE) - I	UMAA114	Mathematics for Computer Science	-	6	4
	III	Professional English	UPEM101	Professional English I	-	6	4
	IV	Value Education (SEC)				2	1
					Total	**36**	**25/27**

Semester	Part	Category	Course Code	Course Title	Previous Course Code	Contact Hrs/ Week	Credit Min/Max
II	I	Language	UTAL207/ UTAL208	Languages/ AECC-II Tamil-II/ Hindi-II/ French-II (2 Levels)	UTAL205/ UTAL206/ UHIL201/ UFRL201	5	3 /4
	II	English	UENL209/ UENL210	English for Communication (Stream-I)/ English for Communication (Stream-II)/	UENL207/ UENL208	5	3/4
	III	Major Core (DSC) - IV	UCSM207/ UCAM206	Data Structures	UCSM206	4	4
	III	Major Core (DSC) - V	UCSM208/ UCAM207	Python Programming	-	4	4
		Major Core (DSC) - VI	UCSR207/ UCAR205	Data Structures using Python - Practical	UCSR206	3	2
	III	Allied (GE) - II	UMAA218	Mathematics for Computer Science	-	6	4
	III	Professional English	UPEM201	Professional English II	-	6	4
	IV	NME (Skill Enhancement Course)					
	V	Extension Programme / Physical Education/ NCC				-	1/2
					Total	**36**	**27/30**
III	I	Language	UTAL307/ UTAL308	Languages/ AECC-II Tamil-III/ Hindi-III/ French-III(2 Levels)	UTAL305/ UTAL306 UHIL301/ UFRL301	5	3 /4
	II	English	UENL309/ UENL310	English for Communication (Stream-I)/ English for Communication (Stream-II)	UENL307/ UENL308	5	3 /4
	III	Major Core (DSC) - VII	UCSM305	Java Programming	UCSM304	5	5
	III	Major Core (DSC) - VIII	UCSM307	Software Engineering	UCSM511	4	4
	III	Major Core (DSC) - IX	UCSR308	Java Programming – Practical	UCSR305	3	2
	III	Allied (GE) - III	UPHA304	Digital Electronics for Computer Science	UPHA303	3	2
	III	Allied (GE) -IV	UPHR304	Digital Electronics for Computer Science – Practical	-	3	2
	IV	Value Education (SEC)			-	2	1
					Total	**30**	**22/24**

Semester	Part	Category	Course Code	Course Title	Previous Course Code	Contact Hrs/ Week	Credit Min/Max
IV	I	Language	UTAL407/ UTAL408	Languages/ AECC-II Tamil-IV/ Hindi-IV/ French-IV(2 Levels)	UTAL405/ UTAL406/ UHIL401/ UFRL401	5	3 /4
	II	English	UENL409/ UENL410	English for Communication (Stream-I)/ English for Communication (Stream-II)	UENL407/ UENL408	5	3/ 4
	III	Major Core (DSC) - X	UCSM409	Operating Systems		5	5
	III	Major Core (DSC) - XI	UCSR412	Operating System Practical	UCSR411	4	3
	III	Allied (GE) - V	UPHA403	Electronics for Computer Science		3	2
	III	Allied (GE) - VI	UPHR403	Electronics for Computer Science– Practical		3	2
	IV	NME (Skill Enhancement Course)				3	2
	IV	Online Courses		NPTEL/SPOKEN TUTORIAL/SWAYAM		3	1/2
	IV	Soft Skill (SEC)				2	1
	V	Extension Programme / Physical Education				-	0/2
					Total	**30**	**22/26**
V	III	Major Core (DSC) - XII	UCSM506	Middleware Technologies	-	5	5
	III	Major Core (DSC) - XIII	UCSM510	Computer Networks		**5**	**4**
	III	Major Core (DSC) - XIV	UCSM512	Database Management System	UCSM509	4	4
	III	Major Core (DSC) - XV	UCSR512	Middleware Technologies - Practical	UCSR509	4	3
	III	MAJOR ELECTIVE (Discipline Specific Elective)– XVI	UCSO501/ UCSO502/ UCSO503	Computer Ethics/ Computer Graphics/ Data Mining	-	5	4
	III	Major Core (DSC) - XVII	UCSP501	Project	UCSP601	5	5
	IV	Value Education				2	1
					Total	**30**	**26**

Semester	Part	Category	Course Code	Course Title	Previous Course Code	Contact Hrs/ Week	Credit Min/Max
VI	III	Major Core (DSC) - Core XVIII	UCSM612	Cloud Computing	-	**5**	**5**
	III	Major Core (DSC) - XIX	UCSM614	Bigdata Tools	UCSM610	5	4
	III	Major Core (DSC) - XX	UCSM615	Internet of Things	UCSO608	5	4
	III	Major Core (DSC) - XXI	UCSR608	Bigdata Tools Practical	-	4	4
	III	Major Core (DSC) - XXII	UCSR609	Cloud Computing-Practical	UCSR508	4	3
	III	MAJOR ELECTIVE (Discipline Specific Elective)– XXIII	UCSO609/ (UCSO610/ UCSM613)/ UCSO606	Artificial Intelligence/ Open Source Technology/ Network Security	-	5	4
	III	Viva – Voce	UCSM611	Comprehensive Viva Voce	-	-	1
	IV	Soft Skill (SEC)				2	1
	V	Extension Programme / Physical Education/NCC				-	0/2
					Total	**30**	**26/28**
					Grand Total	**192**	**148/161**

ALLIED COURSES OFFERED TO OTHER DEPARTMENTS

Class & Major	Semester	Category	Course Code	New Course Title	Previous Course Code	Contact Hrs/ Week	Credit Min/Max
B.Com with Computer Applications	I	Allied	UCSA105	Multimedia	UCSA303	3	2
	I	Allied Practical	UCSR111	Multimedia Lab	UCSR306	3	2
	II	Allied	UCSA205	C Programming	UCSA104	3	2
	II	Allied Practical	UCSR208	C Programming Lab	UCSR110	3	2
	III	Allied	UCSA306	Object Oriented Programming	UCSA204	3	3
	III	Allied Practical	UCSR310	Object Oriented Programming – Lab	UCSR207	3	2
	IV	Allied	UCSA408	Fundamentals of Blockchain Technology	UCSA305	3	3
	IV	Allied Practical	UCSR414	Blockchain Technology Using Solidity – Lab	UCSR309	3	2
	V	Allied	UCSA510	Digital Marketing Analytics	UCSA406	3	3
	V	Allied Practical	UCSR513	Web Design using Microsoft Expression Web4 - Lab	UCSR412	3	2
Class &	**Semes**	**Category**	**Course Code**	**New Course Title**	**Previous**	**Contact**	**Credit**

Major	ter				Course Code	Hrs/ Week	Min/Max
BBA, B.Com and B.COM(IAT)	IV	Allied	UCSA409	Business Analytics and Intelligence.	UCSA509	3	3
	IV	Allied Practical	UCSR415	Business Analytics and Intelligence - Lab	UCSR512	3	2
Tamil	V	Allied	UCSA505	Tamil Kanini	-	3T + 2P	5
Maths	III	Allied	UCSA304	Mathematical Programming using C	-	3	3
	III	Allied Practical	UCSR307	Mathematical Programming using C – Lab	-	3	2
	V	Allied	UCSA507	Object Oriented Programming using Java	-	3	3
	V	Allied Practical	UCSR508	Object Oriented Programming using Java - Lab	-	3	2
Physics	III	Allied	UCSA306	Computational Physics with Python	-	3	3
	III	Allied Practical	UCSR310	Computational Physics with Python – Lab	-	3	3

NON-MAJOR ELECTIVE

Semester	Part	Category	Course Code	Course Title	Previous Course Code	Contact Hrs/week	Credit Min/Max
II	IV	Non Major Elective	UCSE206	Tableau Programming	UCSE202	1T+2P	2
			UCSE207	Python Programming	UCSE203	3P	2
			UCSE208	R Programming	UCSE204	3P	2
			UCSE209	Arduino Programming	UCSE205	3P	2
			UCSE210	Go Programming	-	3P	2
IV	IV	Non Major Elective	UCSE406	IOT Projects	-	3P	2
			UCSE407	Mobile Application Development	-	3P	2

EXTRA CREDIT EARNING PROVISION

Semester	Part	Category	Course Code	Course Title	Contact Hrs/week	Credit	
						Min	Max
II	III	Core	UCSI201	Summer Internship / Working Model	-	-	1
IV	III	Core	UCSI401	Summer Internship	-	-	1
V	III	Self Study Paper	UCSS501	Python Programming	2	1	1
V	III	Self Study Paper	UCSS502/ UCAS502	Android Applications	2	1	1
VI	III	Self Study Paper	UCSS601/ UCAS601	Angular JS	2	1	1
VI	III	Self Study Paper	UCSS602/ UCAS602	Green Computing	2	1	1

A. Experiential Learning (Mandatory)

Course Mapping				Collaborating Agency - MSME		
Sem	**Course Code**	**Course Title**	**Assessment**	**Course Title**	**Hour/Days/ Month**	**Mode of Evaluation**
VI	UCSM614	Big Data Tools	Component IV	Data Analytics certification	4 Days	Reflection

B. Skill Orientation Programme (Only for Interested students) – Extra Credit Earning Provision

Sem	Category	Course Code	Course Title	Collaborating Agency	Hour/ Days/Month	Mode of Evaluation	Credits (Min/Max)
V	Core	UCST501	Robotics Process Automation	MSME	4 Days	Reflection	1

***MSME Courses will be select at that time of availability.**

PRINCIPLES OF INFORMATION TECHNOLOGY

UCSM110/UCAM110

Semester : I **Credit : 4**
Category : Major Core (DSC) - I **Hour/Week: 5**
Class & Major: I B.Sc Computer Science **Total Hour: 65**

Objectives:

To enable the Students

- Obtain Knowledge on Object Oriented Programming Concepts.
- Understand the Basics of Microprocessor and Compiler.
- Acquire Knowledge on Information Security and Open Source Software.

Learning Outcomes:

On Completion of the course, the students will be able to

- Develop Logic for Assembly Language Programming.
- Analyze the Performance of Commercially available Computers.
- Examine the Construction of CPU, know Registers and Bus Systems.

UNIT - I PROGRAMMING LANGUAGES **13 Hour**

Introduction - Evolution of Programming Languages- Classification of Programming Languages - Generations of Programming Languages - Features of a Good Programming Language- Selection of a Programming Language

UNIT - II FUNDAMENTALS OF COMPUTER ARCHITECTURE **13 Hour**

Introduction- Central Processing Unit (CPU) Memory- Communication between Various Units of a Computer System- The Instruction Format- Instruction Set- Processor Speed- Multiprocessor Systems. Primary Memory Introduction- Memory Hierarchy- Random Access Memory (RAM)- Types of RAM- Read Only Memory (ROM)- Types of ROM. Secondary Storage Introduction- Classification of Secondary Storage Devices- Magnetic Tape- Magnetic Disk- Optical Disk- Magneto Optical disk. Input Devices - Output Devices.

UNIT - III MICROPROCESSOR **13 Hour**

Introduction to Microprocessor – Microcontroller - 8085 Microprocessor and Architecture - Opcode fetch - Machine cycle - Memory Read Machine Cycle - Memory Write Machine Cycle - IO Read Machine Cycle - IO Write Machine Cycle - Execution time of the Instruction Cycle.

UNIT - IV INFORMATION SECURITY **13 Hour**

Introduction to Information Security - Components of Information System - Balancing Information Security and Access - The Systems Development Life Cycle - The Security Systems Development Life Cycle - Security Professionals and Organization.

UNIT - V OPEN SOURCE SOFTWARES **13 Hour**

Introduction to Open sources – Need of Open Sources – Advantages of Open Sources – Application of Open Sources. Open Source Operating Systems: LINUX. Introduction: MySQL - PHP – Python.

Text Books

- Arvind Kumar Bansal. (2014). *Introduction to Programming Languages*. CRC PRESS. Taylor and Francis Group.
- Michael, E. Whitman. Herbert, J. Mattord. (2012). *Principles of Information Security.* Course Technology. *(*4th Ed.). Cengage Learning.
- Alexis Leon. Mathews Leon. (2009). *Fundamentals of Information Technology.* Vikas Publishing House Pvt. Ltd.
- Rasmus Lerdorf. Levin Tatroe. (2012). *Programming in PHP.* Reilly.
- Ramesh, S. Goankar. (2011). *Microprocessor Architecture Programming and Applications with 8085.* Penram International. (5th Ed.).

Reference Books

- Dennis, P. Curtin. Kim Foley. Kunal Sen and Cathleen Morin. (2005). *Information Technology - the Breaking Wave.* Tata-McGraw Hill Publications. (7th Reprint).
- Alexis Leon. Mathews Leon. (2004). *Fundamentals of Information System.* Co-Published by Vijay Nicole Imprints Pvt Ltd.

e-Resource

- http://indexof.es/Computer/Fundamentals%20of%20Computer%20Organization%20and%20Architecture.pdf

PROGRAMMING METHODOLOGY

UCSM109/UCAM111

Semester : I **Credit: 4**
Category : Major Core (DSC) - II **Hour/Week: 4**
Class &Major: I B.Sc Computer Science **Total Hour: 52**

Objectives:

To enable the Students

- Develop Simple Algorithms and Flow Charts to Solve a Problem.
- Acquire Knowledge on Functions, Arrays and Structures.
- Understand the concepts of File Management.

Learning Outcomes:

On Completion of the course, the students will be able to

- Be familiar with Good Programming Practice, and apply it in various programs.
- Know about Insecure Functions to be avoided.
- Understand the Compilation Process in File concepts.

UNIT – I INTRODUCTION TO PROGRAMMING **10 Hour**

Introduction to Programming, Program Concept, Characteristics of Programming, Stages in Program Development, Algorithms, Notations, Design, Flowcharts, Types of Programming Methodologies, Introduction to C++ Programming - Basic Program Structure In C++, Variables and Assignments, Input and Output, Selection and Repetition Statements.

UNIT – II FUNCTIONS **10 Hour**

Top-Down Design, Predefined Functions, Programmer -defined Function, Local Variable, Function Overloading, Functions with Default Arguments, Call -By-Value and Call-By-Reference Parameters, Recursion.

UNIT – III ARRAYS, STRUCTURES & UNION **12 Hour**

Introduction to Arrays, Declaration and Referring Arrays, Arrays in Memory, Initializing Arrays. Arrays in Functions, Multi-Dimensional Arrays. Structures - Member Accessing, Pointers to Structures, Structures and Functions, Arrays of Structures, Unions.

UNIT – IV STRINGS **10 Hour**

Declaration and Initialization, Reading and Writing Strings, Arrays of Strings, String and Function, Strings and Structure, Standard String Library Functions.

UNIT – V FILES **10 Hour**

Files- File Streams - Creating File Streams - Open Modes - Closing Files - Reading and Writing Blocks.

Text Books

- Dale, N. and Weems, C. (2010). *Programming and Problem Solving with C++: Brief Edition.* Jones & Bartlett Learning.
- Kenrick Mock (2015). *Problem solving with C++ / Walter Savitch; Contributor.* (9th Ed.). ISBN-13: 978-0-13-359174-3

Reference Book

- Hanly, J.R. Koffman, E.B. (2015). *Problem Solving and Program Design*. Pearson.

E-Resource

- http://www.lmpt.univ-tours.fr/~volkov/C++.pdf

PROGRAMMING METHODOLOGY- PRACTICAL

UCSR110/UCAR106

Semester : I **Credit: 2**
Category :Major Core (DSC) - III **Hour/Week : 3**
Class &Major : I B.Sc Computer Science **Total Hour: 39**

Objectives:

To enable the students

- Acquire Knowledge on Basic Skills Coupled with Top Down Design Principles.
- Develop the Skills for Formulating Iterative Solutions to a Problem.
- Understand the Concepts of File Management.

Learning Outcomes

On Completion of the course, the students will be able to

- Apply Problem-Solving Knowledge and Skills to Write Effective C++ Programs.
- Appreciate the use of Simple Data Structure such as Array, Structures and Unions.
- Identify Opportunities to Write Modularized Code.

LIST OF PROGRAMS

1. Arithmetic Operators and Mathematical Expressions
2. Conditional Operators
3. Control Structures – Decision Making
4. Control Structures – Looping
5. Functions and Parameter passing in functions, writing Recursive Programs.
6. Arrays
7. Structures
8. Union.
9. Strings and string handling operations.
10. Files for data input and output.

DATA STRUCTURES

UCSM207/UCAM206

Semester : II **Credit : 4**
Category : Major Core (DSC) - IV **Hour/Week : 4**
Class &Major :I B.Sc Computer Science **Total Hour : 52**

Objectives:

To enable the Students

- Acquire Knowledge on Basic Operations like Insert, Delete, Search etc.,
- Design Programs using various Data Structures including Hash Tables, Binary and General Search Trees, Heaps, Graphs etc.
- Know and Implement the Applications of Algorithms for Sorting, Pattern Matching etc.

Learning Outcomes

On Completion of the course, the students will be able to

- Understand and Restate the Fundamentals of Basic Data Structures.
- Implement Basic Data Structures such as Stacks, Queues and Trees.
- Implement the Algorithms for Sorting and Searching.

UNIT – I INTRODUCTION TO ALGORITHM **11 Hour**

Basic Concepts- Algorithm Specification-Introduction, Recursive Algorithms, Data Abstraction Performance analysis, Linear and Non-Linear Data Structures, Singly Linked Lists-

Operations, Circularly linked Lists-Operations, Doubly Linked Lists- Operations. Representation of Single, Two Dimensional Arrays, Sparse Matrices-Array and Linked Representations.

UNIT - II STACK & QUEUE OPERATIONS **10 Hour**

Stack- Operations, Array and Linked Implementations, Applications- Infix to Postfix Conversion, Postfix Expression Evaluation, Recursion Implementation. Queue- Definition and Operations, Array and Linked Implementations, Circular Queues - Insertion and Deletion Operations.

UNIT - III TREES **10 Hour**

Trees, Representation of Trees, Binary tree, Properties of Binary Trees, Binary Tree Representations- Array and Linked Representations, Binary Tree Traversals, Threaded Binary Trees, Priority Queue- Implementation, Heap- Definition, Insertion, Deletion.

UNIT - IV GRAPHS **10 Hour**

Graphs, Graph ADT, Graph Representations, Graph Traversals, Searching, Static Hashing- Introduction, Hash tables, Hash functions, Overflow Handling.

UNIT – V SORTING & SEARCHING ALGORITHMS **11 Hour**

Sorting Methods: Bubble Sort – Insertion Sort – Quick Sort – Heap Sort. Searching Trees: Binary Search Trees, AVL Trees- Definition and Examples- Pattern Matching Algorithm.

Text Books

- Michael, T. Goodrich. Roberto Tamassia. Michael, H. Goldwasser. (2013). *Data Structures and Algorithms in Python.* Wiley.
- Dr. Kent, D. Lee, Dr. Steve Hubbard. (2015). *Data Structures and Algorithms with Python.* Springer Nature.
- Rance, D. Necaise. (2016). *Data Structures and Algorithms Using Python.*

Reference Books

- Benjamin Baka. Dr BasantAgarwal.(2018). *Hands-On Data Structures and Algorithms with Python.* (2nd Ed.).
- Horowitz, E,Sahni, S. and Susan Anderson-Freed. *Fundamentals of Data Structure*. Universities Press. (2ndEd.).

E-Resource

- file:///C:/Users/admins/AppData/Local/Temp/Data%20Structures%20and%20Algorithms%20in%20Python%20[Goodrich,%20Tamassia%20Goldwasser%202013-03-18]-1.pdf

PYTHON PROGRAMMING

UCSM208/UCAM207

Semester : II **Credit : 4**
Category : Major Core (DSC) - V **Hour/Week : 4**
Class &Major : I B.Sc Computer Science **Total Hour : 52**

Objectives:

To enable the Students

- Acquire Knowledge on Concepts of Functions & Illustrative Programs.
- Understand Python Lists, Tuples to Represent Compound Data.
- Develop and Execute Simple Python Programs.

Learning Outcomes:

On Completion of the course, the students will be able to

- Define and Demonstrate the Use of Built-in Data Structures "Lists" and "Dictionary".
- Design and Implement GUI Application and How to Handle Exceptions and Files
- Implement a Program to solve a Real World Problem.

UNIT - I INTRODUCTION TO PYTHON **11 Hour**

Introduction to Python: Python, Features of Python, Execution of a Python, Program, Writing Our First Python Program, Data types in Python. Python Interpreter and Interactive Mode; **Values and Types**: int, float, Boolean, String, and List; Variables, Expressions, Statements, Tuple Assignment, Precedence of Operators, Comments; **Modules and Functions**: Function Definition and Use, Flow of Execution, Parameters and Arguments.

UNIT – II CONTROL STATEMENTS & FUNCTIONS **10 Hour**

Control Statements: Boolean Values and operators - Conditional (if), Alternative (if-else), Chained Conditional (if-elif-else); **Iteration**: State, While, for, Break, Continue, Pass; **Fruitful Functions**: Return Values – Parameters - Local and Global Scope -Function Composition -Recursion.

UNIT - III ARRAYS, STRINGS &ILLUSTRATIVE PROGRAMS **11 Hour**

Arrays: Lists as Arrays. **Strings:** String Slices – Immutability - String Functions and Methods - String Module; **Illustrative Programs:** Square Root –GCD – Exponentiation - Sum an Array of Numbers - Linear Search - Binary Search.

UNIT- IV LISTS & TUPLES **10 Hour**

Lists: List Operations - List Slices - List Methods - List Loop – Mutability – Aliasing - Cloning Lists - List Parameters; **Tuples:** Tuple Assignment - Tuple as Return Value; **Dictionaries:** Operations and Methods; Advanced List Processing - List Comprehension; **Illustrative Programs:** Selection Sort - Insertion Sort - Merge Sort - Histogram.

UNIT- V FILES &EXCEPTION HANDLING **10 Hour**

Files and Exception: Text Files, Reading and Writing Files, Format Operator; Command Line Arguments, Errors and Exceptions, Handling Exceptions, Modules, Packages; **Illustrative Programs:** Word Count, Copy File.

Text Books

- Mark Lutz. (2013). *Learning Python.* O'Reilly. (5th Ed.)
- Tony Gaddis. (2018). *Starting Out With Python.* Pearson. (4th Ed.)

Reference Books

- Kenneth A. Lambert. (2011). *Fundamentals of Python*.
- James Payne. (2010). *Beginning Python using Python.2.6 and Python 3.1*. wiley.

E-Resource

- http://www.sfu.ca/~eep2/Technology/Learning%20Python%205th%20Ed%202013.pdf

DATA STRUCTURES USING PYTHON PRACTICAL

UCSR207/UCAR205

Semester : II **Credit : 2**
Category : Major Core (DSC) - VI **Hour/Week : 3**
Class & Major : I B.Sc Computer Science **Total Hour :39**

Objectives:

To enable the Students

- Understand various Data Representation Techniques in the Real World.
- Implement Basic Concepts of Linear and Non-Linear Data Structures.
- Solve the Sorting and Searching Algorithms.

Learning Outcomes:

On Completion of the course, the students will be able to

- Understanding the writing Algorithms in solving Problems with the help of Fundamental Data Structures.
- Analyze the basic Concepts of Lists, Tuples, Trees and Graphs.
- Implement the Concepts of Searching and Sorting Techniques.

LIST OF PROGRAMS

1. Create a list of Elements where the Size of the List, Elements to be Inserted and Deleted are Dynamically given as Input.
2. Implement the Operations, Insertion, Deletion at a given Position in the List and Search for an Element in the list
3. Implement PUSH, POP Operations of Stack Operations.
4. Implement Add, Delete Operations of Queue.
5. Evaluate the Infix and Postfix Expression using Stack Operations
6. Implement the Graph Traversal Algorithms:
    a. Depth First Search.
    b. Breadth First Search
7. Binary Tree Traversal Using Linked List (In-order, Pre-order, Post-order).
8. Sorting Methods
    a. Bubble Sort
    b. Insertion Sort
    c. QuickSort
9. Searching Methods
    a. Linear Search
    b. Binary Search
    c. Fibonacci Search
10. Create a Binary Search Tree and Count the Number of Nodes in the Binary Search Tree.

ALLIED COURSES OFFERED TO OTHER DEPARTMENTS MULTIMEDIA

UCSA105

Semester : I **Credit :** 2
Category : Allied (GE-I) **Hour/Week: 3**
Class & Major: I B.Com (CA) **Total Hour :39**

Objectives:

To enable the students

- Understand the Concepts in Multimedia
- Apply Multimedia Concepts in Photoshop and Flash
- Develop Multimedia Applications with their Creative ideas.

Learning Outcomes:

On Completion of the course, the students will be able to

- Define Multimedia and Process.
- Understand Multimedia Components using various Tools and Techniques.
- Utilize the Different types of Media Format and their Properties.

UNIT - I INTRODUCTION **7 Hour**

Definition - Classification - Multimedia Application - Multimedia Hardware - Multimedia Software - CDROM - DVD.

UNIT - II MULTIMEDIA AUDIO **8 Hour**

Digital medium - Sound cards - Recording - Editing - MIDI fundamentals - Working with MIDI.

UNIT - III MULTIMEDIA TEXTAND GRAPHICS **8 Hour**

Text in Multimedia - Multimedia Graphics**:** Coloring - Digital Imaging Fundamentals - Development and Editing.

UNIT - IV MULTIMEDIA ANIMATION AND VIDEO **8 Hour**

Computer Animation Fundamentals - Animation s/w Tools and Techniques. Multimedia Video: How Video Works – Video Shooting – Video Capture Process.

UNIT - V MULTIMEDIA- PROJECT **8 Hour**

Stages of Project - Design Concept - Authoring - Planning and Costing – Multimedia Team.

Text Books

- Gokul, S. (2008).*Multimedia Magic.* BPS Publication. (2nd Ed.). New Delhi.
- Tay Vaughan. (2010). *Multimedia: Making it Work.* Tata McGraw Hill. (9th Ed.). New Delhi.

Reference Books

- Ben Willmore. Dan Ablan. (2009). *Adobe Photoshop CS4 Studio Techniques*. Peachpit Publishers. (2nd Reprint). New Delhi.
- Nick Vandome. (2011). *Photoshop Elements 9*.jumpstart. McGraw Hill Ed. New Delhi.

e-Resources

- http://books.rediff.com/book/multimedia-magic/9788183330695
- https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&uact=8&ved=0ahUKEwifpaWT74

MULTIMEDIA – LAB

UCSR111

Semester : I **Credit : 2**
Category : Allied (GE-II) **Hour/Week : 3**
Class &Major: I B.Com (CA) **Total Hour:39**

Objectives:

To enable the students

- Understand the Basic Concepts in Multimedia.
- Design Multimedia Projects in Photoshop and Flash.
- Develop Multimedia in Real Time Applications.

Learning Outcomes:

On Completion of the course, the students will be able to

- Use Basic Selection Tools and Edge Refinement to Isolate and Edit parts of an Image.
- Demonstrate Progress in Basic Drawing and Animation skills.
- Use Preset Brushes and Custom Brushes to Colorize Images, Enhance Images, and Build illustrations.

LIST OF PROGRAMS

1. Photo Effects: Image, Changing Cloth Texture and Pattern, Changing Background.
2. Create a Brick Wall Texture using Photoshop.
3. Photo Retouching: Color Correction, Blending Image.
4. Smooth Skin Effect.
5. Adding Blur Effect to Background.
6. Create Digital Banner using Text.
7. Bouncing a Ball in Flash.
8. Create Torn Paper Edge Effect.
9. Create a Masking Effect in Flash.
10. Create a Banner using Flash.

C PROGRAMMING

UCSA205

Semester : II **Credit :** 2
Category : Allied **Hour/Week: 3**
Class &Major : I B.Com CA **Total Hour :39**

Objectives:

To enable the students

- Understand the Basic Computer Knowledge
- Implement basic Concepts of the C Programming Language.
- Design, Build, Execute and Debug C Applications.

Learning Outcomes:

On Completion of the course, the students will be able to

- Understanding a Functional Hierarchical Code Organization.
- Ability to Define and Manage Data Structures Based on Problem Subject Domain.
- Ability to Work with Arrays of Complex Objects.

UNIT- I COMPUTER BASICS **8 Hour**

Introduction – Evolution, Generation & Classification of Computers – Computer system – Application of Computers. Input Devices, Output Devices, Storage Devices. **Information – Technology:** IT- Role of IT – IT and Internet – Careers in IT Industry. **Internet Tools**: Web

Browser – Browsing Internet – Email – Search Engines – Instant Messaging. E-Commerce – Electronic Data Interchange (EDI) – Mobile Communication – Bluetooth – Global Positioning System.

UNIT- II OVERVIEW OF C **8 Hour**

Importance of C - C Program Structure - Sample C Program. Constants - Variables and Data Types - Character Set - C Tokens - Keywords and Identifiers - Declaration of Variables - Assigning Values to Variables - Operators – Expression - Arithmetic - Relational - Logical - Assignment - Increment - Decrement –Conditional - bitwise and Special Operators - Arithmetic Expressions - Operator Precedence - Type Conversions.

UNIT- III DECISION MAKING AND BRANCHING **7 Hour**

Decision making with If - Simple IF - IF ELSE - Nested IF ELSE - ELSE IF Ladder – Switch - GOTO Statement. **Looping:** While - Do-While – For - Jumps in Loops.

UNIT- IV ARRAYS, STRINGS AND USERDEFINED FUNCTIONS **8 Hour**

Declaration and Accessing of One &Two-dimensional Arrays - Initializing Two-Dimensional Arrays - Multidimensional Arrays.Declaring and Initializing String Variables – Reading Strings from Terminal – Writing Strings to Screen – Putting Strings Together – Comparison of Two Strings – String Handling Functions. User defined Functions -Recursion.

UNIT- VSTRUCTURES, UNIONS AND POINTERS **8 Hour**

Defining - Giving Values to Members - Initialization and Comparison of Structure Variables - Arrays of Structure - Structures and Functions – Unions – Pointers.

Text Book

- Bala Gurusamy, E. (2012). *Programming in ANSI C.* Tata McGraw-Hill. (6th Ed.). New Delhi.

Reference Books

- Ashok N. Kamthane. (2006).*Programming in ANSI C and Turbo C.* Pearson Education. (3rd Ed). New Delhi.
- Yashavant Kanetkar, Y. (2010). *Let us C*.BPB Publication. (10th Ed.). New Delhi.

e-Resources

- http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-087-practical programming-in-c-january-iap-2010/lecture-notes/
- http://freevideolectures.com/Course/2519/C-Programming-and-Data-Structures/2
- http://www.powershow.com/view/d7c5Y2Y2N/OBJECT_ORIENTED_PROGRAMMIN G_powerpoint_ppt_presentation

C PROGRAMMING – LAB

UCSR208

Semester : II **Credit : 2**
Category : Allied **Hour/Week : 3**
Class &Major : I B.Com CA **Total Hour :39**

Objectives:

To enable the students

- Implement Basic Concepts of the C Programming Language.
- Develop Programs by using Control Structure, Arrays, Functions, Pointers and Files.
- Design, Build, Execute and Debug C Programs.

Learning Outcomes:

On Completion of the course, the students will be able to

- Recollect various Programming Constructs and to Develop C Programs.
- Understand the Fundamentals of C Programming.
- Choose the Right Data Representation Formats Based on the Requirements of the Problem.

LIST OF PROGRAMS

1. Write a C Program on Operators.
2. Write a C Program on Decision Making.
3. Write a C Program on Decision Looping.
4. Write a C Program on Arrays.
5. Write a C Program on Strings.
6. Write a C Program on Functions.
7. Write a C Program on Recursion.
8. Write a C Program on Structures.
9. Write a C Program on Union.
10. Write a C Program on Pointers.

NON-MAJOR ELECTIVES
TABLEAU PROGRAMMING

UCSE206

Semester : II **Credit : 2**
Category : NON MAJOR ELECTIVE **Hour/Week : 1T+ 2P**
Class &Major : I UG **Total Hour : 52**

Objectives:

To enable the students

- Learn Basic Concepts of Tableau Statistics and Tableau Interactive Dashboard.
- Acquire Knowledge in Master Tableau Reporting, Graphs, Maps, Table Calculation.
- Implementing the Concepts in Tableau.

Learning Outcomes:

On Completion of the course, the students will be able to

- Include Creating Advanced Visualizations, Formatting, Calculations, Tricks, and Tips to use Tableau.
- For Customer Analytic the Skills you will Gain as Predictive Analytics, Regression Analysis, Marketing Performer.

UNIT- I INTRODUCTION **5 Hour**

Introduction Tableau – Design Flow – File Types – Data Types - Connecting to Databases -Working with Data – Analyzing - Formatting.

UNIT- II CALCULATIONS **6 Hour**

Introduction to Calculations - Dashboard Development – Sharing - Data Calculations - Aggregate Calculations - User Calculations - Table Calculations - Logical Calculations -String Calculations - Number Calculations – LOD Expressions.

UNIT- III OPERATORS AND FUNCTIONS **5 Hour**

Type Conversion – Operators – Functions - Data Joining - Data Blending - Trendlines.

UNIT- IV SORTING AND FILTERING **5 Hour**

Add Worksheets – Paged Workbook – Sorting – Filtering Conditions - Filtering Measures - Grouping – Sets.

UNIT- V CHARTS **5 Hour**

Histograms - All Types of Charts - Tree Maps- Pareto Charts-Waterfall Charts-Bump Charts-Funnel Charts-Bollinger Bands.

LIST OF PROGRAMS

1. Data Visualization with Tableau - Tableau, Installation.
2. Basic Visualization Design - Exporting Data, Connecting Sheets, Loading into Tableau visualization Engine.
3. Visualizations Deep Dive - to Make Advance Charts and Graphs (Circle Plots, Side by Side Bars, Dual Charts, Area Charts, Tree Maps).
4. Data Organization - Calculated Metrics, Sorting, Filtering, Totals and Sub Totals, Various Aggregated Measures, Percentages.
5. Data Organization - Date and Time Functions, String Functions and logical Functions.
6. Playing with Time Dimension - Table Calculations, Moving Averages, Running Totals, Window Averages.
7. Incremental Loading and Blending - Custom SQL Queries, Creating Incremental Loads, Creating File Extractions.
8. Macros in Tableau – Parameters, Global Parameters.
9. Sharing Insights with Enterprise Dashboards - Creating Dashboards.

Text Book

- Joshua N. Milligan. (2015). *Learning Tableau.* Packt Publishing.

E-Resource

- https://www.tutorialspoint.com/tableau/

PYTHON PROGRAMMING

UCSE207

Semester : II **Credit: 2**
Category : NON MAJOR ELECTIVE **Hour/Week: 3**
Class &Major : I UG **Total Hour : 39**

Objectives:

To enable the students

- Implement Python Programs with Conditionals and Loops.
- Use Functions for Structuring Python Programs.
- Represent Compound data using Python Lists, Tuples, and Dictionaries.

Learning Outcomes:

On Completion of the course, the students will be able to

- Define and Demonstrate the use of Built-in Data Structures “Lists” and “Dictionary”.
- Design and Implement GUI Application and How to Handle Exceptions and Files.
- Implement a Program to Solve a Real World Problem.

LIST OF PROGRAMS:

1. Strings and Lists
    - To Calculate the Length of a String
    - To Get the Largest Number from a List
    - To Remove Duplicates from a List
2. Dictionary and Tuple
    - To Sort (Ascending and Descending) a Dictionary by Value
    - To Print a Dictionary Line by Line
    - To Create a Tuple with Different Data Types
3. Sets
    - To Create a Intersection, Union, and Difference of Sets
4. Array
    - To Append a New Item to the End of the Array.
    - To Remove the First Occurrence of a Specified Element from an Array
5. Conditional Statements
    - To Get the Fibonacci Series between 0 to 50.
    - To Accepts a String and Calculate the Number of Digits and Letters.
6. Functions
    - To Calculate the Factorial of a Number (a Non-negative Integer). The Function Accepts the Number as an Argument
    - To Reverse the Digits of an Integer
    - To Add Two Binary Numbers
7. Data structure
    - To Create an Enum Object and Display a Member Name and Value
    - To Compare Two Unordered lists (not sets).
    - To Push Three Items into the Heap and Print the Items from the Heap.
8. Searching and Sorting
    - Binary Search
    - Insertion Sort

R PROGRAMMING

UCSE208

Semester : II **Credit: 2**
Category : NON MAJOR ELECTIVE **Hour/Week: 3**
Class &Major : I UG **Total Hour : 39**

Objectives:

To enable the students

- Understand the Different Data Types in R.
- Use of Vectorized Calculations and Control Statements.
- Write User-Defined R Functions and Loop Constructs in R.

Learning Outcomes:

On Completion of the course, the students will be able to

- Understand the Basics in R Programming in terms of Constructs, Control Statements, String Functions.
- Understand the Use of R for Big Data Analytics.
- Learn to Apply R Programming for Text Processing.

LIST OF PROGRAMS

1. Write a Program on Vectors and Matrices.
2. Write a Program on Lists.
3. Write a Program on Factors.
4. Write a Program on Data Frame.
5. Write a Program on Array.
6. Write a Program on Time Series.
7. Write a Program on Storing data as Textual and Binary Format.
8. Write a Program on Reading And Writing Data in Files.
9. Write a Program on Functions.
10. Write a Program on Control Structures.
11. Write a Program on Debugging.
12. Write a Program on Simulations.

ARDUINO PROGRAMMING
UCSE209

Semester : II **Credit: 2**
Category : NON MAJOR ELECTIVE **Hour/Week: 3**
Class &Major : I UG **Total Hour :39**

Objectives:
To enable the students

- Understand the Basic of Arduino Programming.
- Develop a Basic Program in Arduino.
- Gain Knowledge in Arduino Software.

Learning Outcomes:
On Completion of the course, the students will be able to

- Provide Knowledge of Different Smart System Applications.
- Familiarize Students with Arduino as IDE, Programming Language & Platform.
- Provide Knowledge of Arduino Boards and Basic Components.

LIST OF PROGRAMS

1. Write a Program on Structure and Flow.
2. Write a Program on Variables.
3. Write a Program on Operators - Arithmetic Operators, Relational Operators, Logical Operators, Conditional Operator, and Increment Operator and Commenting.
4. Write a Program on Decision Statement - if Statement , if-else, and if-else-if.
5. Write a Program on Switch and Break.
6. Write a Program on Looping - For Loop and While Loop.
7. Write a Program on Functions – Calling Function and Returning a Value from a Function.
8. Write a Program on Arrays.
9. Write a Program on Strings.
10. Write a Program on Serial Input.

E-Resource

- https://startingelectronics.org/software/arduino/learn-to-program-course/

GO PROGRAMMING

UCSE210

Semester : II **Credit: 2**
Category : NME (SKILL ENHANCEMENT COURSE) **Hour/Week:3P**
Class & Major : I UG **Total Hour : 39**

Objectives:

To enable the students

- Learn Basics of Syntax of Go Programming.
- Understand Interfaces, Go Routines and Advanced concepts of Go.
- Implement a Good Distributed Application.

Learning Outcomes:

On Completion of the course, the students will be able to

- Understand and Use the Basic Programming Constructs of GO Language.
- Manipulate various GO Language Data types, such as Arrays, Strings, and Pointers.
- Write Faster and Modular Code, for Real-World.

LIST OF PROGRAMS

1. To Create an Operators using Go Programming.
2. To Create a Decision Making Statement using Go Programming.
3. To Create a Looping - For Loop and While Loop using Go Programming.
4. To Create a Functions using Go Programming.
5. To Create an Arrays and Strings using Go Programming.
6. To Create a Pointers using Go Programming.
7. To Create a Structures using Go Programming.
8. To Create a Slices & Ranges using Go Programming.
9. To Create a Interfaces using Go Programming.
10. To Create an Error Handling using Go Programming.

Text Book

- Alan, A. A. Donovan, Brian W. Kernighan. (2015). *The Go Programming Language.* Published in Paperback and Nov 20 in E-Book Addison-Wesley.

III AND IV EVALUATION COMPONENTS OF CIA

Semester	Part	Category	Course Code	Course Title	Component III	Component IV
I	III	Major Core (DSC) - I	UCSM110/ UCAM110	Principles of Information Technology	Assignment	Assignment
	III	Major Core (DSC) - II	UCSM109	Programming Methodology	Assignment	Problem Solving
	III	Major Core (DSC) - III	UCSR110	Programming Methodology - Practical	DPA	Viva-voce
II	III	Major Core (DSC) - IV	UCSM207	Data Structures	Assignment	Problem Solving
	III	Major Core (DSC) - V	UCSM208	Python Programming	Assignment	Problem Solving
	III	Major Core (DSC) - VI	UCSR207	Data Structures using Python - Practical	DPA	Viva-voce

ALLIED COURSES OFFERED TO OTHER DEPARTMENT

Semester	Part	Category	Course Code	Course Title	Component III	Component IV
I	III	Allied	UCSA105	Multimedia	Assignment	Poster Presentation
	III	Allied Practical	UCSR111	Multimedia Lab	DPA	Viva-voce
II	III	Allied	UCSA205	C Programming	Assignment	Problem Solving
	III	Allied Practical	UCSR208	C Programming Lab	DPA	Viva-voce

NON-MAJOR ELECTIVES

Semester	Part	Category	Course Code	Course Title	Component III	Component IV
II	IV	Non Major Elective	UCSE206	Tableau Programming	Assignment	Problem Solving
			UCSE207	Python Programming	DPA	Viva-voce
			UCSE208	R Programming	DPA	Viva-voce
			UCSE209	Arduino Programming	DPA	Viva-voce
			UCSE210	GO Programming	DPA	Viva-voce

PROGRAMME PROFILE M.Sc. (Computer Science)

PSO1: Demonstration of the Knowledge of Advanced Programming Skills and Distributed Environmental Need for Sustainable Development.

PSO2: Ability to Design and Develop Hardware and Software in Emerging Technology Environments.

PSO3: Ability to Solve Problems using the Techniques of Data Analytics like Pattern Recognition and Knowledge Discovery.

PSO4: Ability to Work out Effective and Efficient Real Time Solutions using Acquired Knowledge in Various Domains.

Semester	Category	Course Code	Course Title	Previous Course Code	Contact Hrs/ Week	Credit Min/Max
I	Core I	PCSM113	Principles of Concurrent Programming	-	5	4
	Core II	PCSM116	Digital Image Processing	PCSM404	4	4
	Core III	PCSM117	TCP / IP Networks	PCSM213	5	4
	Core IV	PCSM118	Compiler Design	-	4	4
	Core V	PCSM119	Mobile Computing	-	4	4
	Core VI	PCSR107	Digital Image Processing – Practical	-	4	3
	Core VII	PCSR108	TCP/IP Networks – Practical	-	3	2
	Extra Credit		Online Course (NPTEL/SWAYAM)	-	-	-/2
			Library	-	1	-
				Total	**30**	**25/27**
II	Core VIII	PCSM214	Big Data Analytics	PCSM315	4	3
	Core IX	PCSM215	Machine Learning	-	4	4
	Core X	PCSM216	Blockchain Technology	-	4	3
	Core XI	PCSM217	Software Testing	PCSM211	4	3
	Core XII	PCSR208	Big Data Analytics – Practical	PCSR306	4	3
	Core XIII	PCSR209	Machine Learning using Google CoLab – Practical	-	4	3
	Non Major Elective	PALE201/ PALE301		-	5	4
	Service Learning	PCSX201/ PCAX201		-	-	1
			Library	-	1	-
				Total	**30**	**24**

Semester	Category		Course Code	Course Title	Previous Course Code	Contact Hrs/ Week
III	Core XIV	PCSM316	Data Science	-	4	4
	Core XV	PCSM317	Augmented Virtual Reality	-	4	4
	Core XVI	PCSM318	Artificial Intelligence and Robotics	PCSM406	4	3
	Core XVII	PCSM313	Research Methodology	-	4	4
	Core XVIII	PCSI301	Fuzzy Set and Systems	-	5	4
	Core XIX	PCSR307	Data Science using Python Pandas - Practical	-	3	2
	Core XX	PCSR308	Augmented Virtual Reality using VRML - Practical	-	3	3
	Core XXI	PCSR303	Project	-	2	2
			Library	-	1	-
				Total	**30**	**24**
IV	Core XXII	PCSM407	Fog computing		5	4
	Core XXIII	PCSM408	Cyber Security	PCSM314	4	3
	Core XIV	PCSP402	Project		20	10
			Library		1	-
				Total	**30**	**17**
				Grand Total	**120**	**90/92**

Minimum one MOOC (Compulsory Audit Course) has to complete during the first year.

EXTRA CREDIT EARNING PROVISION

Semester	Category	Course Code	Course Title	Hrs/Week	Credit	
					Min	Max
III	Self Study Paper	PCSS301/PCAS502	R-Programming	2	-	2
III	Self Study Paper	PCSS302/PCAS503	Rich Internet Applications	2	-	2
IV	Self Study Paper	PCSS401/PCAS601	Silver Light Applications	2	-	2
IV	Self Study Paper	PCSS402/PCAS602	Extreme Programming	2	-	2

COURSES OFFERED TO OTHER DEPARTMENTS (Major and Major Elective)

Course	Semester	Category	Course Code	Course Title	Contact Hrs/Week	Credit
M.A. Tamil	IV	Major Elective	PTAM406	Kanini Payanpattiyal	5	3

NON-MAJOR ELECTIVE

Semester	Category	Course Code	Course Title	Contact Hrs/Week	Credit
II	Non Major Elective	PCSE206	Mobile Computing Practical	5P	4
		PCSE207	Web Based App Development	5P	4

PRINCIPLES OF CONCURRENT PROGRAMMING
PCSM113

Semester : I **Credit: 4**
Category : Major Core I **Hour/Week: 5**
Class &Major : IM.Sc Computer Science **Total Hour: 65**

Objectives:
To enable the students

- Understand the Concepts of Concurrent Programming.
- Design and Build Applications.
- Analyse the Concept and its Associated Package.

Learning Outcomes:
On Completion of the course, the students will be able to

- Understand the Conceptual Foundations of Concurrent Programming.
- Analyse the Effective ways of Structuring Concurrent and Distributed Programs.
- Implement the Concurrent Programming Abstractions Demonstrated by means of Functional Languages.

UNIT – I INTRODUCTION &CONCURRENT PROGRAMMING 13 Hour

Introduction - Concurrency as Abstract Parallelism – Multitasking - The Terminology of concurrency - The Challenge of Concurrent Programming - The Role of Abstraction - Justification of the Abstraction - Atomic Statements – Correctness – Fairness - Volatile and Non-Atomic Variables - Concurrency in Go.

UNIT – II CRITICAL SECTION PROBLEM, VERIFICATION OFCONCURRENT PROGRAMS & ADVANCE ALGORITHMS 13 Hour

The Definition of the Problem - First Attempt - Proving correctness with State Diagrams - Second Attempt, Third Attempt, Fourth Attempt - Dekker's Algorithm - Complex Atomic Statements - Logical Specification of Correctness Properties - Basic and Advanced Concepts of Temporal Logic - A Deductive Proof of Dekker's Algorithm - Spin and the Promela Modeling Language - The Bakery Algorithm - Fast Algorithms.

UNIT – III SEMAPHORES AND MONITORS **13 Hour**

Definition of the Semaphore Type - Semaphore invariants - The Critical Section Problem for N Processes - Definitions of Semaphores - Barz's Simulation of General Semaphores - Udding's Starvation - Semaphores in Go - Monitors - Declaring and using Monitors - Condition variables - The Producer and Consumer Problem - The Problem of the Readers and Writers - Correctness of the Readers and Writers Algorithm - A Monitor Solution for the Dining Philosophers – Monitor in Go.

UNIT – IV CHANNELS, SPACE AND DISTRIBUTED ALGORITHMS **13 Hour**

Models for Communications – Channels - Parallel Matrix Multiplication - Channels in Promela – Rendezvous - The Linda Model - Expressiveness of the Linda Model - Formal Parameters - The Master–Worker Paradigm - Implementations of Spaces - Distributed Algorithms - Implementations - Correctness of the Ricart – Agrawala Algorithm - The RA Algorithm in Promela - Token-Passing Algorithms - Tokens in Virtual Trees.

UNIT – V GLOBAL PROPERTIES, CONSENSUS AND REAL-TIME SYSTEMS **13 Hour**

Global Properties - Distributed Termination - The Dijkstra–Scholten Algorithm - Credit-Recovery Algorithms. Consensus - The Problem Statement - A One-Round Algorithm - The Byzantine Generals Algorithm - Crash failures - Byzantine Failures with Three and Four Generals. Real-Time Systems - Reliability and Repeatability – Synchronous and Asynchronous Systems - The Mars Pathfinder in Spin - Simpson's Four-Slot Algorithm - The Ravenscar Profile – UPPAAL - Scheduling Algorithms for Real-Time Systems.

Text Book

- Ben-Ari, M. (2015). *Principles of Concurrent and Distributed Programming.* Addison-Wesley Publications. (2nd Ed.).

Reference Book

- Gregory, R. Andrews. (2012).*Concurrent Programming Principles and Practice.* Benjamin-Cummings Publishing Co. Inc. Subs. of Addison-Wesley Longman Publications. United States.

DIGITAL IMAGE PROCESSING
PCSM116

Semester : I **Credit: 4**
Category : Major Core II **Hour/Week: 4**
Class & Major: I M.Sc Computer Science **Total Hour:52**

Objectives:
To enable the students

- Understand the Techniques of Processing Images in Different File Formats.
- Examine Different Image Enhancement and Segmentation Techniques.
- Implement Fundamental Image Processing Techniques with OpenCV.

Learning Outcomes:
On Completion of the course, the students will be able to

- Apply Image Enhancement and Restoration Techniques.
- Use Image Compression and Segmentation Techniques.
- Apply Hough Transform for Line, Circle, and Ellipse Detections.

UNIT - I INTRODUCTION **10 Hour**

Introduction - What is Image Processing- Examples of Fields that uses DIP Fundamentals Step in DIP. Digital Image Fundamentals – Image Sensing and Acquisition, Image Sampling and Quantization – Basic relationship between Pixels.

UNIT- II IMAGE ENHANCEMENT **10 Hour**

Spatial Domain - Gray level transformations - Histogram processing - Spatial filtering - Smoothing and Sharpening - Frequency Domain: Filtering in Frequency Domain - DFT, FFT, DCT - Smoothing and Sharpening Filters - Homomorphic Filtering.

UNIT–III IMAGE COMPRESSION AND IMAGE SEGMENTATION **10 Hour**

Compression Methods: Huffman Coding – Arithmetic Coding – LZW Coding – Run Length Coding – Bit-Plane coding. EdgeLinking and Boundary Detection - Thresholding - Region Based Segmentation - Morphological Watersheds - Motion Segmentation, Feature Analysis and Extraction.

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UNIT - IV INTRODUCTION TO OPENCV **11 Hour**

An Introduction to OpenCV – Structure of OpenCV- Reading and Writing Image and Video Files. Image Processing Tools: BasicData Types-Pixel-Level Access-Common Operations with Images Arithmetic Operations-Histograms. Correcting and Enhancing Images: Image Filtering –Smoothing, Sharpening, Working with Image Pyramids. Morphological Operations - Geometric Transformation.

UNIT - V IMAGE PROCESSING IN OPENCV **11 Hour**

Processing Color:-Color Spaces- Conversion between Color Spaces (cvt Color) RGB, Grayscale, YCrCb and HSV. Image Processing for Video: Video stabilization- Super resolution. Computational Photography: High-dynamic-range images-Creating HDR images - Tone mapping - Seamless cloning-Decolorization.

CASE Study: Exploring Structure from Motion Using OpenCV - Number Plate Recognition Using SVM and Neural Networks- Face Recognition using Eigen Faces or Fisher Faces.

Text Books

- Rafael, C. Gonzalez. Richard, E. Woods. (2017). *Digital Image Processing*. (4thEd). Pearson/Prentice Hall.
- Gloria Bueno Garcia. Oscar Deniz Suarez. (2015). *Learning Image Processing with OpenCV*. Packet Publishing Ltd. (1st Ed).

Reference Books

- Rafael C. Gonzalez. Richard, E. Woods. (2017). *Digital Image Processing*. Global Edition. PHI/Pearson Education. (4th Ed.)
- Rafael, C. Gonzalez. Richard, E. Woods. Steven, L. Eddins. *Digital Image Processing Using MATLAB*. (2nd Ed.).McGraw Hill Education.

e-Resources

- http://www.w3schools.com.
- http://www.youtube.com
- http://www.nptel.ac.in/courses/106105032/

TCP/IP NETWORKS

PCSM117

Semester : II **Credit : 4**
Category : Core VIII **Hour/Week : 5**
Class &Major: I M.Sc Computer Science **Total Hour :65**

Objectives:
To enable the students

- Understand the Concepts of TCP/IP.
- Examine the Process of TCP/IP.
- Implement TCP/IP Concepts in Network.

Learning Outcomes:
On Completion of the course, the students will be able to

- Apply Programming Skills in TCP/IP Network Model.
- Understand and Configure IP Addresses.
- Analyse of Data Traffic on TCP/IP Networks.

UNIT- I INTRODUCTION **13 Hour**

Internetworking Concepts and Architectural Model- Classful Internet Addresses – CIDR-Subnetting and Supernetting –ARP- RARP- IP – IP Routing –ICMP – Ipv6.

UNIT - II TCP **13 Hour**

Services – Header – Connection Establishment and Termination- Interactive Data Flow- Bulk Data Flow- Timeout and Retransmission – Persist Timer - Keepalive Timer- Futures and Performance.

UNIT- III IP IMPLEMENTATION **13 Hour**

IP Global Software Organization – Routing Table- Routing Algorithms-Fragmentation and Reassembly- Error Processing (ICMP) –Multicast Processing (IGMP).

UNIT - IV TCP IMPLEMENTATION - I **13 Hour**

Data Structure and Input Processing – Transmission Control Blocks- Segment Format-Comparison-Finite State Machine Implementation-Output Processing- Mutual Exclusion-Computing the TCP Data Length.

UNIT- V TCP IMPLEMENTATION - II **13 Hour**

Timers-Events and Messages- Timer Process- Deleting and Inserting Timer Event- Flow Control and Adaptive Retransmission-Congestion Avoidance and Control – Urgent Data Processing and Push Function.

Text Books

- Douglas, E. Comer. (2013). *Internetworking with TCP/IP Principles- Protocols and Architecture*-Vol.1 & 2. (6th Ed.). Pearson Education Asia.(Unit I in Comer Vol. I- Units II- IV & V – Comer Vol. II).
- Richard Stevens, W.(2011).*TCP/IP Illustrated.* (Volume 1- 6thEd.). Pearson Education. (Unit II).

Reference Books

- Forouzan. (2003). *TCP/IP Protocol Suite*. (2nd Ed.). TMH.
- Richard Stevens, W. (2003). *TCP/IP Illustrated*- Volume 2- Pearson Education.

COMPILER DESIGN

PCSM118

Semester : I **Credit : 4**
Category : Major Core IV **Hour/Week: 4**
Class & Major: I M.Sc Computer Science **Total Hour: 52**

Objectives:

To enable the students

- Understand the concept of Data Structure and Algorithm Design.
- Analyze the Context-Free Grammars, Lexical Analysis and Parsing Techniques**.**
- Implement the Process of Translating a Modern High-Level Language to Executable Code Required for Compiler Construction.

Learning Outcomes:

On Completion of the course, the students will be able to

- Acquire Knowledge of Modern Compiler & its Features.
- Learn & use Modern tools and Technologies for Designing New Compiler.
- Implement the Knowledge of Patterns, Tokens & Regular Expressions.

UNIT – I INTRODUCTION TO COMPILERS **10 Hour**

Structure of a Compiler – Lexical Analysis – Role of Lexical Analyzer – Input Buffering – Specification of Tokens – Recognition of Tokens – Lex – Finite Automata – Regular Expressions to Automata – Minimizing DFA.

UNIT – II SYNTAX ANALYSIS **12 Hour**

Role of Parser – Grammars – Error Handling – Context-Free Grammars – Writing a grammar, Top-Down Parsing – General Strategies Recursive Descent Parser – Predictive Parser-LL(1) Parser-Shift Reduce Parser-LR Parser-LR (0) Item Construction of SLR Parsing Table - Introduction to LALR Parser – Error Handling and Recovery in Syntax Analyzer-YACC.

UNIT – III INTERMEDIATE CODE GENERATION **10 Hour**

Syntax Directed Definitions- Evaluation Orders for Syntax Directed Definitions- Intermediate Languages: Syntax Tree- Three Address Code- Types and Declarations- Translation of Expressions- Type Checking.

UNIT – IV RUN-TIME ENVIRONMENT AND CODE GENERATION **10 Hour**

Storage Organization- Stack Allocation Space- Access to Non-local Data on the Stack-Heap Management – Issues in Code Generation – Design of a Simple Code Generator.

UNIT –V CODE OPTIMIZATION **10 Hour**

Principal Sources of Optimization – Peep-Hole Optimization – DAG- Optimization of Basic Blocks-Global Data Flow Analysis – Efficient Data Flow Algorithm.

Text Books

- Godfrey Winster, S. Aruna Devi, R. Sujatha. (2018). *Compiler Design.* Yesdee Publications.
- Sudharani, S. Karthi Mand Rajkumar. Y. (2019). *Compiler Design.*.I.K.International.

Reference Book

- Aho, A.V. Monica, R. Sethi, J.D. Ullman. (2018). *Compilers, Principles, Techniques and Tools.* Pearson Education/Addison Wesley.

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MOBILE COMPUTING

PCSM119

Semester :I **Credits: 4**
Category : Major Core V **Hour/Week :4**
Class &Major: I M.Sc. Computer Science **Total Hour:52**

Objectives:
To enable the students

- Learn the Basic Concepts of GSM, SMS, and GPRS Architecture.
- Acquire Knowledge of Wireless Protocols -WLN, Bluetooth, WAP, Zig Beeissues.
- Implement the Concepts of Mobile Application Development Platform.

Learning Outcomes:
On Completion of the course, the students will be able to

- Understand the Infrastructures and Technologies of Mobile Computing Technologies.
- Impart Knowledge on Principles and Theories of Mobile computing Technologies.
- Analyse the Future of Mobile Computing Technologies and Applications.

UNIT- I WIRELESS COMMUNICATION FUNDAMENTALS ARCHITECTURE 10 Hour

Frequency Spectrum-Multiplexing-Spread Spectrum-GSM vs CDMA --Comparison of 2G, 3G, 4G -GSM Architecture-Entities-Call Routing-Address and Identifiers-GSM Protocol Architecture-Mobility Management-Frequency Allocation-Security –GPRS Architecture (Entity and Protocol).

UNIT- II MOBILE WIRELESS SHORT RANGE NETWORKS 10 Hour

Introduction-WLAN Equipment-WLAN Topologies-WLAN Technologies-IEEE 802.11 Architecture-WLAN MAC-Security of WLAN, Power Management-Standards-WAP Architecture-Bluetooth Enabled Devices Network-Layers in Bluetooth Protocol-Security in Bluetooth-IrDA-ZigBee.

UNIT- III MOBILE IP NETWORK LAYER, TRANSPORT LAYER 10 Hour

IP and Mobile IP Network Layer-Packet delivery and Handover Management-Location Management-Registration-Tunneling and Encapsulation-Route Optimization-Mobile Transport Layer-Conventional TCP/IP Transport Layer Protocol-Indirect, Snooping, Mobile TCP.

UNIT- IV MOBILE APPLICATION DEVELOPMENTUSING ANDROID 11 Hour

Mobile Applications Development -Understanding the Android Software Stack –Android Application Architecture –The Android Application Life Cycle –The Activity Life Cycle-Creating Android Activity -Views-Layout -Creating User Interfaces with basic Views-Linking Activities with Intents.

UNIT -V MOBILE APPLICATION DEVELOPMENT USING ANDROID 11 Hour

Services-Broadcast Receivers –Adapters –Data Storage, Retrieval and Sharing-Location Based Services-Development of Simple Mobile Applications.

Text Books

- Asoke, K. Talukder. Hasan Ahmed. Roopa, R. Yavagal. (2010). *Mobile Computing*. Tata McGraw Hill Pub. (2nd Ed.)
- Barry, A. Burd. (2015). *Android Application Development for Dummies All in One*. Wiley.
- Ed, Burnette. Hello. (2012). *Android: Introducing Google's Mobile Development Platform*. (3rd Ed.). Pragmatic Programmers.

Reference Books

- Maritn, Sauter. (2011). *From GSM to LTE: An Introduction to Mobile Networks and Mobile Broadband*. John Wiley and Sons.
- Raj Kamal. (2012). *Mobile Computing*. Oxford Higher Education. (2nd Ed.).

DIGITAL IMAGE PROCESSING – PRACTICAL

PCSR107

Semester : I **Credit: 3**
Category : Major Core VI **Hour/Week: 4**
Class & Major: I M.Sc. Computer Science **Total Hour :52**

Objectives:

To enable the Students

- Develop Image Enhancement Techniques
- Design Algorithms to Solve Image Processing Problems
- Implement the Image Fundamentals and Mathematical Transforms.

Learning Outcomes:

On Completion of the course, the students will be able to

- Understand an Image Transformation and its Histogram.
- Apply Image Enhancement and Restoration Techniques.
- Implement Image Compression and Segmentation Techniques.

LIST OF PROGRAMS

1. Convert Color Image into Gray Scale Image.
2. Image Transformation using Fourier Transformation.
3. Histogram Equalization to Improve the Contrast of Images.

4. Water Shed Algorithm for Marker-based Image Segmentation.
5. Erosion and Dilation Operation in Image.
6. Sobel Filter in Edge Detection Method in Image
7. Canny Edge Detection method in Image.
8. Opening and Closing Operation in Image.
9. Hit and Miss Transformation in Morphological Image.
10. To find Objects in an Image using Template Matching Concepts

TCP/IP NETWORKS PRACTICAL
PCSR108

Semester : I **Credit : 2**
Category : Major Core VII **Hour/Week : 3**
Class & Major: I M.Sc. Computer Science **Total Hour :39**

Objectives:
To enable the Students
- Implement Basic Concepts of TCP /IP Network.
- Develop Programs with Packet Tracer Software.
- Have Hands on Experience on Various Networking Commands.

Learning Outcomes:
On Completion of the course, the students will be able to
- Apply Programming Skills in TCP/IP Network Model.
- Understand and Configure IP Addresses.
- Analyse of Data Traffic on TCP/IP Networks.

LIST OF PROGRAMS
1. Socket Program for
    a. Ping Command in Java.
    b. TRACEROUTE command in Java
2. Implementation of IP address Configuration
3. Implementation of
    a. Stop and Wait Protocol
    b. Sliding Window Protocol
4. Simulation of ARP /RARP Protocols
5. Socket Program for NSlookupCommand in Java.
6. Simulation of Error Correction Code (like CRC).
7. Simulation of DNS using UDP Sockets

8. Implementation of TCP (like Packet Capturing and Filtering)
9. Implementation of
    a. go-back-n Protocol
    b. Selective Repeat Protocol.
10. Study of Wire Shark Tool for SDN and Hypervisor for Network.

BIG DATA ANALYTICS

PCSM214

Semester : II **Credit: 3**
Category : Core VIII **Hour / Week : 4**
Class & Major: I M. Sc Computer Science **Total Hour : 52**

Objectives
To enable the students

- Understand the Concepts in Big Data and Apply Hadoop Ecosystem Components.
- Get Introduced to Tools like Pig, Hive, HBase, Elastic MapReduce etc.
- Realize the Hadoop Architecture and Implementation of MapReduce Application.
- Acquire Knowledge on Variety of NoSQL Databases.

Learning Outcomes:
On Completion of the course, the students will be able to

- Ability to Identify the Characteristics of Datasets and Compare the Trivial Data and Big Data for Various Applications.
- Ability to Solve Problems Associated with Batch Learning and Online Learning, and the Big data Characteristics.
- Ability to Integrate Machine Learning Libraries and Mathematical and Statistical Tools with Modern Technologies like Hadoop and Map reduce.

UNIT – I BIG DATA & HDFS **10 Hour**

Big Data Definition and Taxonomy – Challenges for Processing Big Data - Technologies Support Big Data - Big Data Value for the Enterprise – Setting up the Environment – First Step with the Hadoop Ecosystem. HDFS Architecture – HDFS Concepts – Blocks – Name Node – Secondary Name Node – Data Node – HDFS Federation – Basic File System Operations – Data Flow – Anatomy of File Read – Anatomy of File Write.

UNIT – II HADOOP **10 Hour**

Introduction to Hadoop – History of Hadoop – Hadoop Architecture Concepts- Components of Hadoop – Applications of Hadoop – Advantages/Disadvantages of Hadoop - Compression – Security – Enterprise Integration in Hadoop. Use cases of Hadoop – RDBMS vs Hadoop – Ecosystem Tour – Vendor comparison.

UNIT – III PIG **11 Hour**

Introduction to Apache Pig – Map Reduce Vs. Apache Pig – SQL vs. Apache Pig – Different Data Types in Pig – Modes of Execution in Pig – Execution Mechanism- Local Mode- Map Reduce or Distributed Mode – Grunt Shell – Loading data – Exploring Pig – Latin commands - Embedded - Transformations in Pig - How to Write a Simple Pig Script - How to Develop the Complex Pig Script - Bags, Tuples and fields in PIG - UDFs in Pig - Need of using UDFs in PIG.

UNIT – IV HIVE AND HBASE **10 Hour**

Hive Introduction – Hive Architecture – Hive vs RDBMS – HiveQL and the Shell - Managing Tables (External vs Managed) – Data Types and Schemas – Partitions and Buckets.
HBASE: Architecture and Schema Design - HBase vs. RDBMS- HMaster and Region Servers- Column Families and Regions- Write Pipeline- Read pipeline- HBase Commands.

UNIT – V FRAMEWORKS AND APPLICATIONS **10 Hour**

IBM for Big Data – Map Reduce Framework – Algorithms using Map Reduce - Map Reduce Types and Formats- Map Reduce Features- Sharding – NoSQL Databases - S3– Hbase – Impala – Analyzing Big Data with Twitter – Big Data for E-Commerce – Big Data for Blogs.

Text Books

- Michael, Berthold. David, J. Hand. (2007). *Intelligent Data Analysis*. Springer.
- Anand Rajaraman and Jeffrey David Ullman. (2012). *Mining of Massive Datasets*. Cambridge. University Press.
- Paul Zikopoulos. Chris Eaton. Paul Zikopoulos. (2012). *Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data*. McGraw Hill.

Reference Books

- Jay Liebowitz. (2013). *Big Data and Business Analytics.* Auerbach Publications. CRC Press.
- EMC. (2015). *Education Services*, *Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data*. (1st Ed.).
- Arvind, Sathi. (2012). *Big Data Analytics: Disruptive Technologies for Changing the Game*. MC Press.

E-Resources

- http://postscapes.com
- http://www.bigdataanalysis.eu/what-is-bigdata

MACHINE LEARNING

PCSM215

Semester : II **Credit: 4**
Category : Major Core IX **Hour/Week: 4**
Class &Major : I M.Sc Computer Science **Total Hour: 52**

Objectives:

To enable the students

- Understand the Underlying Mathematical Relationships Across Various Machine Learning Algorithms.
- Analyse the Supervised, Unsupervised Machine Learning Approaches.
- Design and Implement Machine Learning Algorithms to Real World Applications.

Learning Outcomes:

On Completion of the course, the students will be able to

- Understand a Wide Variety of Learning Algorithms.
- Develop Learning Models from Data.
- Evaluate Models Generated from Data.

UNIT- I INTRODUCTION **10 Hour**

Concept of Machine Learning, Applications of Machine Learning, Key elements of Machine Learning, Supervised vs. Unsupervised Learning.

UNIT- IISUPERVISED LEARNING ALGORITHMS **11 Hour**

Learning a Class from Examples, Linear, Non-Linear, Multi-Class and Multi-Label Classification, Decision Trees: ID3, Classification and Regression Trees (CART), Regression: Linear Regression, Multiple Linear Regression, Logistic Regression.

UNIT- IIIADVANCED SUPERVISED LEARING ALGORITHMS **10 Hour**

Neural Networks: Introduction, Perceptron, Multilayer Perceptron, Support Vector Machines: Linear and Non-Linear, Kernel Functions, K-Nearest Neighbors.

UNIT- IV UNSUPERVISED ALGORITHM **11 Hour**

Introduction to Clustering, Hierarchical: AGNES, DIANA, Partitional: K-means Clustering, K-Mode Clustering, Self-Organizing Map, Expectation Maximization, Gaussian Mixture Models, Principal Component Analysis (PCA).

UNIT- V PROBABILISTIC LEARNING **10 Hour**

Bayesian Learning, Bayes Optimal Classifier, Naïve Bayes Classifier, Mining Frequent Patterns.

Text Books

- Ethem Alpaydin. (2014). *Introduction to Machine Learning.* MIT Press. Prentice Hall of India. (3rd Ed.)
- Mehryar Mohri, Afshin Rostamizadeh, Ameet Talwalkar. (2012).*Foundations of Machine Learning.* MIT Press.
- Tom, M. Mitchell. (2013). *Machine Learning*. Tata McGraw-Hill Education.(1st Ed.).

Reference Books

- Mevin, P. Murphy. (2012). *Machine Learning: A Probabilistic Perspective*. The MIT Press.
- Christopher, M. Bishop. (2007).*Pattern Recognition and Machine Learning*. Springer.

BLOCKCHAIN TECHNOLOGY

PCSM216

Semester : II **Credit: 3**
Category : Major Core X **Hour/Week: 4**
Class &Major :I M.Sc Computer Science **Total Hour: 52**

Objectives:

To enable the students

- Acquire Knowledge on Types of Blockchain Technologies.
- Understand the Concept of Private and Public Blockchain
- Analyse Security and Applications in Blockchain Technology.

Learning Outcomes:

On Completion of the course, the students will be able to

- Evaluate Blockchain Technologies, their core Components, Protocols, and use Cases.
- Design and Build Blockchain Applications.
- Inculcate the State of the art and Emerging use cases of Blockchain.

UNIT- I FUNDAMENTALS OF BLOCK CHAIN **10 Hour**

Introduction - Origin of Blockchain - Blockchain Solution - Components of Blockchain - Components of Blockchain - Block in Blockchain - The Technology and the Future.

UNIT- II BLOCKCHAIN TYPES AND CONSENSUS MECHANISM **11 Hour**

Introduction - Decentralization and Distribution - Types of Blockchain - Consensus Protocol - CRYPTOCURRENCY - BITCOIN, ALTCOIN and TOKEN: Introduction - Bitcoin and Cryptocurrency Basics - Types of Cryptocurrency - Cryptocurrency Usage.

UNIT-III PUBLIC BLOCKCHAIN SYSTEM **10 Hour**

Introduction - Public Blockchain - Popular Public Blockchains - The Bitcoin Blockchain– Etherum Blockchain.

UNIT- IV PRIVATE BLOCKCHAIN SYSTEM **11 Hour**

Introduction - Key Characteristics of Private Blockchain - Private Blockchain Examples - Private Blockchain and Open Source - E-Commerce Site Examples - Various Commands in E-Commerce Blockchain - Smart Contract in Private Environment - State Machine - Different Algorithms of Permissioned Blockchain - Byzantine Fault - Multichain

UNIT- V SECURITY IN BLOCKCHAIN **10 Hour**

Introduction - Security aspects in Bitcoin - Security and Privacy Challenges of Blockchain in General - Performance and Scalability - Identity Management and Authentication - Regularity Compliance and Assurance - Safeguarding Blockchain Smart Contract - Security Aspects in Hyper ledger Fabric.

Case Study: APPLICATIONS OF BLOCKCHAIN: Blockchain in Banking and Finance - Blockchain in Healthcare.

Text Book

- Chandramouli Subramaniam, Asha, A. George, Abhilash, K. A, Meera Karthikeyan. (2020). *Blockchain Technology* . University Press.

Reference Books

- Daniel Drescher, (2017). *Blockchain Basics: A Non-Technical Introduction.* Apress.
- Debajani Mohanty. (2018*). Blockchain From Concept to Execution BPB*.

E--Resourses

- https://www.pdfdrive.com/blockchain-books.html
- https://www.blockchain.com/

SOFTWARE TESTING

PCSM217

Semester : II **Credit: 4**
Category : Major Core XI **Hour/Week: 4**
Class &Major: I M.Sc Computer Science **Total Hour: 52**

Objectives:

To enable the students

- Acquire Knowledge for Software Testing.
- Analyse Quality Assurance and Control.
- Evaluate the Quality of Project.

Learning Outcomes:

On Completion of the course, the students will be able to

- Create test Strategies and Plans, Design Test Cases, Prioritize and Execute them.
- Apply Modern Software Testing Processes in relation to Software Development.
- Manage Incidents and Risks within a Project.

UNIT- I INTRODUCTION **11 Hour**

Introduction to Quality - Historical Perspective of Quality - Definitions of Quality - Core Components of Quality - Quality View - Customer, Suppliers and Processes - The Purpose of Testing. Basic Concepts of Software Testing: Introduction - Definition of Testing - Basic Principles of Testing - Work Bench - Test Policy - Test Strategy - Developing Test Strategy - Test Methodologies.

UNIT II TEST CASE DESIGN STRATEGIES **11 Hour**

Test case Design Strategies – Using Black Box Approach to Test Case Design – Boundary Value Analysis – Equivalence Class Partitioning – State Based Testing – Cause-Effect Graphing – Compatibility Testing – User Documentation Testing – Domain Testing – Random Testing – Requirements Based Testing – Using White Box Approach to Test Design – Test Adequacy Criteria – Static Testing vs. Structural Testing – Code Functional Testing.

UNIT- III VERIFICATION AND VALIDATION **10 Hour**

Software Verification and Validation: Introduction - Verification - Verification Work Bench - Methods of Verification - Types of Review on The Basis of Stage/Phase - Coverage in Verification - Concerns of Verification – Validation - Work Bench – Levels - Acceptance Testing - Software Development Verification and Validation Activities. V-Test Model - Analyzing and Reporting Test Results.

UNIT- IV TESTING TECHNIQUES AND TOOLS **10 Hour**

Testing Techniques and Tools: Levels of Testing - Acceptance Testing: Introduction - Acceptance Criteria - Importance of Acceptance Criteria - Alpha Testing - Beta Testing - Gamma Testing - Acceptance Testing During Each Phase of Software Development - Software Development Methodologies - Developing Acceptance Plan.

UNIT-V TEST AUTOMATION **10 Hour**

Software test automation – skills needed for automation – scope of automation – design and Architecture for Automation – Requirements for a Test Tool – Challenges in Automation – Test Metrics and Measurements – Project, Progress and Productivity Metrics.

Text Book

- Shen,J.J.(2019). *Software Testing: Techniques. Principles, and Practices*.
- Krishna Rungta. (2019). *Software Testing Learn Testing in 1 Day*. Kindle Edition.

Reference Book

- Dr. Anand Nayyar. (2019). In*stant Approach to Software Testing: Principles, Applications, Techniques*, *and Practices*.

BIG DATA ANALYTICS – PRACTICAL

PCSR208

Semester : II **Credits: 3**
Category : Core XII **Hour/Week : 4**
Class & Major : I M.Sc Computer Science **Total/Hour : 52**

Objectives

To enable the students

- Understand Analytical Concepts using PIG
- Gain Knowledge on Higher Level of Abstraction.
- Develop Programming Skills using HIVE Commands.

Learning Outcomes:

On Completion of the course, the students will be able to

- Perform Data Gathering of Large Data from a Range of Data Sources.
- Critically Analyse Existing Big Data Datasets and Implementations, Taking Practicality, and Usefulness Metrics into Consideration.
- Understand and Demonstrate the Role of Statistics in the Analysis of Large of Datasets.

LIST OF PROGRAMS

1. I/O Operations
2. Split and Union
3. Filters
4. Joins
5. Flattening
6. Sample and Parallel
7. Advanced Relational Operations
8. Perform Basic DDL - DML Operations using Hive Commands.
9. Perform Group by Operations using Hive Command.
10. Perform Order by vs. Sort by Operations using Hive Commands.
11. Demonstrate Join Operations using Hive Commands.
    (i) Left Outer Join (ii) Right Outer Join (iii) Full Outer Join
12. Calling out external program to perform Map and Reduce operations.

MACHINE LEARNING USING GOOGLE COLAB – PRACTICAL

PCSR209

Semester : II **Credit : 3**
Category : Major Core XIII **Hour/Week: 4**
Class & Major : I M.Sc Computer Science **Total Hour:52**

Objectives:

To enable the students

- Understand the Concepts and Techniques of Machine Learning.
- Acquire knowledge in recent Machine Learning Software.
- Implementation of Problem Solving.

Learning Outcomes:

On Completion of the course, the students will be able to

- Apply the Fundamental Concepts in Machine Learning.
- Evaluate the Scikit-Learn API.
- Develop Algorithms for Different Types of Dataset.

LIST OF PROGRAMS

1. Demonstrate the Working of the Decision Tree Based ID3 algorithm. Use an Appropriate Data set for Building the Decision tree and Apply this Knowledge to Classify a New Sample.
2. Apply k-Means Algorithm to Cluster a set of Data stored in a .CSV File.
3. House price Prediction using Linear Regression.
4. Diabetics Prediction using Logistic Regression.
5. Customer Churn Prediction using Decision Tree & Random Forest.
6. Predict Titanic Survivors using Artificial Neural Network Classification.
7. Implement k-Nearest Neighbors Algorithm from Scratch using IRIS Dataset
8. Implement the Naïve Bayesian Classifier for a Sample Training Data Set Stored as a .CSV file.
9. Covid-19 Data Analysis, Visualization Forecasting &Predication using ML
10. Implement Principle Component Analysis for Dimensionality Reduction.

NON-MAJOR ELECTIVE
MOBILE COMPUTING LAB
PCSE206

Semester : II **Credits : 4**
Category : NON MAJOR ELECTIVE **Hour/Week : 5**
Class &Major : I PG **Total Hour : 65**

Objectives:
To enable the students

- Understand the Concepts Mobile Technologies
- Develop and Deploy Effective Mobile Applications.
- Impart Practical Training in Mobile Application Development.

Learning Outcomes:
On Completion of the course, the students will be able to

- Understand the Infrastructures and Technologies of Mobile Computing Technologies.
- Impart Knowledge on Principles and Theories of Mobile Computing Technologies.
- Analyse the Future of Mobile Computing Technologies and Applications.

LIST OF PROGRAMS (Any 10):

1. Create an Application which Deals with the Android Content Providers.
2. Create an Application using Android Layouts, Views and Events.
3. Create an Application which uses Files, Preferences and Notifications.
4. Create an Application to Create, Modify and Query an SQLite Database.
5. Create an Application for Querying Web services and Parsing response.
6. Create an Application which uses the concept of Services and Background Threats.
7. Creating Android Audio Video Application.
8. Create an Application which uses Map Activity and points the locations onto the Map Locations.
9. Create an Application with One-Time, Repeating Alarms, and Long-Running Background Task as Service.
10. Create an Application for Simple Mobile Game.
11. Develop an Application that uses GUI Components, Font and Colours.
12. Develop an Application that uses Layout Managers and Event Listeners.
13. Develop a Native Calculator Application.
14. Write an Application that Draws Basic Graphical Primitives on the Screen.
15. Develop an Application that makes use of Database.

16. Implement an Application that implements Multi Threading.
17. Develop a native Application that Uses GPS Location Information.
18. Implement an Application that Writes Data to the SD Card.
19. Implement an Application that creates an alert upon Receiving a Message.
20. Write a mobile Application that creates Alarm Clock.

WEB BASED APPLICATION DEVELOPMENT -LAB

PCSE207

Semester : II **Credit : 4**
Category : NME **Hour/Week :5P**
Class &Major : I PG **Total Hour :65**

Objectives:
To enable the students

- Understand the Concepts and Techniques of Web Development.
- Acquire Knowledge of RecentWeb Pages.
- Design and Implement JavaScript for Developing Web Site.

Learning Outcomes:
On Completion of the course, the students will be able to

- Understand the Fundamental Concepts of XHTML.
- Develop the Web Pages using Cascading Style Sheets.
- Publisha Web site using Java Scripts**.**

LIST OF PROGRAMS

1. XHTML and Web Pages
    a. Working with Text.
    b. Working with Lists, Tables and Frames.
    c. Working with Hyperlinks.
    d. Working with Images and Multimedia.
    e. Working with Forms and controls.
2. Cascading Style Sheets
    a. Styles (Background, Text Format, Controlling Fonts)
    b. Color Scheme
    c. Working with Block Elements and Objects
    d. Working with Lists and Tables
    e. Creating page Layout and Site Designs
3. Introduction to Web Publishing or Hosting
    a. Creating the Web Site
    b. Saving the Site
    c. Working on the Web site
    d. Creating Web site Structure
    e. Creating Titles for Web Pages

f. Themes-Publishing web sites

4. Introduction to Java scripts
    a. Processing HTML Forms
    b. Conditions and Math Objects
    c. Loops and Arrays
    d. Return Functions and More Arrays
    e. Time Object and Image Roller
5. Introduction to Javascripts
    f. Processing HTML Forms
    g. Conditions and Math Objects
    h. Loops and Arrays
    i. Return Functions and More Arrays
    j. Time Object and Image Roller

III & IV EVALUATION COMPONENTS OF CIA

Semester	Category	Course Code	Course Title	Component III	Component IV
I	Core I	PCSM113	Principles of Concurrent Programming	Assignment	Seminar
	Core II	PCSM116/ PCSM404	Digital Image Processing	Assignment	Seminar
		PCSM117	TCP / IP Networks	Working Model	Seminar
	Core IV	PCSM118	Compiler Design	Problem Solving	Seminar
	Core V	PCSM119	Mobile Computing	Assignment	Seminar
	Core VI	PCSR107	Digital Image Processing – Practical	DPA	DPA
	Core VII	PCSR108	TCP/IP Networks – Practical	DPA	DPA
II	Core VIII	PCSM214	Big Data Analytics	Assignment	Seminar
	Core IX	PCSM215	Machine Learning	Assignment	Seminar
	Core X	PCSM216	Block Chain Technology	Assignment	Seminar
	Core XI	PCSM217	Software Testing	Working Model	Seminar
	Core XII	PCSR208	Big Data Analytics – Practical	DPA	DPA
	Core XIII	PCSR209	Machine Learning using Google CoLab – Practical	DPA	DPA

NON-MAJOR ELECTIVE

Semester	Category	Course Code	Course Title	Component III	Component IV
II	Non- Major Electives	PCSE206	Mobile Computing Practical	DPA	Viva voce
		PCSE207	Web Based Application Development Lab	DPA	Viva voce

DEPARTMENT OF COMPUTER APPLICATIONS

PREAMBLE

UG : Programme Profile, list of Courses Offered to the other Departments and the Syllabi of Courses in the I & II Semesters along with Evaluation Components III & IV (With Effect from 2021-2024 Batch Onwards)

PROGRAMME PROFILE BCA

(LEARNING OUTCOMES-BASED CURRICULUM FRAMEWORK)

PSO1 : Understanding of the Key Concepts and Principles of Programming Languages.

PSO2 : Capacity to Analyze a Problem, Identify the Computing Requirements and using Procedures find a Solution.

PSO3 : Development of Practical Skills to Solve Problems and Provide Solutions using Current Trends in the Discipline of Computer Applications.

PSO4 : Ability to apply the Algorithmic Principles, Mathematical Foundations and Computer Science Theory for Designing Computer-Based Systems.

Semester	Part	Category	Course Code	Course Title	Previous Course Code	Contact Hrs/ Week	Credit Min/Max
I	I	Language	UTAL107/ UTAL108	Languages/ AECC-II Tamil-I/ Hindi-I/French-I (2 Levels)	UTAL105/ UTAL106/ UHIL101/ UFRL101	5	3/4
	II	English	UCEL101/ UCEL102	Communicative English-/ English/AECC-I (2 Levels)	UENL107/ UENL108	5	3/4
	III	Major Core (DSC) - I	UCAM110	Principles of Information Technology	-	5	4
	III	Major Core (DSC) - II	UCAM111/ UCSM109	Programming Methodology	-	4	4
	III	Major Core (DSC) - III	UCAR106/ UCSR110	Programming Methodology - Practical	-	3	2
	III	Allied (GE) - I	UMAA110	Mathematical Methods I	-	6	4
	III	Professional English	UPEM101	Professional English I	-	6	4
	IV	Value Education (SEC)				2	1
Total						**30**	**25/27**

Semester	Part	Category	Course Code	Course Title	Previous Course Code	Contact Hrs/ Week	Credit Min/Max
II	I	Language	UTAL207/ UTAL208	Languages/ AECC-II Tamil-II/ Hindi-II/French-II (2 Levels)	UTAL205/ UTAL206/ UHIL201/ UFRL201	5	3/4
	II	English	UCEL201/ UCEL202	Communicative English-/ English/AECC-I (2 Levels)	UENL207/ UENL208	5	3/4
	III	Major Core (DSC) - IV	UCAM206/ UCSM207	Data Structures	UCAM205	4	4
	III	Major Core (DSC) - V	UCAM207/ UCSM208	Python Programming	UCAM407	4	4
		Major Core (DSC) - VI	UCAR205/ UCSR207	Data Structures using Python - Practical	-	3	2
	III	Allied (GE) - II	UMAA216	Mathematical Methods-II	-	6	4
	III	Professional English	UPEM201	Professional English II	-	6	4
	IV	NME(Skill Enhancement Course)				3	2
	IV	Soft skill				2	1
	V	Extension Programme / Physical Education/NCC				-	1/2
Total						**30**	**28/31**
III	III	Major Core (DSC) - VII	UCAM310/ UCSM305	Java Programming	UCAM307	5	4
	III	Major Core (DSC) - VIII	UCAM312	Software Engineering	UCAM509	5	4
	III	Major Core (DSC) - IX	UCAM311	Data Communication Networks	UCAM309/ UCAM405	5	4
	III	Major Core (DSC) - X	UCAR304/ UCSR308	Java Programming - Practical	UCAR303	4	2
	III	Allied (GE) - III	UCOA303	Financial Accounting	-	6	4
	IV	Online course		NPTEL/Spoken Tutorial/Swayam		3	1/2
	IV	Value Education				2	1
Total						**30**	**20/21**
IV	III	Major Core (DSC) - XI	UCAM404	Database Management System	-	4	4
	III	Major Core (DSC) - XII	UCAM408	Operating System	UCAM507	5	4
	III	Major Core (DSC) - XIII	UCAM403	Object Oriented Analysis and Design	-	4	4
	III	Major Core (DSC) - XIV	UCAR405	Database Modeling - Practical	UCAR402	3	2
	III	Major Core (DSC) - XV	UCAR406	Operating System- Practical	-	3	2

Semester	Part	Category	Course Code	Course Title	Previous Course Code	Contact Hrs/ Week	Credit Min/Max
IV	III	Allied (GE) - V	UCOA403	Accounting Package	-	3	2
	III	Allied (GE) - VI	UCOR403	Accounting Package - LAB	-	3	2
	IV	NME(Skill Enhancement Course)				3	2
	IV	Soft skill				2	1
	V	Extension Programme/ Physical Education				-	1/2
Total						**30**	**24/25**
V	III	Major Core (DSC) - XVI	UCAM510	Cloud Computing	UCAO604	4	4
	III	Major Core (DSC) - XVII	UCAM511	R Programming	-	4	4
	III	Major Core (DSC) - XVIII	UCAM508	Open Source Technology	UCAM501	4	4
	III	Major Core (DSC) - XIX	UCAR506	Open Source Technology - Practical	UCAR504	3	2
	III	Major Core (DSC) - XX	UCAR507	R Programming - Practical	-	3	2
	III	MAJOR ELECTIVE (Discipline Specific Elective) - XXI	UCAO501/ UCAO502/ UCAO503	Computer Ethics/ Artificial Intelligence / Software Testing	-	5	4
		Major Core (DSC) - XXII	UCAP501	Project	UCAP601	5	5
	IV	Value Education				2	1
Total						**30**	**26**
VI	III	Major Core (DSC) - XXIII	UCAM609	Data Mining	UCAM606	5	4
	III	Major Core (DSC) - XXIV	UCAM612	Computer Graphics and Image Processing	UCAM610	5	5
	III	Major Core (DSC) - XXV	UCAM613	Internet of Things	UCAM611	5	4
	III	Major Core (DSC) - XXVI	UCAR603	Data Mining - Practical	UCAR602	4	3
	III	Major Core (DSC) - XXVII	UCAR604	Computer Graphics and Image Processing - Practical	-	4	3
	III	MAJOR ELECTIVE (Discipline Specific Elective) - XXVIII	UCAO607/ UCAO608/ UCAO609	Data Analytics/ Mobile Computing / Network Security	-	5	4
	III	Viva-Voce	UCAM601	Comprehensive Viva Voce	-	-	1
	IV	Soft Skill			-	2	1

Semester	Part	Category	Course Code	Course Title	Previous Course Code	Contact Hrs/ Week	Credit Min/Max
VI	V	Extension Programme/ Physical Education/NCC			-	-	0/2
					Total	**30**	**25/26**
					Grand Total	**180**	**148/156**

EXTRA CREDIT EARNING PROVISION

Semester	Part	Category	Course Code	Course Title	Contact/ Week	Credit	
						Min	Max
II	III	Summer Internship	UCAI201	Summer Internship	-	-	1
IV	III	Summer Internship	UCAI401	Summer Internship	-	-	1
V	III	Self Study	UCAS503	IOT Projects	2	-	2
V	III	Self Study	UCSS502/ UCAS502	Android Applications	2	-	2
VI	III	Self Study	UCSS601/ UCAS601	Angular JS	2	-	2
VI	III	Self Study	UCSS602/ UCAS602	Green Computing	2	-	2

NON-MAJOR ELECTIVES-UG

Semester	Part	Category	Course Code	Course Title	Contact/ Week	Credit
II	IV	NME	UCAE207	Data Science using R	3P	2
			UCAE208	Cyber Forensics	3T	2
			UCAE209	PyMOL	3P	2
			UCAE210	Qlik View	3P	2
			UCAE211	Internet Lab	3P	2
			UCAE212	Data Analytics Tools	3P	2
IV	IV	NME	UCAE401	Multimedia Programming	3P	2
			UCAE402	MATLAB Programming	3P	2
			UCAE403	Mobile App Development	3P	2

Inclusion of Experiential Learning

A. Experiential Learning (Mandatory)

Course Mapping				Collaborating Agency - MSME		
Semester	**Course Code**	**Course Title**	**Assessment**	**Course Title**	**Hour/Days/ Month**	**Mode of Evaluation**
II	UCAM310	Java Programming	Component III	Java Programming	4 Days	Reflection
II	UCAM407	Python Programming	Component III	Python Programming Training	4 Days	Reflection
III	UCAM505	Web Programming	Component III	Web designing Certification	4 Days	Reflection
III	UCAM610	Computer Graphics	Component III	Computer Graphics Certification	4 Days	Reflection

B. Skill Orientation Programme (Only for Interested students) – Extra Credit Earning Provision

Semester	Category	Course Code	Course Title	Collaborating Agency	Hour/ Days/Month	Mode of Evaluation	Credits (Min/Max)
V	Core	UCAT501	Excel Analytics with R-Language	**MSME**	4 Days	Reflection	1

PRINCIPELS OF INFORMATION TECHNOLOGY

UCAM110/UCSM108

Semester : I **Credit : 4**
Category : Major Core (DSC) - I **Hour/Week: 5**
Class &Major : I BCA **Total Hour: 65**

Objectives:

To enable the Students

- Obtain Knowledge on Object Oriented Programming concepts.
- Understand the Basics of Microprocessor and Compiler.
- Acquire Knowledge on Information Security and Open Source Software.

Learning Outcomes:

On Completion of the course, the students will be able to

- Develop Logic for Assembly Language Programming.
- Analyze the Performance of Commercially Available Computers.
- Examine the Construction of CPU, Know Registers and Bus Systems.

UNIT - I PROGRAMMING LANGUAGES **13 Hour**

Introduction - Evolution of Programming Languages- Classification of Programming Languages - Generations of Programming Languages - Features of a Good Programming Language- Selection of a Programming Language

UNIT - II FUNDAMENTALS OF COMPUTER ARCHITECTURE **13 Hour**

Introduction- Central Processing Unit (CPU) Memory- Communication between Various Units of a Computer System- The Instruction Format- Instruction Set- Processor Speed- Multiprocessor Systems. Primary Memory Introduction- Memory Hierarchy- Random Access Memory (RAM)- Types of RAM- Read Only Memory (ROM)- Types of ROM. Secondary Storage Introduction- Classification of Secondary Storage Devices- Magnetic Tape- Magnetic Disk- Optical Disk- Magneto Optical disk. Input Devices - Output Devices.

UNIT - III MICROPROCESSOR **13 Hour**

Introduction to Microprocessor – Microcontroller - 8085 Microprocessor and Architecture - Opcode fetch - Machine cycle - Memory Read Machine Cycle - Memory Write Machine Cycle - IO Read Machine Cycle - IO Write Machine Cycle - Execution time of the Instruction Cycle.

UNIT - IV INFORMATION SECURITY **13 Hour**

Introduction to Information Security - Components of Information System - Balancing Information Security and Access - The Systems Development Life Cycle - The Security Systems Development Life Cycle - Security Professionals and Organization.

UNIT - V OPEN SOURCE SOFTWARES **13 Hour**

Introduction to Open sources – Need of Open Sources – Advantages of Open Sources – Application of Open Sources. Open Source Operating Systems: LINUX. Introduction: MySQL - PHP – Python.

Text Books

- Arvind Kumar Bansal. (2014). *Introduction to Programming Languages*. CRC PRESS. Taylor and Francis Group.
- Michael, E. Whitman. Herbert, J. Mattord. (2012). *Principles of Information Security.* Course Technology. (4th Ed.). Cengage Learning.
- Alexis, Leon. Mathews Leon. (2009). *Fundamentals of Information Technology.* Vikas Publishing House Pvt. Ltd.
- Rasmus, Lerdorf. Levin, Tatroe. (2012). *Programming in PHP.* Reilly.
- Ramesh, S. Goankar. (2011). *Microprocessor Architecture Programming and Applications with 8085.* Penram International. (5th Ed.).

Reference Books

- Dennis, P. Curtin. Kim Foley. Kunal Sen and Cathleen Morin. (2005). *Information Technology - the Breaking Wave.* Tata-McGraw Hill Publications. (7th Reprint).
- Alexis Leon. Mathews Leon. (2004). *Fundamentals of Information System.* Co-Published by Vijay Nicole Imprints Pvt Ltd.

E-Resource

- http://indexof.es/Computer/Fundamentals%20of%20Computer%20Organization%20and%20Architecture.pdf

PROGRAMMING METHODOLOGY
UCAM111/UCSM109

Semester : I **Credit : 4**
Category : Major Core (DSC) - II **Hour/Week : 4**
Class &Major : I BCA **Total Hour: 52**

Objectives

To enable the Students

- Develop Simple Algorithms and Flow Charts to Solve a Problem.
- Acquire Knowledge on Functions, Arrays and Structures.
- Understand the concepts of File Management.

Learning Outcomes

On Completion of the course, the students will be able to

- Be familiar with Good Programming Practice, and Apply it in various Programs.
- Know about Insecure Functions to be Avoided.
- Understand the Compilation Process in File Concepts.

UNIT – I INTRODUCTION TO PROGRAMMING **10 Hour**

Introduction to Programming, Program Concept, Characteristics of Programming, Stages in Program Development, Algorithms, Notations, Design, Flowcharts, Types of Programming Methodologies, Introduction to C++ Programming - Basic Program Structure In C++, Variables and Assignments, Input and Output, Selection and Repetition Statements.

UNIT – II FUNCTIONS **10 Hour**

Top-Down Design, Predefined Functions, Programmer -Defined Function, Local Variable, Function Overloading, Functions with Default Arguments, Call -By-Value and Call-By-Reference Parameters, Recursion.

UNIT – III ARRAYS, STRUCTURES & UNION **12 Hour**

Introduction to Arrays, Declaration and Referring Arrays, Arrays in Memory, Initializing Arrays. Arrays in Functions, Multi-Dimensional Arrays. Structures - Member Accessing, Pointers to Structures, Structures and Functions, Arrays of Structures, Unions.

UNIT – IV STRINGS **10 Hour**

Declaration and Initialization, Reading and Writing Strings, Arrays of Strings, String and Function, Strings and Structure, Standard String Library Functions.

UNIT – V FILES **10 Hour**

Files- File Streams - Creating File Streams - Open Modes - Closing Files - Reading and Writing Blocks.

Text Books

- Dale, N. and Weems, C. (2010). *Programming and Problem Solving with C++: Brief Edition.* Jones & Bartlett Learning.
- Kenrick Mock (2015). *Problem Solving with C++ / Walter Savitch; Contributor*. (9th Ed.) ISBN-13: 978-0-13-359174-3

Reference Book

- Hanly, J.R. Koffman, E.B. (2015). *Problem Solving and Program Design*. Pearson.

E-Resource

- http://www.lmpt.univ-tours.fr/~volkov/C++.pdf

PROGRAMMING METHODOLOGY - PRACTICAL
UCAR106/UCSM110

Semester : I **Credit : 2**
Category : Major Core (DSC) - III **Hour/Week: 3**
Class &Major : I BCA **Total Hour : 39**

Objectives:

To enable the students

- Acquire Knowledge on Basic Skills Coupled with Top Down Design Principles.
- Develop the Skills for Formulating Iterative Solutions to a Problem.
- Understand the Concepts of File Management.

Learning Outcomes:

On Completion of the course, the students will be able to

- Apply Problem-Solving Knowledge and Skills to Write Effective C++Programs.
- Appreciate the use of Simple Data Structure such as Array, Structures and Unions.
- Identify Opportunities to write Modularized Code.

LIST OF PROGRAMS

1. Arithmetic Operators and Mathematical Expressions
2. Conditional Operators
3. Control Structures – Decision Making
4. Control Structures – Looping
5. Functions and Parameter passing in functions, writing Recursive Programs.
6. Arrays
7. Structures
8. Union.
9. Strings and String Handling Operations.
10. Files for Data Input and Output.

DATA STRUCTURES
UCAM206/UCSM207

Semester : II **Credit: 4**
Category : Major Core (DSC) - IV **Hour/Week: 4**
Class &Major : I BCA **Total Hour: 52**

Objectives:

To enable the Students

- Acquire Knowledge on Basic Operations like Insert, Delete, Search etc.,
- Design Programs using various Data Structures Including Hash Tables, Binary and general Search Trees, Heaps, Graphs etc.
- Know and Implement the Applications of Algorithms for Sorting, Pattern Matching etc.

Learning Outcomes

On Completion of the course, the students will be able to

- Understand and Restate the Fundamentals of Basic Data Structures.
- Implement Basic Data Structures such as Stacks, Queues and Trees.
- Implement the Algorithms for Sorting and Searching.

UNIT – I INTRODUCTION TO ALGORITHM **11 Hour**

Basic Concepts- Algorithm Specification-Introduction, Recursive algorithms, Data Abstraction Performance analysis, Linear and Non-Linear Data Structures, Singly Linked Lists-

Operations, Circularly linked Lists-Operations, Doubly Linked Lists- Operations. Representation of single, Two Dimensional Arrays, Sparse Matrices-Array and Linked Representations.

UNIT - II STACK & QUEUE OPERATIONS **10 Hour**

Stack- Operations, Array and Linked Implementations, Applications- Infix to Postfix Conversion, Postfix Expression Evaluation, Recursion Implementation. Queue- Definition and Operations, Array and Linked Implementations, Circular Queues - Insertion and Deletion Operations.

UNIT - III TREES **10 Hour**

Trees, Representation of Trees, Binary Tree, Properties of Binary Trees, Binary Tree Representations- Array and Linked Representations, Binary Tree Traversals, Threaded Binary Trees, Priority Queue- Implementation, Heap- Definition, Insertion, Deletion.

UNIT - IV GRAPHS **10 Hour**

Graphs, Graph ADT, Graph Representations, Graph Traversals, Searching, Static Hashing- Introduction, Hash tables, Hash functions, Overflow Handling.

UNIT – V SORTING & SEARCHING ALGORITHMS **11 Hour**

Sorting Methods: Bubble Sort – Insertion Sort – Quick Sort – Heap Sort. Searching Trees: Binary Search Trees, AVL Trees- Definition and Examples- Pattern Matching Algorithm.

Text Books

- Michael, T. Goodrich. Roberto Tamassia. Michael, H. Goldwasser. (2013). *Data Structures and Algorithms in Python.* Wiley.
- Dr. Kent, D. Lee, Dr. Steve Hubbard. (2015). *Data Structures and Algorithms with Python.* Springer Nature.
- Rance D. Necaise. (2016). *Data Structures and Algorithms Using Python.*

Reference Books

- Benjamin Baka. Dr Basant Agarwal. (2018). *Hands-On Data Structures and Algorithms with Python.* (2nd Ed.).
- Horowitz, E. Sahni, S. and Susan Anderson-Freed. *Fundamentals of Data Structure*. (2nd Ed.) Universities Press.

E-Resource

- file:///C:/Users/admins/AppData/Local/Temp/Data%20Structures%20and%20Algorithms%20in%20Python%20[Goodrich,%20Tamassia%20Goldwasser%202013-03-18]-1.pdf

PYTHON PROGRAMMING

UCAM207/UCSM208

Semester : II **Credit: 4**
Category : Major Core (DSC) - V **Hour/Week: 4**
Class &Major : I BCA **Total Hour : 52**

Objectives:

To enable the Students

- Acquire Knowledge on Concepts of Functions & Illustrative Programs
- Understand Python Lists, Tuples to represent Compound Data
- Develop and Execute Simple Python Programs.

Learning Outcomes:

On Completion of the course, the students will be able to

- Define and Demonstrate the Use of Built-in Data Structures "Lists" and "Dictionary".
- Design and Implement GUI Application and How to Handle Exceptions and Files
- Implement a Program to Solve a Real World Problem.

UNIT - I INTRODUCTION TO PYTHON **11 Hour**

Introduction to Python: Python, Features of Python, Execution of a Python, Program, Writing Our First Python Program, Data types in Python. Python Interpreter and Interactive Mode; **Values and Types**: int, float, Boolean, String, and List; Variables, Expressions, Statements, Tuple Assignment, Precedence of Operators, Comments; **Modules and Functions**: Function Definition and use, Flow of Execution, Parameters and Arguments.

UNIT – II CONTROL STATEMENTS & FUNCTIONS **10 Hour**

Control Statements: Boolean Values and Operators - Conditional (if), Alternative (if-else), Chained Conditional (if-elif-else); **Iteration**: State, While, for, Break, Continue, Pass; **Fruitful Functions**: Return Values – Parameters - Local and Global Scope -Function Composition -Recursion.

UNIT - III ARRAYS, STRINGS & ILLUSTRATIVE PROGRAMS **11 Hour**

Arrays: Lists as Arrays. **Strings:** String Slices – Immutability - String Functions and Methods - String Module; **Illustrative Programs:** Square Root –GCD – Exponentiation - Sum an Array of Numbers - Linear Search - Binary Search.

UNIT- IV LISTS & TUPLES **10 Hour**

Lists: List Operations - List Slices - List Methods - List Loop – Mutability – Aliasing - Cloning Lists - List Parameters; **Tuples:** Tuple Assignment - Tuple as Return Value; **Dictionaries:** Operations and Methods; Advanced List Processing - List Comprehension; **Illustrative Programs:** Selection Sort - Insertion Sort - Merge Sort - Histogram.

UNIT- V FILES & EXCEPTION HANDLING **10 Hour**

Files and Exception: Text Files, Reading and Writing Files, Format Operator; Command Line Arguments, Errors and Exceptions, Handling Exceptions, Modules, Packages; **Illustrative Programs:** Word Count, Copy File.

Text Books

- Mark, Lutz. (2013). *Learning Python.* O'Reilly. (5th Ed.)
- Tony, Gaddis. (2018). *Starting Out With Python.* Pearson. (4th Ed.)

Reference Books

- Kenneth, A. Lambert. (2011). *Fundamentals of Python*.
- James, Payne. (2010). *Beginning Python using Python.2.6 and Python 3.1*. Wiley.

E-Resource

- http://www.sfu.ca/~eep2/Technology/Learning%20Python%205th%20Ed%202013.pdf

DATA STRUCTURES USING PYTHON PRACTICAL

UCSR207/UCAR205

Semester : II **Credit : 2**
Category : Major Core (DSC) - VI **Hour/Week: 3**
Class &Major : I BCA **Total Hour: 39**

Objectives:

To enable the Students

- Understand various Data Representation Techniques in the Real World.
- Implement Basic Concepts of Linear and Non-Linear Data Structures.
- Solve the Sorting and Searching Algorithms.

Learning Outcomes:

On Completion of the course, the students will be able to

- Understanding the Writing Algorithms in Solving Problems with the Help of Fundamental Data Structures.
- Analyze the Basic Concepts of Lists, Tuples, Trees and Graphs.
- Implement the Concepts of Searching and Sorting Techniques.

LIST OF PROGRAMS

1. Create a list of Elements where the Size of the List, Elements to be Inserted and Deleted are Dynamically given as Input.
2. Implement the Operations, Insertion, Deletion at a given Position in the List and Search for an Element in the list
3. Implement PUSH, POP Operations of Stack Operations.
4. Implement Add, Delete Operations of Queue.
5. Evaluate the Infix and Postfix Expression using Stack Operations
6. Implement the Graph Traversal Algorithms:
    a. Depth First Search.
    b. Breadth First Search
7. Binary Tree Traversal Using Linked List (In-order, Pre-order, Post-order).
8. Sorting Methods
    a. Bubble Sort
    b. Insertion Sort
    c. Quick Sort
9. Searching Methods
    a. Linear Search
    b. Binary Search
    c. Fibonacci Search
10. Create a Binary Search Tree and Count the Number of Nodes in the Binary Search Tree.

CYBER FORENSICS

UCAE208

Semester	**: II**	**Credit : 2**
Category	**: NME**	**Hour/Week : 3T**
Class & Major	**: I UG**	**Total Hour : 52**

Objectives:

To enable the Students

- Demonstrate Data Recovery from Hardware.
- Understand various Software Threats.
- Learn the Working of Surveillance Tools.

Learning Outcomes:

On Completion of the course, the students will be able to

- Define and Discuss the Concepts of Computer Forensics.
- Explain the Career of a Computer Forensics Professional.
- Explain and Apply the Concepts of Computer Investigations.

UNIT- I TYPES OF COMPUTER FORENSICS **10 Hour**

Computer Forensics Fundamentals – Types of Computer Forensics Technology – Types of Vendor and Computer Forensics Services.

UNIT- II DATA RECOVERY **12 Hour**

Data Recovery – Evidence Collection and Data Seizure – Duplication and Preservation of Digital Evidence – Computer Image Verification and Authentication.

UNIT - III ELECTRONIC EVIDENCE **10 Hour**

Discover of Electronic Evidence – Identification of Data – Reconstructing Past Events – Networks.

UNIT- IV THREATS **10 Hour**

Fighting against Macro Threats – Information Warfare Arsenal – Tactics of the Military – Tactics of Terrorist and Rogues – Tactics of Private Companies.

UNIT - V SURVEILLANCE **10 Hour**

The Future – Arsenal – Surveillance Tools – Victims and Refugees – Advanced Computer Forensics

Text Books

- Majid, Yar. (2013). *Cybercrime and Society.* Sage Publications.
- Chad, Steel. (2006). *Windows Forensics.* Wiley India.

Reference Book

- John R. Vacca(2005). *Computer Forensics.* Firewall Media.

PyMOL

UCAE209

Semester : II **Credit: 2**
Category : NME **Hour/Week: 3P**
Class & Major : I UG **Total Hour : 52**

Objectives:

To enable the Students

- Understand the Installation Steps of Pymol.
- Implement Simple Pymol Commands.
- Write Python Script to Interact Pymol.

Learning Outcomes:

On Completion of the course, the students will be able to

- Understand the Physical Movements of Atoms.
- Implement in 3D Visualization of Molecule.
- Learn to Apply the View of useful Drug Design Tools and their Functions in Pymol.

Lab Exercises

1. Install PyMOL
2. Load Protein from Public Structure Repository (Pdb Format) using Load and Fetch Commands.
3. Change the Color of a Protein Chain
4. Change the View of a Protein (Rotate And Move) using Rota and Move Commands.
5. Save an Image
6. Selecting Parts of an Object
7. Write Simple Python Script to Rotate a Molecule.
8. Write a Simple Python Code Interacts with Pymol to Show Animated Molecule.

QLIK VIEW

UCAE210

Semester : II **Credit : 2**
Category : NME **Hour/Week : 3P**
Class & Major : I UG **Total Hour : 52**

Objectives:

To enable the students

- Learn Business Intelligence Solution.
- Understand the Data Visualization Technique using Qlik View.
- Apply Qlik View function for Data Projection.

Learning Outcomes:

On Completion of the course, the students will be able to

- Appreciate How Key Fields are Identified and Form Associations between Tables.
- Understand How Visualizations are Created and Configured.
- Understand various ways to select Data within Qlik Sense.

Lab Exercises

1. Install Qlik View
2. Load Data from Different Sources in Qlik View

3. Apply Visualization Techniques
    a. Gauge Chart
    b. Waterfall Chart
    c. Cyclic and Drill Groups
4. Apply Data Transformation
    a. Loading Cross Table
    b. Loading Inline Table
    c. Loading Data from Already Stored Data in Qlik View (Resident Load)
    d. Joins, Concatenation of Tables
    e. Use of Mapping Tables
5. Apply Aggregate Function
6. Apply Access Restriction (Section Access)

INTERNET LAB

UCAE211

Semester : II **Credit : 2**
Category : NME (SKILL ENHANCEMENT COURSE) **Hour/Week :3P**
Class &Major : I UG **Total Hour : 52**

Objectives

To enable the Students

- Analyze a Webpage and Identify its Elements and Attributes.
- Create Webpage's using HTML and Cascading Style Sheets.
- Build Dynamic Webpage using Javascript.

Learning Outcomes

On Completion of the course, the students will be able to

- Implement Interactive Web Page(s) using HTML and Javascript.
- Design a Responsive Web Site using HTML and CSS
- Demonstrate Rich Internet Application.

List of Programs

1. Get to know your way around your Web Browser.
2. Understanding Web Browser and Searching the Web.
3. E-Mail Inner Working (Sending and Receiving).
4. Introduction to Chat Rooms, How to Connect and Chat.
5. Create a Simple HTML Page by using some of the Basic Tags.
6. To Create Time-Table using Table Tag.
7. Creation of Frames in Browser Window using HTML.
8. Working with Java Script and Creation of Dialogue Boxes using Alert.

9. Program to Perform four Arithmetic Operations viz. Addition, Subtraction, Multiplication and Division on Two Numbers using Java Script.
10. To Create a Web Site of our College.

DATA ANALYTICS TOOLS

UCAE212

Semester : II **Credit : 2**
Category : NME (SKILL ENHANCEMENT COURSE) **Hour/Week : 3P**
Class & Major: I UG **Total Hour : 52**

Objectives

To enable the Students

- Perform Basic Operations and Formatting and use Different Formulae and Functions.
- Summarize and Visualize Result of Data Analysis.
- Apply the above Skills to Analyze Various Kinds of Data.

Learning Outcomes

On Completion of the course, the students will be able to

- Understand How to Align Data in Cell Locations.
- Examine How to Enter Multiple Lines of Text in a Cell Location.
- Examine How to use the Feature of Data Analysis.

List of Programs

1. Creating Data in MS-Excel and do Addition, Subtraction, Multiplication and Division.
2. To Calculate Descriptive Statistics in Excel using the Data Analysis Tools.
3. To Generate Comparative Statistics in Excel using the Data Analysis Tools.
4. How to Run a Linear Regression Analysis in Excel using the Data Analysis Tools.
5. Exploring Data using Pivottable.
6. Creating a Power View Report.
7. Preparing Data for Consolidation.
8. Importing Data from Microsoft Access Database.
9. Importing Data from a Web Page.
10. Exploring Data with Creating Combination Charts.

E-Resources

- https://www.tutorialspoint.com/excel_data_analysis/excel_data_analysis_tutorial.pdf
- https://www.csusm.edu/qc/facultydocuments/biofolder/bio353.pdf

III & IV EVALUATION COMPONENTS OF CIA

Semester	Part	Category	Course Code	Course Title	Component III	Component IV
I	III	Major Core (DSC) - I	UCAM110	Principles of Information Technology	Assignment	Assignment
	III	Major Core (DSC) - II	UCAM111	Programming Methodology	Assignment	Problem Solving
	III	Major Core (DSC) - III	UCSR106	Programming Methodology - Practical	DPA	Viva-voce
II	III	Major Core (DSC) - IV	UCAM206	Data Structures	Assignment	Problem Solving
	III	Major Core (DSC) - V	UCAM207	Python Programming	Assignment	Problem Solving
	III	Major Core (DSC) - VI	UCAR205	Data Structures using Python - Practical	DPA	Viva-voce

NON-MAJOR ELECTIVES

Semester	Part	Category	Course Code	Course Title	Component III	Component IV
II	IV	Non Major Elective	UCAE207	Data Science using R	DPA	Viva-Voce
			UCAE208	Cyber Forensics	Assignment	Case Study
			UCAE209	PyMOL	DPA	Viva-Voce
			UCAE210	Qlik View	DPA	Viva-Voce
			UCSE211	Internet Lab	DPA	Viva-voce
			UCAE212	Data Analytics Tools	DPA	Viva-voce

DEPARTMENT OF PSYCHOLOGY

PREAMBLE

UG: Programme Profile and the Syllabi of Courses Offered in the I and II Semesters along with Evaluation Components III & IV (**With effect from 2021 - 2024 Batch Onwards)**.

PROGRAMME PROFILE B.Sc. Psychology

Programme Specific Outcomes (PSO)
Upon Completion of the Programme, the Students will be able to:

- Understand the Concept of Theories and Principles in Psychology.
- Use Laboratory Skills in Psychology.
- Apply the Applications of Psychology in different Fields.
- Analyze the Human Behaviour in Scientific Manner.

Semester	Part	Category	Course code	Course Title	Previous Course Code	Contact Hrs/ week	Credit Min/ Max
I	I	Languages / AECC - II Tamil / Hindi / French	UTAL107/ UTAL108/ UHIL102/ UFRL102	Basic Tamil- I/ Advanced Tamil- I/ Hindi -I / French- I	UTAL105/ UTAL106/ UHIL101/ UFRL 101	5	3/4
	II	Communicative English / AECC – 1	UENL109/ UENL110	English for Communication (Stream – I)/English for Communication (Stream – II)	---	5	3/4
	III	Major Core I / DSC	UPSM101	General Psychology- I	---	6	5
		Major Core II / DAC	UPSM102	Developmental Psychology- I	---	6	5
		Allied – I / (GE)	UPSA101	Human Physiology	---	6	4
		PE	UPEM101	Professional English	---	6	4
	IV	Value Education			---	2	1
TOTAL						**36**	**25/27**
II	I	Languages / AECC - II Tamil / Hindi / French	UTAL207/ UTAL208/ UHIL202/ UFRL202	Basic Tamil II/ Advanced Tamil II/ Hindi II/ French II	UTAL 205/ UTAL 206/ UHIL 201/ UFRL 201	5	3/4
	II	Communicative / English / AECC-1	UENL209/ UENL210	English for Communication (Stream – I)/English for Communication (Stream – II)	---	5	3/4
	III	Major Core III / DSC	UPSM201	General Psychology-II	---	6	5
		Major Core IV / DSC	UPSM202	Developmental Psychology- II	---	5	5
		Allied – II / (GE)	UPSA201	Elementary Statistics	---	6	4
		PE	UPEM201	Professional English II		6	4
	IV	Non-Major Elective			---	3	2
	V	Extension activity/ Physical Education/NCC			---	-	1/2
TOTAL						**36**	**27/30**

Semester	Part	Category	Course code	Course Title	Previous Course Code	Contact Hrs/ week	Credit Min/ Max
III	I	Languages / AECC – II Tamil / Hindi / French	UTAL307/ UTAL308/ UHIL302/ UFRL302	Basic Tamil I / Advanced Tamil I / Hindi I / French I	UTAL 305/ UTAL 306/ UHIL 302/ UFRL 301	5	3/4
	II	Communicative English / AECC – 1	UENL309/ UENL310	English for Communication (Stream – I)/English for Communication (Stream – II)		5	3/4
	III	Major Core V / DSC	UPSM303	Social Psychology – I	UPSM 103	6	5
		Major Core VI / DSC	UPSR302	Experimental Psychology-I		6	5
		Allied-III / (GE)	UPSA301	Principles of Management		6	4
	IV	Online Course		NPTEL/ Spoken Tutorial		3	1/2
		Value Education				2	1
				TOTAL		**36**	**22/25**
IV	I	Languages / AECC – II Tamil / Hindi / French	UTAL407/ UTAL408/ UHIL402/ UFRL402	Basic Tamil II Advanced Tamil II/ Hindi II / French II	UTAL 403/ UTAL 404	5	3/4
	II	Communicative English / AECC - I	UENL409/ UENL410	English for Communication (Stream – I)/English for Communication (Stream – II)	UENL 406	5	3/4
	III	Major Core VII / DSC	UPSM403	Social Psychology – II	UPSM 203	5	5
		Major Core VIII / DSC	UPSR402	Experimental Psychology-II		5	5
		Allied – IV / (GE)	UPSA401	Research Methodology	UPSM 402	5	4
	IV	Non-Major Elective				3	2
	IV	Soft Skill				2	1
	V	Extension activity/ Physical Education/NCC				-	-/2
				TOTAL		**30**	**23/27**
V	III	Major Core XI / DSC	UPSM501	Abnormal Psychology		6	5
		Major Core X / DSC	UPSM504	Organizational Psychology		6	5
		Major Core X / DSC	UPSM506	Theories of Personality	UPSM 303	6	5
		Major Elective / (DSE)	UPSO501	Consumer Behaviour	UPSM 505	5	4
			UPSO502	Human Resource Development	UPSM 603		
		Major Core XII / DSC	UPSP501	Project	UPSP 601	5	5
	IV	Value Education				2	1
				TOTAL		**30**	**25**
VI	III	Major Core XIII / DSC	UPSM601	Clinical Psychology		6	5
		Major Core XIV / DSC	UPSM602	Counselling Psychology		5	4
		Major Core XV /DSC	UPSM604	Health Psychology		6	5
		Major Core XVI	UPSM605	Positive Psychology	UPSM 503	6	6
		Major Elective / (DSE)	UPSO601	Psychological Testing & Case Conceptualization		5	4
			UPSO602	Rehabilitation Psychology			
	IV	Viva Voce	UPSM606	Comprehensive Viva Voce			1
	V	Soft Skill				2	1
	VI	Extension activity/ Physical Education/NCC				-	-/2
				TOTAL		**30**	**26/28**
				GRAND TOTAL		**192**	**148/162**

EXTRA CREDIT EARNING PROVISION

Semester	Part	Category	Course Code	Course Title	Contact/ Week	Credit	
						Min	Max
II	III	Summer Internship	UPSI201	Summer Internship	-	-	1
IV	III	Summer Internship	UPSI401	Summer Internship	-	-	1

COURSES OFFERED TO OTHER DEPARTMENTS
NON – MAJOR ELECTIVE

Semester	Part	Category	Course Code	Course Title	Contact Hour/Week	Credit Min/Max
II	IV	Non-Major Elective / SEC	UPSE201	Psychology for Effective Living	3	2
IV	IV	Non-Major Elective / SEC	UPSE401	Guidance and Counselling	3	2

GENERAL PSYCHOLOGY I
UPSM101

Semester : I **Credit : 5**
Category : Major core **Hour/Week : 6**
Class & Major: I B.Sc. Psychology **Total Hour : 8**

Objectives:
To enable the students

- Understand the basic concepts in Psychology.
- Differentiate various methods used in Psychology.
- Determine the causes of Behaviour.

Learning outcomes
On completion of the course the student will be able to

- Understand the Theoretical framework of Psychology.
- Analyse various Psychological processes like Sensations, Perceptions, Emotions, Learning, Intelligence, Personality, etc.
- Acquire the basic concepts and Applications of Psychology in everyday Life.

UNIT-I INTRODUCTION **16 Hour**

Definition - Psychology as a Science - Perspectives in Psychology: Psychodynamic, Behavioural, Humanistic, Bio-psychological, Evolutionary, Socio-Cultural, Cognitive. Behaviour - Genetics and Behaviour - Socio-Cultural Bases of Behaviour (Environment): Environment and Behaviour.

UNIT-II METHODS OF ASSESSMENT IN PSYCHOLOGY **16 Hour**

Goals of Psychological Enquiry - Introspective Method - Observation Method - Experimental Method - Correlation Method - Case Study Method - Clinical Method - Genetic Method - Interview Method - Survey Method - Rating Scales – Checklists – Questionnaires - Psychological Tests - Cross-Cultural Method.

UNIT-III SENSATION **16 Hour**

Sensation – Sensory Thresholds – Psychophysical Procedures – Sensory Adaptation – Vision: Basic Functions of the Visual System – Vision and the Brain- Hearing – Touch and other Skin Senses – Smell and Taste – Kinaesthesia and Vestibular Sense.

UNIT- IV ATTENTION **15 Hour**

Attention: Definition – Characteristics – Types - Determinants of Attention.

UNIT - V PERCEPTION **15 Hour**

Perception: Principles of Perceptual Organization - Constancies in Perception - Size, Shape, Form, Space, Movement - Depth Perception – Illusions - Plasticity of Perception.

Text Books

- Baron, R.A. (2018). *Psychology*. Pearson India Education Services. (5th Ed). Noida.
- Lahey, B. B. (1998). *Psychology: An Introduction*. Tata McGraw Hill. New Delhi.

Reference Books

- Feldman, R.S. (2002). *Understanding Psychology*. Tata McGraw Hill. New Delhi.
- Bootzin, R.R. Bower, G.H. Crocker, J. and Hall, E. (2005). *Psychology Today*. McGraw Hill. London.

E-Resources

- psylearners.psychotechservices.com
- www.pdffiller.com
- reading.realhappinesscenter.com

DEVELOPMENTAL PSYCHOLOGY I

UPSM102

Semester : I **Credit : 5**
Category : Major Core **Hour / Week : 6**
Class & Major: I B.Sc. Psychology **Total Hour :78**

Objectives

To enable the students

- Understand the Human Developmental stages and Processes along with Theories.
- Apply the Methods used in the Study of Child Development**.**
- Describe the Stages of Physical, Cognitive and Social Development in Infancy and Childhood.

Learning Outcomes

On completion of the course, the student will be able to

- Understand the Stages in Prenatal Development.
- Demonstrate the Key Concepts, Theories, and Research Methods in Lifespan Developmental Psychology.
- Describe the links between Developmental Processes in Childhood and later Life and Development in Socio-Cultural Context.

UNIT- I INTRODUCTION **16 Hour**

Human Development- Early Approaches to the Study of Human Development, - Ontogeny – Phylogeny - Developmental Processes and Periods - Biological - Cognitive and Socio-Emotional Processes - Influences on Development: Heredity - Environment and Maturation - Major Contextual Influences - Basic Theoretical Issues - Some Characteristics Influenced by Heredity and Environment.

UNIT- II PERSPECTIVES AND METHODS OF STUDIES ON CHILD DEVELOPMENT **16 Hour**

Perspectives - Psychoanalytic – Learning - Cognitive - Evolutionary / Socio-Biological - Ethological. Methods - Observational Studies – Interview - Experimental Studies - Correlation Studies - Developmental Studies - Cross-Sectional Studies - Longitudinal Studies - Sequential Studies - Micro-genetic Studies - Ethnographic Studies - Psycho-Physiological Studies - Standardized Tests.

UNIT- III PRENATAL PERIOD **16 Hour**

Conceiving New Life: Fertilization - Multiple Births - Mechanisms of Heredity - Genetic code - Determiners of Sex - Patterns of Genetic Transmission - Genetic and Chromosomal Abnormalities -Stages of Prenatal Development - Environmental Influences- Maternal Factors and Fraternal Factors - Parental Care.

UNIT- IV INFANCY AND TODDLERHOOD **15 Hour**

The Birth Process - The New Born Baby- Survival and Health- Early Physical Development - Studying Cognitive Development - Language Development - Foundations of Psychosocial Development - Developmental Issues in Infancy - Developmental Issues in Toddlerhood.

UNIT- V EARLY CHILDHOOD **15 Hour**

Physical Development: Aspects of Physical Development- Health and Safety - Cognitive Development- Piagetian Approach- Language and Other Cognitive Abilities- Early Childhood Education -Psychosocial Development: Developing Self- Gender- Business of Early Childhood, Parenting in Families in Trouble -Relationship with Other Children - Emotional development.

Text Books

- Papalia, D. E. & Feldman, R. D. (2004). *Human Development.* McGraw Hill. (9th Ed). New Delhi.
- Hurlock, E.B. (1996). *Developmental Psychology-A Life span Approach*. Tata McGraw Hill. New Delhi.

Reference Books

- Santrock, J. W. (2007). *Child Development*. Tata McGraw Hill. (11th Ed). New Delhi.
- Travers, D. (1999). *Human Development. Across the Life Span*. McGraw Hill. (4th Ed). London.

E-Resources

- www.betterworldbooks.com
- eresources.nlb.gov.
- www.clivar.org

HUMAN PHYSIOLOGY

UPSA101

Semester : I **Credit : 4**
Category : Allied **Hour / Week: 6**
Class & Major: I B.Sc. Psychology **Total Hour :78**

Objectives:

To enable the students

- Understand the Biological basis of Behaviour.
- Gain Knowledge on Physiology of the Nervous system, Sensory Process and Muscles.
- Understand the Physiology of Learning, Memory, Motivation, and Emotion.

Learning Outcomes

On completion of the course, the student will be able to

- Understand the Human Consciousness and Nature of Physiological Psychology.
- Describe Neural Communications.
- Discuss the Physiology behind Sensations.

UNIT-1 INTRODUCTION TO PHYSIOLOGICAL PSYCHOLOGY **16 Hour**

Definition of Physiological Psychology – Understanding Human Consciousness – The Nature of Behavioural Neuroscience - Biological Roots of Behavioural Neuroscience – Careers in Neuroscience.

UNIT-II STRUCTURE AND FUNCTIONS OF CELLS IN NERVOUS SYSTEM **16 Hour**

Cells of the Nervous System – Neurons – Supporting Cells - Communication within a Neuron - The Membrane Potential – Action Potential – Communication between Neurons - Structure of Synapse – Release of Neurotransmitter – Activation of Receptors.

UNIT-III STRUCTURE OF THE NERVOUS SYSTEM **16 Hour**

Basic Features of the Nervous System – The Central Nervous System: The Forebrain – The Midbrain – The Hindbrain – The Spinal Cord – The Peripheral Nervous System: Spinal Nerves – Cranial Nerves – The Autonomic Nervous System.

UNIT-IV VISION **15 Hour**

Anatomy of the Visual System – Coding of Visual Information in the Retina – Analysis of Visual Information – Role of the Striate Cortex – Role of the Visual Association Cortex.

UNIT-V AUDITION, THE BODY SENSES, AND THE CHEMICAL SENSES **15 Hour**

Audition – Vestibular System – Anatomy of the Skin and its Receptive Organs – The Somatosensory Pathways – Perception of Pain – Gustation – Olfaction.

Text Book

- Carlson, N.R. (2012). *Physiology of Behaviour*. Allen and Bacon. (11th Ed.). London.

Reference Book

- Carlson, N.R. (2009). *Foundations of Physiological Psychology*. Pearson Education. (6th Ed.) New Delhi.

E-Resources

- www.medicalnewstoday.com
- www.lavc.edu.com
- courses.lumenlearning.com

GENERAL PSYCHOLOGY II

UPSM201

Semester : II **Credit : 5**
Category : Major core **Hour / Week: 6**
Class & Major: I B.Sc. Psychology **Total Hour : 78**

Objectives

To enable the students

- Understand various Theories in Psychology.
- Explain the various Concepts in Psychology.
- Classify the Different Concepts and Causes of Behaviour.

Learning Outcomes

On completion of the course, the student will be able to

- Describe the Processes of Sensation and Perceptions.
- Elaborate the Concepts, Theories, Research, Physiological & Psychological Processes behind Human Motivation and Emotion.
- Explain how Psychological Needs and Cognitive Processes affect Motivation.
- Compare and Contrast Motivation and Emotion.

UNIT- I STATES OF CONSCIOUSNESS **16 Hour**

Nature of Consciousness - Natural States of Consciousness - Normal Waking Consciousness - Directed Consciousness - Flowing Consciousness - Divided Consciousness - Fantasy and Daydreaming (1) Sleep: Stages of Sleep - REM and non-REM Sleep (2) Dreams:

Functions and Meaning of Dreaming, Circadian Rhythms - Altered states of consciousness - Characteristics of Altered States Consciousness, (1) Altering Consciousness with Drugs.

UNIT-II LEARNING AND MEMORY **16 Hour**

Definition - Nature - Theories: Classical Conditioning - Operant Conditioning - Other Forms of Learning: Instrumental Learning - Cognitive Learning - Observational Learning - Skill Learning- Transfer of Learning.

Memory: Human Memory - Model of Memory - Sensory Memory - Short - Term Memory - Long- Term Memory – Kinds of Information Stored in Memory – Memory for Factual Information. Nature and Theories of Forgetting.

UNIT -III THINKING **16 Hour**

Basic Elements of Thought: Concepts - Prepositions - Images. Concepts: Types of Concepts - Concept Formation – Reasoning - Decision Making - Problem Solving - Creativity. Artificial Intelligence. Language and Development.

UNIT -IV INTELLIGENCE **15 Hour**

Thought Intelligence – Theories of Intelligence- Measurement of Intelligence – Human Intelligence - Group Differences in Intelligence- Emotional Intelligence.

UNIT –V MOTIVATION AND EMOTION **15 Hour**

Motivation: Theories of Motivation – Hunger – Sexual Motivation – Aggressive Motivation- Achievement Motivation – Intrinsic Motivation.

Emotions: Nature of Emotion – Biological basis of Emotion – External Expression of Emotion – Emotion and Cognition – Subjective Well-being.

Text Books

- Baron, R.A. (2018). *Psychology*. Pearson India Education Services. (5th Ed). Noida.
- Lahey, B.B. (1998). *Psychology: An Introduction*. Tata McGraw Hill. New Delhi.

Reference Books

- Feldman, R.S. (2002). *Understanding Psychology*. Tata McGraw Hill. New Delhi.
- Bootzin, R.R. Bower, G.H. Crocker, J. and Hall, E. (2005). *Psychology Today*. McGraw Hill. London.

E-Resources

- www.thebookee.net
- www.academia.edu
- www.open.umn.edu

DEVELOPMENTAL PSYCHOLOGY II

UPSA202

Semester : II **Credit : 5**
Category : Major core **Hour / Week : 5**
Class & Major: I B.Sc. Psychology **Total Hour :65**

Objectives

To enable the students

- Understand the Human Developmental stages and Processes along with Theories.
- Discuss the Influence of Domains in Development from Conception to Late Adulthood.
- Describe Development during Toddlerhood & Childhood.

Learning Outcomes

On completion of the course, the student will be able to

- Understand the Nature of Psychosocial Development.
- Comprehend the Theories and Research in Human Development.
- Describe the Developmental Stages during Birth to Late Adulthood.

UNIT- I MIDDLE CHILDHOOD **14 Hour**

Physical Development: Aspects of Physical Development – Health and Safety – Psycho Social Development: The Developing Self – The Child in the Family – The Child in the Peer Group – Mental Health- Developmental Disorders: Behavioural Problems During Childhood – Learning Disabilities – Dyslexia – Mental Retardation – Autism and Attention Deficit Disorder.

UNIT- II ADOLESCENCE **14 Hour**

Physical and Cognitive Development – Defining Adolescence – Theories of Adolescence -Physical Development – Cognitive Development – Psychosocial Development – Peer Relations – Sexual Behaviour – Sexually Transmitted Infections -Teenage Parent – Illegal Behaviour.

UNIT- III EARLY ADULTHOOD **13 Hour**

Physical and Cognitive Development: Initiation into Adulthood – Physical Development – Cognitive Development – Patterns of Work – Psycho-Social Development – Marriage and the Family – Personal Development – Sexual Identity and Gender Roles – Sexuality – Nature of Love.

UNIT-IV MIDDLE ADULTHOOD AND LATE ADULTHOOD **12 Hour**

Middle Adulthood- Physical and Cognitive Development- Physical Development - Cognitive Development -Patterns of Work - Psycho-Social Development- Dealing with Stresses of Adulthood - Marriage and Family Relations - Sex and Love in Middle Adulthood - Personality Development.

Late Adulthood: Physical and Cognitive Development - Aging- Physical Development - Cognitive Development. Psycho-Social Development - Social Development – Personal Development.

UNIT-V OLD AGE **12 Hour**

Personal - Social and family adjustments - Violence and health problems - Government policy for protection of safety of older people - The Role of spirituality in later life.

Text Books

- Papalia, D.E. Olds, S.W. & Feldman, R.D. (2004). *Human Developmen*t. McGraw Hill. (9th Ed). New Delhi.

Reference Books

- Santrock, J.W. (2007). *Child Development*. Tata McGraw Hill. (11th Ed). New Delhi.
- Travers, D. (1999). *Human Development: Across the Life Span*. McGraw Hill. (4th Ed). London.

E-Resources

- www.mheducation.com
- www.dept.clcillinois.edu
- www.canyons.edu

ELEMENTARY STATISTICS

UPSA201

Semester : II **Credit : 4**
Category : Allied **Hour / Week : 6**
Class & Major: I B.Sc. Psychology **Total Hour :78**

Objectives

To enable the students

- Understand various Statistical Techniques in terms of their Assumptions, Application, and Limitations.
- Acquire Competencies to Organize Data for Manual and Computer Analysis.
- Apply Elementary Competencies in Using Computer Packages of Statistical Analyses.

Learning Outcomes

On completion of the course, the student will be able to

- Define the Basic Concepts in Inferential and Descriptive Statistics.
- Apply the Concepts and Procedures of Descriptive Statistics.
- Describe the Principles of Probability and Hypothesis Testing.
- Interpret Common Inferential Statistical Tests and Correlation Methods.

UNIT-I INTRODUCTION **16 Hour**

Meaning and Definition of Statistics - Nature and Scope of Statistics - Uses and Limitation of Statistics - Application of Statistics in Psychology - Meaning and Definition of Variable - Dependent Variable - Independent Variable - Descriptive Statistics - Inferential Statistics.

UNIT-II ORGANIZATION OF DATA **16 Hour**

Meaning of Enquiry - Planning and Designing of Enquiry - Primary Data and Secondary Data - Framing Schedule - Classification and Tabulation of Data - Frequency Distribution - Diagrammatic and Graphical Representation of Data.

UNIT-III MEASURES OF CENTRAL TENDENCY **16 Hour**

Meaning and Purpose of Measures of Central Tendency - Characteristics and Types of Measures - Uses of Mean, Median and Mode - Computation of Mean, Median and Mode - Meaning, Purpose and Uses of Percentile Ranks.

UNIT-IV TEST OF MEAN DIFFERENCES **15 Hour**

Measurements of Variability - Range Quartile Deviations - Mean Deviation - Standard Deviation.

UNIT-V TEST OF ASSOCIATION **15 Hour**

Meaning, Purpose and Assumption of Analysis of Variance - One-Way ANOVA - Chi Square - Meaning and Characteristics of Correlation - Types of Correlation - Pearson's Product Moment Correlation - Spearman's Rank Order Correlation.

Text Books

- Garrett, H.E. (2014). *Statistics in Psychology and Education*. (6th Ed.). Paragon International Publishers. New Delhi.
- Mangal, S.K. (2014). *Statistics in Psychology and Educatio*n. (2nd Ed.). New Delhi.

Reference Books

- Arthur, A. and Elliot J.C. (2013). *Psychological Statistics.* Pearson Publication. (6th Ed.). New Delhi.
- Sasikala, M. and Girija, M. (2004). *Introduction to Statistics.* Vrinda Publications. (1st Ed.). New Delhi.

E-Resources

- nptel.ac.in
- www.statisticshowto.com
- cnx.org

PSYCHOLOGY FOR EFFECTIVE LIVING

UPSE201

Semester : II **Credit : 2**
Category : Non Major Elective **Hour / Week: 3**
Class & Major: I B.Sc. Psychology **Total Hour : 60**

Objectives

To enable the students

- Gain Knowledge on Psychology for Effective Living.
- Acquire Lifestyle that Improves Psychology for Effective Living.
- Apply the Techniques to Overcome Stress in Day to Day Life.

Learning Outcomes

On completion of the course, the student will be able to

- Describe the Major Theories and Models of Psychological Adjustment to Modern Life.
- Analyse the Nature of Stress and its Effect on the Health of Individuals.
- Evaluate how People are Influenced by the Social World in which they Live.
- Discuss the Research on Friendships, Intimate Relationships, Family Relationships and Explain how they relate to Psychological Adjustment.

UNIT- I SEEKING SELFHOOD **12 Hour**

Self-Concept – Core Characteristics of Self-Concept – Self Consistency, Self-Esteem - Self Enhancement and Self Verification – Self Concept and Personal Growth. Exercise on Self Image and Ideal Self.

UNIT- II A HEALTHIER YOU **12 Hour**

Body Image – Psychological Factors and Physical Illness – Coping with Illness. At the end of the Unit the Students will be given Exercise on Rating Health Habits.

UNIT- III TAKING CHARGE OF YOUR LIFE **12 Hour**

Mastery and Personal Control – Resolve and Decision Making – Decisions and Personal Growth. Test to Measure "How Much Control You Think You Have?".

UNIT- IV YOUR FRIENDS AND YOU **12 Hour**

Meeting People – Impression, Interpersonal Attraction – Friendship, Self Disclosure, Loneliness. Test to Measure "How Shy are You?".

UNIT- V LOVE AND COMMITMENT **12 Hour**

Love and Intimacy – Commitment – Adjusting to Intimate Relationships – Divorce and its Consequences Exercise on "Marital Myths".

Text Books

- Duffy, G. K. Atwater, E. (2008). *Psychology for Living- Adjustment, Growth and Behaviour Toda*y. Pearson Education Inc. India.
- Wayne, W. Margret, A. (2004). *Psychology Applied to modern Life*. Thompson Wadsworth. (7th Ed). Singapore.

Reference Books

- Shelley, E. Taylor, (2006). *Health Psychology.* Tata McGraw Hill Education Private Limited. (6th Ed). New Delhi.
- Sunder, S. (2002). *Textbook of Rehabilitation*. Jaypee Brothers. (2nd Ed). New Delhi.

E-Resources

- www.pearson.com
- www.academia.edu

III & IV EVALUATION COMPONENTS OF CIA

Semester	Category	Course Code	Course Title	Component III	Component IV
I	Major Core I / DSC	UPSM101	General Psychology- I	Term Paper	Seminar
I	Major Core II / DSC	UPSM102	Developmental Psychology- I	Term Paper	Seminar
I	Allied – I / (GE)	UPSA101	Human Physiology	Term Paper	Seminar
II	Major Core III / DSC	UPSM201	General Psychology-II	Term Paper	Seminar
	Major Core III / DSC	UPSM202	Developmental Psychology-II	Term Paper	Seminar
II	Allied – II / (GE)	UPSA201	Elementary Statistics	Problem Solving	Seminar
II	Non-Major Elective / SEC	UPSE201	Psychology for Effective Living	Term Paper	Seminar

PART IV-VALUE EDUCATION

PREAMBLE:

The Course Profile and the Syllabi of Courses offered in Semesters I, III, V (with Effect from 2021-2024Batch onwards) are presented in this Booklet.

Semester	Part	Category	Course code	Course Title	Contact Hrs	Credit
I	IV	Value Education	UGEV101	Values in Life	2	1
			UGEV104	Globalization and Values in Family Life	2	1
			UGEV105	Family Life Education	2	1
III	IV	Value Education	UESV301	Pollution and Its Management	2	1
			UESV304	Biodiversity	2	1
			UESV305	Environmental Issues And Human Health	2	1
			UESV306	Natural Resources and Conservation	2	1
			UESV307	Consumer Protection	2	1
			UESV308	Awareness On Anticorruption	2	1
			UESV309	Human Rights	2	1
			UESV310	Environmental Science	2	1
			UESV311	Fundamental Rights in Indian Constitution	2	1
V	IV	Value Education	UWSV501	Women and Education	2	1
			UWSV502	Women's Rights	2	1
			UWSV503	Domestic Violence Against Women	2	1
			UWSV504	Women and Health	2	1
			UWSV505	Cyber Security	2	1

VALUES IN LIFE
UGEV101

Semester : I **Credit :1**
Category : Value Education **Hour /Week :2**
Class & Major : I UG **Total Hour :26**

Objectives
To enable the students

- Understand the Need and Importance of Value Education and Education for Human Values.
- Understand the Intervention Strategies for Moral Education and Conversion of Moral Learning into Moral Education.
- Understand the Nature of Values, Moral Values, and Moral Education and Differentiate such Values from Religious Education, Moral Training or Moral in Doctrinarian.

Learning Outcomes:
On completion of the course the student will be able to

- Understand the Need and Importance of Value Education & Education for Human Values.
- Identify the Intervention Strategies for Moral Education and Conversion of Moral Learning into Moral Education.
- Understand Social, Cultural, Ethical and Family Values and Cherishing the Values by Practice.

UNIT -I INTRODUCTION **5 Hour**

Value Education– Definition – Relevance to present day – Concept of Human Values Self Introspection – Self Esteem.

UNIT - IISOCIAL VALUES **5 Hour**

Social values - Faith, Service and Secularism – Social sense and Commitment - Students and Politics –Social Awareness.

UNIT – IIICULTURALVALUES **5 Hour**

Cultural Values –Respect for Elders – Hospitality – Charity – Gentleness – Kindness – Peace –Love – Non Violence – Appreciation of other Culture.

UNIT – IVETHICALVALUES **5 Hour**

Ethical Values – Mass Media – Advertising Ethics – Professional Ethics – Influence of Ethics on Family Life – Psychology of Youth – Leadership Qualities – Personality Development.

UNIT - VFAMILY VALUES **6 Hour**

Family Values – Components, Structures and Responsibility of Family – Status of Women in Family and Society – The Analysis of Mind – Instinct and Habit – General Ideas and thoughts – Truths and Falsehood.

Reference Books

- Anchukandam, T. Kuttianimathathil, J. (1995). *Grow Free Live Free*. Kristtu Jyoti Publications. Bangalore.
- Daniel. Selvamony. (1990). *Value Education Today*. (Madras Charistian College. Tambaram & ALACHE). New Delhi.
- Mani Jacob. (2002). *Resource Book for Value Education.* Institute for Value Education, New Delhi.
- Scarf Peter. (2001). *Readings in Moral Education*. Minnipolis Press Inc.
- Wilson, J. Williams, N. Sugarman, B. (1967). *Introduction to Moral Education*. Penguin Books.

GLOBALIZATION AND VALUES IN FAMILYLIFE

UGEV104

Semester: I **Credit :1**
Category: Value Education **Hour/Week:2**
Class & Major: I UG **Total Hour :26**

Objectives:

To enable the students

- Inculcate a Sound System of values with correct Priorities.
- Acquire the Skill Necessary to Transform into Complete Human.
- Develop a Good Personality in the Growing Adolescent.
- Provide Good Moral, Spiritual Code & Stable Relationship.

Learning Outcomes:

On completion of the course the student will be able to

- Understand the Sound System of Values with Correct Priorities.
- Acquire the Skill Necessary to Transfer into Complete Human.
- Develop Goal Personality to Preserve the Mental Health, Hygiene and Overall Family Values.

UNIT -I INTRODUCTION **5 Hour**

Family Life: Definition of Family and Family Life - Types of Family Patterns - Indian Family - Social Functions of the Family - Family as a Custodian &Transmitter of Values - Reunite Families with their Origin.

UNIT–II RELATIONSHIPS & RESPONSIBILITY INAFAMILY **5 Hour**

Relationships & Responsibility in a Family:-Mothering - Fathering – Mother & Daughter Relationship - Warmth and Love Oriented Discipline - Adjustability in a Family - Caring for Needy Elders. Time Allotment and Sharing Ideas - Dutiful Parent Responsibility.

UNIT – III GLOBALIZATION AND ITS IMPACTSONFAMILY: **5 Hour**

Globalization and its Impacts on Family:-Mobility of Family - Joint Family - Nuclear Family – Divorce - Single Parent Family - Old Age Home – Crèche-Fission of Family Structure - Children affected by Urbanization and Nuclear Family.

UNIT – IV IMPACT OF GLOBALIZATION ON CULTURAL ACTIVITIES OF FAMILY **7 Hour**

Impact of Globalization on Cultural Activities of Family:-The Process of Socialization - Cultural Diffusion - Cross Culture in Food - Festival and Dress - Life Style of Adolescent - Infatuation – Peer Groups – Love - Mental Health - Mental Hygiene - Mental Health Programme-Anxiety – Stress – Eustress -Distress.

UNIT - V RESPONSIBILITIES TO PRESERVEFAMILYVALUES **4 Hour**

Responsibilities to Preserve Family Values: Teaching Children the Values of Responsibility -Mental Health and Hygiene - Healthy Management of Stress – Parent - Teacher Responsibility - Parent Responsibility towards Adolescent - Personality Development - Moral Education.

Reference Books

- Lakshminarayanan, K. R. & Umamageswari, M. *Value Education*. Nalnilam Publication. Chennai.
- Mascarenhas, M.M. *Natural Family Planning*. Bangalore.
- Marie Mignon Mascarenhas. Family Life Education - Value Education. MFCMRCP (Eng). DPH (Lond). FRIPHH (Engg).

FAMILY LIFE EDUCATION
UGEV105

Semester :I **Credit :1**
Category :Value Education **Hour/Week :2**
Class & Major : I UG **Total Hour :26**

Objectives:
To enable the students

- Understand the Values of Family Life.
- Acquire the Skills Necessary to Develop and Maintain stable relationship.

Learning Objectives:
On completion of the course the student will be able to

- Understand the Values of Family Life.
- Accept the Difference in Changing Roles of Women.
- Acquire the Skills Necessary to Develop and Maintain Stable Relationship.

UNIT – I THE FAMILY **2 Hour**

Definition of Family and Family Life – Need for Family - Importance of Family – Social Functions of Family – Types of Family – Changing trend(Positive and Negative approaches).

UNIT – II MARRIAGE **5 Hour**

Definition -Types of Marriage – Love, Arranged, Arranged Love Marriages. Love and Infatuation Marriage – Purpose of Marriage – Need for Marital Preparation and Premarital Counseling. Dating, Courtship, Choosing the Life Partner, Premarital Intimacy.

UNIT – II CONJUGAL HARMONY **5 Hour**

Husband and Wife Relationship: Difference between Men and Women. Accepting Difference, Mutual Understanding and Adjustment. Changing Roles of Husband and Wife – Multiple Role of Women in Present Day- Handling Conflicts in Marriage Life.

UNIT -IV REPRODUCTION **7 Hour**

Definition – Determinants of Sexuality, Sex Education – Female Reproductive System – Male Reproductive System – Pregnancy and Birth – Family Planning – Child Care.

UNIT –V PROTECTION **7 Hour**

Family Disorganization – Impact of Globalization on Family – Separation – Divorce, Deservation– Single Parent Family – Need to Protect our Self in Marriage – Pre Family Counseling Centers – Family Court – All Women's Police Station.

Reference Books

- Betty, Carten. Mcg, Goldric. (2000). *The Changing Family Life Cycle – A Framework for Family Therapy.* II Edition.
- Marie, Masearentas. (1999). *Family Life Education. CREST -Center for Research Education Service Training for Family Life Promotion*. Bangalore.

POLLUTION AND ITS MANAGEMENT

UESV301

Semester :III **Credit :1**
Category : Value Education **Hour/Week :2**
Class & Major : II UG **Total Hour :26**

Objectives:

To enable the students

- Become Pollution Conscious.
- Know How to Control the Pollution and Make them Analyze the Methods of Management of Waste in their Day to Day Life.

Learning Outcomes:

On completion of the course the student will be able to

- Understand the Need for Public Awareness and Methods to Propagate Environment Awareness.
- Become Pollution Conscious.
- Control Pollution and Make them Analyse the Methods of Management of Waste in their Day to Day Life.

UNIT–I INTRODUCTION TO ENVIRONMENTAL STUDIES 6 Hour

Definition- Scope- Importance and Need for Public Awareness and Methods to Propagate Environmental Awareness.

UNIT – II ENVIRONMENTAL POLLUTION 5 Hour

Causes- Deleterious Effects and Control Measures of Air Pollution- Water Pollution and Noise Pollution.

UNIT – III ENVIRONMENTAL POLLUTION 5 Hour

Causes- Deleterious Effects and Control Measures of Soil Pollution- Plastic Pollution Thermal and Nuclear Pollution- Role of an Individual in Prevention of Pollution.

UNIT – IV SOLID WASTE MANAGEMENT 5 Hour

Causes- Effects and Control Measures of Urban and Vermi Composting.

UNIT – V DISASTER MANAGEMENT 5 Hour

Floods- Earthquake- Cyclone and Landslides- Watershed Management and Rainwater Harvesting and Energy Conservation in Urban Areas.

References Books

- Kaushik & Kaushi. Perspectives in Environmental Studies. New Age International Publishers.
- Kalavathy, S. *Environmental Studies*. Bishop Heber College. Trichy.

BIODIVERSITY

UESV304

Semester :III **Credit :1**
Category :ValueEducation **Hour/Week :2**
Class&Major : II UG **Total Hour :26**

Objectives:

To enable the students

- Know about Environmental Impact in the Society.
- Create the Awareness of Environmental Effect & Remedial Measures.

Learning Outcomes:

On completion of the course the student will be able to

- Understand the Components of Biodiversity and the Importance of Biodiversity in Daily Life.
- Take Remedial Measures to Safe Guard the Biodiversity.

UNIT-I INTRODUCTION 5 Hour

Definition- Biodiversity – Components of biodiversity – Genetic Species and Ecosystem Diversity - Evaluation and Genesis of Biodiversity – Biodiversity Crisis &Loss – Importance of Biodiversity in Daily Life - Biodiversity and Climate Change.

UNIT-II BIODIVERSITY IN INDIA **5 Hour**

Levels of Biodiversity – Global, National &Local Levels - Biogeographical Classification of India- India as Mega Diversity Nation - "Hot-spots" and Biodiversity in India.

UNIT-III MODERN TOOLS IN THE STUDY OF BIODIVERSITY **5 Hour**

Endemism, Endemic Plants and Animals - Assessment of Mapping of Biodiversity- GIS/ Remote Sensing – IUCN - Germ Plasm Banks - National Parks - Botanical Gardens - Wild Life Sanctuaries.

UNIT-IV THREATS TO BIODIVERSITY **5 Hour**

Habitat Loss and Destruction - Poaching of Wildlife - Man-Wildlife Conflicts – Alterations in Ecosystem - Introduction of Exotic Species – Over Exploitation – Global Climate Change - Stages of Species in India.

UNIT-V VALUES AND CONSERVATION OF BIODIVERSITY **5 Hour**

Values – Consumptive- Productive Use Values - Social Value - Ethical and Moral Values - Aesthetic Value – Option Values. Conservation –In-situ and Ex-situ Conservation - Community Participation in Conversation - Conservation of Wetlands - Medicinal Plants - Indian and International Conservation Strategies, Green India Mission.

Reference Books

- Asthana, D.K. Meera, Asthana. (2005). *Envirnoment: Problems and Solutions*. S. Chand & Company. New Delhi.
- Benny Joseph. (2005). *Environmental Studies.* Tata McGraw – Hill, New Delhi.
- Sivakumar, M. Saravanan, R. June. (2006). Principles *of Environmental Science and Engineering*. Third Edition. Lakshmi Publications.
- Rajamannar. (2004). *Environmental Studies*. EVR College Publication. Trichy.
- Kalavathy, S. (ED.). (2004). *Environmental Studies*. Bishop Heber College Publication, Trichy.
- Ramesh Menon. June (2005). *Restoring in Endangered Biospecies*.

ENVIRONMENTAL ISSUES AND HUMAN HEALTH

UESV305

Semester :III **Credit : 1**
Category : Value Education **Hour/Week : 2**
Class & Major :II UG **Total Hour :26**

Objectives:

To enable the students

- Environment conscious.
- Understand the environmental issues and its impact on human health.
- Provide them with value based environmental education.

Learning Outcomes:

On completion of the course the student will be able to

- Understand the Need for Public Awareness and Methods to Propagate Environment Awareness.
- Identify the Environment Issues and its Impact on Human Health.
- Realize the role of Information Technology in Value Based Environmental Education.

UNIT – I INTRODUCTION TO ENVIRONMENTAL STUDIES **6 Hour**

Definition – Scope- Importance and Need for Public Awareness and Methods to Propagate Environmental Awareness.

UNIT – II SOCIAL ISSUES AND ENVIRONMENT **5 Hour**

Resettlement and Rehabilitation Issues- Environmental Ethics- Issues and Possible Solutions.

UNIT – III DISASTER AND ENVIRONMENT **5 Hour**

Global Warming- Acid Rain- Ozone Depletion- Wasteland Reclamation- Consumerism and Waste Products. Role of Women and NGO's in Environmental Protection.

UNIT – IV HUMAN POPULATION AND WELFARE PROGRAMME **5 Hour**

Population Explosion- Family Welfare Programme- Environment and Human Health- Value Based Environmental Education.

UNIT – V HUMAN HEALTH AND ENVIRONMENT **5 Hour**

Effect of HIV / AIDS on Environment- Women and Child Welfare- Role of Information Technology in Environment and Human Health.

Reference Books

- Kaushik. Kaushik. Perspectives in Environmental Studies. New Age International Publishers.
- Kalavathy, S. *Environmental Studies.* Bishop Heber College. Trichy.
- Kumaraswamy, K. Alagappa Moses, K. Vasanthy, M. *Environmental Studies*. Bharathidasan University Publications.
- Rajamannar. *Environmental Studies*. EVR College Publications.

NATURAL RESOURCES AND CONSERVATION

UESV306

Semester :III **Credit :1**
Category :Value Education **Hour/Week :2**
Class & Major :II UG **Total Hour :26**

Objectives:

To enable the students

- Know about the Types of Natural Resources.
- Become Natural Resources Conscious.

Learning Outcomes:

On completion of the course the student will be able to

- Understand the Concept of Renewable and Non-renewable Resources.
- Classify the Types of Natural Resources.
- Realize the Role of Individuals and NGO's in Sustainable Resource Utilization.

UNIT-I NATURAL RESOURCES **4 Hour**

Definition-Classification-Concept of Renewable and Non-Renewable Resources-Their Conservation and Importance.

UNIT- II ENERGY RESOURCES **6 Hour**

Non-Renewable and Conventional Energy Resources like Coal, Petroleum, Fuel Gases, - Renewable and Non-Conventional Energy Resources like Solar, Wind, Geothermal, Trial and Wave Energy, Bio Mass- Biogas and Bio Diesel- Environmental impacts of Energy Exploitation- Energy Conservation.

UNIT- III WATER RESOURCES **6 Hour**

Water Resources on the Earth- Consumption and Uses of Water- Management and Conservation of Water Resources- Rain Water Harvesting- Conflicts Over Sharing Water.

Forest Resources and Bio Diversity- Importance of Forests and Bio Diversity- Types of Forest Resources- Overexploitation of Forests- Deforestation- Forest Management and Conservation- Conservation of Bio-Diversity.

UNIT-IV SOIL RESOURCES AND MINERAL RESOURCES **6 Hour**

Importance – Classification of Soils – Soil Formation- Soil Profile-Soil Fertility-Major Types of Soils in India. Mineral Resources- Types and Importance of Minerals-Important Minerals of India- Mineral Extraction and Environmental Problems - Conservation of Mineral Resources- Reclamation of Mining Areas.

UNIT- V ROLE OF INDIVIDUALS AND NGOS IN RESOURCE CONSERVATION

4 Hour

Environmental Movements such as 'Chipko' Western ghat and Silent Valley-Narmada Project Agitation etc, - Role of Individuals and NGO's-Sustainable Resource Utilization.

Reference Books

- Benny Joseph. (2005). *Environmental Studies.* Tata Mc Gram Hill Publishing Company Limited. New Delhi.
- Cunningham W.P. Cooper. Gorhani, T.H.(2001). *Environmental Encyclopedia.* Jaico Publication House Mumbai.
- Gilbert M. Masters. (2004). *Introduction to Environmental Engineering Science.* Pearson Education Pvt. Ltd. (2nd Ed.).

CONSUMER PROTECTION
USEV307

Semester :III **Credit :1**
Category :Value Education **Hour/Week :2**
Class & Major: II UG **Total Hour :26**

Objectives:
To enable the students

- Gain awareness on Consumer Protection.
- Know about the Redressal Mechanism.
- Know about the Right and Responsibility of the Consumer.

Learning Outcomes:
On completion of the course the student will be able to

- Understand the Importance of Consumer and Objectives of Consumer Protection Act.
- Know the Rights and Responsibility of the Consumer.
- Realize the Consumer Redressal Mechanism in Practice.

UNIT -I INTRODUCTION **4 Hour**

Consumer – Meaning – Definition - Importance of a Consumer - Consumer Behavior.

UNIT - II CONSUMER PROTECTION COUNCIL **5 Hour**

Meaning of Consumer protection - Definition of the concept - Objectives of the Act-Consumer Protection Council.

UNIT -III ADULTERATION **5 Hour**

Adulteration - How to Face the Problems with the Marketers - How to Approach the Court.

UNIT - IV SALE OF GOODS ACT **5 Hour**

Sale of Goods - Formation of Contract - Conditions and Warranties - Rights of an Unpaid Seller.

UNIT - V CONSUMER REDRESSAL MECHANISM **7 Hour**

Redressal Mechanism - Consumer Disputes Redressal Forms - State and National Consumer Disputes Redressal Commission.

Reference Books

- Kapoor, N.D. (2005). *Elements of Mercantile Law*. Sultan Chand And Sons. New Delhi.
- Kapoor, N.D**. (**2006). *Business Laws*. Sultan Chand And Sons. New Delhi.
- Matinchan, C.B. (2004). *Consumer Behavior.* Margham Publications. Chennai.
- Philip Kotler. (2005). *Marketing Management*. Himalaya Publications. New Delhi.
- Rajan Nair. (2006). *Marketing Management*. Sultan Chand and Sons. New Delhi.

AWARENESS ON ANTICORRUPTION

USEV308

Semester: III **Credit : 1**
Category: Value Education **Hour/Week : 2**
Class & Major : II UG **Total Hour :26**

Objectives:

To enable the students

- Understand Evils of Corruption.
- Appreciate and Adopt Anti-Corruption Strategies.

Learning Outcomes:

On completion of the course the student will be able to

- Understand the Factors Responsible for Corruption.
- Realize the Evils of Corruptions.
- Appreciate and Adopt Anti-Corruption Strategies with the Help of Role of Law.

UNIT -I CORRUPTION **6 Hour**

Corruption: Definition-Etymology-Types: Governmental and Non-Governmental Services. Corruption in India: Major Factors Responsible for Corruption.

UNIT - II CORRUPTION& SCAMS **5 Hour**

Corruption Effects-Causes-Factors-Major Scams Identified in India: 2G Spectrum, Commonwealth Games, Telgi, Satyam, Bofors, Fodder, Hawala Scandal, IPL Scam, Stock Market Scams and others –Impact on Society.

UNIT -III ANTI-CORRUPTION **5 Hour**

Anticorruption: Definition-Types: Petty and Grand-Organized and Unorganized - Types of anti-corruption programs : Rule of Law - Fiscal/Customs, Civil Society Programs, Financial Management and Other Programs.

UNIT - IV CORRUPTION ANDANTI-CORRUPTIONSTRATEGIES **5 Hour**

Corruption and Anti-corruption Strategies: Introduction-Good Government and Governance, Corruption and Change, Issues in Dealing with Corruption, Choice of Strategy for Anti-Corruption- Measures to Control Corruption.

UNIT-V CORRUPTIONANDPUNISHMENT **5 Hour**

Corruption and Types of Punishment: Introduction – Offences: Personation, Postal Vote, Candidate, Bribing, Treating- Non Criminal sanctions-Criminal Punishment.

Reference Books

- Seumas Miller. Peter Robert. Edward Spence. (1999). *Corruption and Anti-Corruption: An Applied Philosophical Approach*. First Edition. Frank Cross Publishers.
- Goran Klemen. Janez Stusek. (2000). *Specialised Anti-Corruption Institutions: Review of Models*. University of California Press. (1st Ed.).
- Susan Rose-Ackerman. (1999). *Corruption and Government – Causes, Consequences and Reform*. Published by the University of Cambridge. (1st Ed.).
- Kimberly Ann Elliot. (1997). *Corruption and Global Economy*. Published by Institute for International Economics.
- Seppo Tiihonen. (2003). *The History of Corruption in Central Government*. Published by IOS Press. (1st Ed.).
- Mark Robinson. (1998). *Corruption and Development*. First Edition. Frank Cass Publishers.
- Robert Klitgaard. (1998). *Controlling Corruption*. University of California Press. (1st Ed.).

HUMAN RIGHTS

USEV309

Semester : III **Credit : 1**
Category : Value Education **Hour/Week : 2**
Class& Major : II UG **Total Hour : 26**

Objectives:

To enable the students

- Develop Awareness on how Human Right can be Translated into Social and Political Reality.
- Gain Knowledge about Constitutional Law.

Learning Outcomes:

On completion of the course the student will be able to

- Develop Awareness on Rights of Children, Women, Bonded Labour and Wages.
- Gain Knowledge about Constitutional Law.
- Realize the Directive Principle of State Policy and National Human Rights Commission.

UNIT –I INTRODUCTION **4 Hour**

Definition of Human Rights – Nature – Scopes - Significance of HR- Historical Development of HR.

UNIT –II HR LAWS **6 Hour**

Universal Declaration of International Covenant of HR-1948-The Protection of HR Lights Act 1993-Political Rights 1996- ICESR- International Covenant on Economical Social & Cultural Rights1996- Natural HR Commission.

UNIT –III CONTEMPORARY ISSUES **5 Hour**

Contemporary Issues on Human Rights- Children right – Women's Right- Bonded Labor &Wages.

UNIT – IV CONSTITUTIONAL LAW **6 Hour**

Constitutional Law Vs Human Rights- Fundamental Rights- Globalization & Human Rights- The Right to Information Act2005 – Human Rights Perspective of Social Research.

UNIT – V NATIONAL HUMAN RIGHTS COMMISSION **5 Hour**

Fundamental Rights in Indian Constitution – Directive Principles of State Policy- Fundamental Duties – National Human Rights Commission.

Reference Books

- International Bill of Human Rights. (1988). Amnesty International Publication.
- Human Rights. (1982). Questions and answer. UNESCO.
- Mausice Cranston. What are Human Rights.

WOMEN AND EDUCATION
UWSV501

Semester	**:V**	**Credit**	**: 1**
Category	**: Value Education**	**Hour/Week**	**: 2**
Class& Major	**: III UG**	**Total Hour**	**: 26**

Objectives:
To enable the students

- Understand about the Need of Women's Education.
- Empower Themselves through Education.

Learning Outcomes:
On completion of the course the student will be able to

- Understand the concept of Women's Empowerment.
- Maintain Work-Life Balance.
- Reorganize the Education System for Raising the Status of Women.

UNIT-I INTRODUCTION **2 Hour**

Concept of Women Empowerment – Women's Empowerment in Today's World - Global Gender Gaps – Women's Rights - Women's Movements.

UNIT- II STATUS OF WOMEN **5 Hour**

IdeologicalandSocialCulturalConstruction-SexRatio– FamilyPlanningandWelfareEducation -Health and Gender Bias – Work related Issues-Existing Prejudices-Gender Discrimination- Political Participation: Lack of Women's Representation.

UNIT- III SEXISM IN EDUCATION **5 Hour**

Sexism in Education – Education is an Agent to Change the Sex Role Stero typing – Gender Inequality in Education.

UNIT- IV EDUCATION OF WOMENINDEVELOPMENT **7 Hour**

Approaches to Women's Education – Reorganizing and using the Education System for Raising the status of Women - Eradication of Literacy-Education for Achieving Quality of Life Equality Opportunity and Equity Creating Gender Sensitive Educational System.

UNIT-V ROLE OF WOMENIN DEVELOPMENT **7 Hour**

Women in Developing Countries with Special Reference to India - Famous Women Personalities in Different Sectors - Women in National Development- Leadership Qualities - Women in Decision Making.

References Books

- Agarwal, S.P. (2001). *Women's Education In India*. Guwahati. Eastern Book House.
- Gupta, N.L. (2001). *Women Education Through Ages*. Guwahati Eastern Book House.
- Narasimha Sakuntala. (1999). *Empowering Women.* New Delhi. Sage Publications.
- Singh, N.K. (1999). *Women Education*. New Delhi. Sage Publications.

WOMEN'S RIGHTS
UWSV502

Semester :V **Credit : 1**
Category : Value Education **Hour/Week : 2**
Class & Major :III UG **Total Hour :26**

Objectives
To enable the students

- Understand about the Violence against Women.
- Gain Knowledge about the Women's Rights.

Learning Outcomes:
On completion of the course the student will be able to

- Understand the various Violence against Women.
- Gain Knowledge about the various Acts for the Cause of Women.
- Realize the Role of Women's Organization, Global Level Support for Women's Right and the Impact of CEDAW in India.

UNIT – I INTRODCUTION **3 Hour**

Human Rights – Definition and Meaning – Introduction to Women Rights, Nature and Characteristics – Importance.

UNIT - II NEED FORWOMEN'S RIGHTS **6 Hour**

Violence against Women-Various Forms of Violence- Verbal Violence-Physical Violence Eve Teasing-Sexual Adherence-Child Abuse-Mental Torture.

UNIT-III FAMILY AND WOMEN'S RIGHTS **7 Hour**

Rights to Education-Child Marriage Act – Domestic Violence Act- Family Court Act-Dowry Prohibition Act - Maintenance, Marriage, Divorce, Adaptation- Minority and Guardian Ship- Rights to Property.

UNIT- IV CAREER WOMEN AND RIGHT **4 Hour**

Sanitation at Work Place - Sexual Harassment at Workplace-Maternity Benefit Act - Equal Benefits – Reservation Policy.

UNIT-V POLICIES AND PROGRAMMES **6 Hour**

Government Policies and Programmes - Action for Ensuring Rights of Women - The National Commission for Women - Role of Women's Organization – Global Level Support for Women's Right-The Impact of CEDAW in India.

Reference books

- Das, P.K. (2007). *Universal Handbook on Protection of Women from Domestic Violence Act and Rules*. Universal Law Publishing Co. Pvt Ltd.
- Marjorie Agosin ed. (2005). *Women Gender and Human Rights. Global Perspective*. Rawal- Publication New Delhi.
- Mohini Chatterjee. (2004). *Feminism and Women's Human Rights-Vol.2*.Aavishkar Publication, Jaipur .
- *www.pucl.org\topics\gender\2003-pucl Bulletin*, July 2003. Aug 2004.

DOMESTIC VIOLENCE AGAINST WOMEN
UWSV503

Semester :V **Credit : 1**
Category : Value Education **Hour/Week : 2**
Class & Major :III UG **Total Hour :26**

Objectives
To enable the students
- Understand the Domestic Violence against Women in family and Society.
- Know about Violence against Women in Media.
- Know about Prevention of Domestic Violence against Women.

Learning Outcomes
On completion of the course the student will be able to
- Understand the domestic violence against women in family & society.
- Identify the preventive programs against women's violence

UNIT – I INTRODUCTION **6 Hour**

Discrimination at Different Stages - Fetus & Infancy – Childhood – Adolscence – Adult Marriage – Pregnancy – Motherhood and Old Age – Types of Harassment – Patriarchy.

UNIT – II TYPES OF VIOLENCE AGAINST WOMEN **6 Hour**

Physical- Sexual- Emotional- Verbal- Economic- Causes to Effects – Causes of Domestic Violence-Female Infanticide in India -Domestic violence against Domestic help.

UNIT -III ACTS AGAINST DOMESTIC VIOLENCE **5 Hour**

Advocacy on Behalf of Battered Women - Violence Against Women Act: Domestic Violence Act 2005 - Child marriage - Eve teasing - Sati - Dowry Prohibition Act.

UNIT - IV VIOLENCE IN MEDIA **5 Hour**

Serials – Advertisement- Movies- Journals-News Paper– Magazines-Counseling Programs.

UNIT -V CONTINUING AND EMERGING ISSUES **5 Hour**

Violence against Older Women - Violence against Women with Disabilities- Human Trafficking- Stalking - Violence against Women as Human Rights: NGO Activity- School based Education and Prevention Programs.

Reference Books

- Claire, M. Renzetti. Jeffrey, L. Edleson. Kennedy Bergen. (2011). *Source Book on Violence against Women*. Sage Publication. (2nd Ed.).
- Vera Anderson. (1997). *A Women Like You: The Face of Domestic Violence.* First edition. Sear Press.
- Whalen, B.J. (2010). *Justifiable Homicide: Battered Women Self Defense and the Law*. London Publication. (2nd Ed.).
- Roy, M.K. Ajay Varma. (2000). *Violence against Women*. Commonwealth Publication.
- Larva, M. Purdy. Wanda Teays. Stanley, G. French. (1998). *Violence against Women: Philosophical Perspective*. Cornell University Press. (1st Ed.).

WOMEN AND HEALTH

UWSV504

Semester :V **Credit :1**
Category: Value Education **Hour/Week :2**
Class & Major :III UG **Total Hour :26**

Objectives:
To enable the students

- Know about the Physiology of Women.
- Realize the Role of Gender in Women's Health Issue.

Learning Outcomes:
On completion of the course the student will be able to

- Know about the Physiology of Women.
- Understand the Importance of Nutritional Diet and Post Pregnancy Care.
- Realize the Role of Gender in Women's Health Issue.

UNIT-I ANATOMY AND PHYSIOLOGY OF WOMEN 4 Hour

Review of Genitor – Urinary System of Female Organs- Structure Physiology – Internal and External Organs of Reproduction.

UNIT-II PUBERTY 6 Hour

Need ofKnowledge of Menstruation- Menstrual Symptoms- How to Handle Menstruation Problem- Menstrual Disorders – Importance of Maintaining the Good Personal Hygiene - Misbelieves.

UNIT – IIIPREGNANCYCARE 7 Hour

Motherhood as a Fulfilling Experience - Stages of Pregnancy – Need of Regular Check Up – Nutritional Diet – Post Pregnancy Care.

UNIT- IV COMMON HEALTH PROBLEM AND HEALTH CARE 5 Hour

Lack of Nutritional Diet and Diseases - Anemic- Irregular Menstrual Cycle – Thyroid Problem - Ovarian and Cervical Cancer- Breast Cancer – Fibroid – Importance of Exercises.

UNIT - V HEALTH AND GENDER 4 Hour

Health as a Gender Issue – Illiteracy – Rural, Urban Education and its Role in Women Health – Infant Mortality Rate (IMR) – Nutritional Disorders between Men and Women – Gender Bias and Family Planning.

Reference Books

- Aryasadhana. (2000). *Women, Gender Equity and the State*. Deep and Deep Publications. New Delhi.
- Behraman, J. Deoalikal, A. (2002).*Health and Nutrition Handbook of Development Economics*. North Hooland. Amsterdam.
- Diana M. Fraser.(2004).*Myles Text Book for Midwives.* Churchill Livingtance.

SOFT SKILLS

PREAMBLE

Course Profile and Syllabi for Soft Skills offered to under Graduate Students is presented in this Booklet. This comes into Effect from 2021 – 2024 Batch onwards.

UG - COURSE PROFILE FOR SOFT SKILLS

Semester	Part	Course code	Course title	Contact Hour/Week	Credit
IV	IV	USKS401	Life Coping Skills	2	1
		USKS402	Personality Development	2	1
VI	IV	USKS601	Career Skills	2	1
		USKS602	Job Skills	2	1

LIFE COPING SKILLS
USKS 401

Semester : IV **Credit : 1**
Category : Soft Skills **Hour/Week: 2**
Class : II UG **Total Hour : 26**

Objectives:

To enable the students

- Cope with Depression.
- Develop Ability to Cope with Anger and Fear.
- Develop Confidence.

Learning Outcomes:

On completion of this course the student will be able to

- Understand causes of Depression and ways to Overcome Depression.
- Identify the Different kinds of Fear and ways to Overcome Fear.
- Identify the Causes and Sources of Stress .

UNIT - I COPING WITH DEPRESSION **6 Hour**

Definition – Symptoms – Causes of depression – Impact of depression – How to Overcome Depression and Regain a Positive Outlook.

Exercise:

- Students to depict depression and its evil reflect on human personality.
- Group discussion to find out ways to confront with depression.

Reference:www.effexorxr.com

www.iugm.qc.ca

UNIT - II COPING WITH FEAR **5 Hour**

Definition –Kinds of Fear – Handling Fear – Coping with Fear – Ways to Overcome fear- Tips to Cope with Fear.

Exercise: Students to prepare list of current life situation that regret fear.

Reference :www.counsellingzone.com

Swami Sukhabodhanandha, *Oh, Mind Relax Please!*, Author House, 2005.

UNIT - III COPING WITH ANGER **5 Hour**

Introduction – Is Anger Good or Bad? – Ways of Determining Your Anger Responses – Consequences of Anger – 13 Steps towards Anger Management – Five Ways to Handle Anger.

Exercise: Students to identify five ways to handle anger.

Reference: Les Carter. Frank B. Minirth. (1998). *The Anger Work Book*. T. Nelson.

UNIT - IV COPING WITH FAILURE& CRITICISM **5 Hour**

Introduction – Positive Attitude towards Failure – Winners Vs Looser – Coping with Failure – Definition of Criticisms – Types of Criticism – Our Response to Criticism – Coping with Criticism – Self Criticism.

Exercise:

- Brainstorming session to identify the reason for the failure.
- To identify attitude of students towards failure.
- Exercise on response to criticism by others.

Reference: Chandru Gidwani. (2001). Ten *Secrets to a Balanced Successful and Happy Life*. Mumbai. Better Yourself Book.

UNIT - VSTRESSMANAGEMENT **5 Hour**

Definition – Kinds of Stress – Types of Stress – Causes of Stress – Sources of Stress – Response to Stress – Control Negative Stress – How to Manage Stress – Ten Commandments for Management Stress.

Exercise:

- Students to Identify Stress, they are undergoing Currently.
- To Identify Stressful Situations and Responses to Situation.

Reference: Les Carter. Frank B. Minirth, (1998). *The Anger Work Book*. T. Nelson.

EVALUATION COMPONENTS

1.	Poster Presentation	-	20Marks
2.	Chart Presentation-		20Marks
3.	Oral Presentation-		20Marks
4.	Ideas in Brainstorming-		20Marks
5.	Group Discussion-		20 Marks
	Total		100Marks

PERSONALITY DEVELOPMENT

USKS402

Semester :IV **Credit: 1**
Category :Soft Skills **Hour/Week : 2**
Class : II UG **Total Hour: 26**

Objectives:

To enable the students

- Achieve Self Actualization.
- Create Self Acceptance and Positive Attitude.
- Develop Decision Making Skill.

Learning Outcomes:

On completion of this course the student will be able to

- Understand the concept of Self Esteem and Self Acceptance.
- Know to Turn Negative Thinking Patterns into Positive.
- Realize the Importance of Goal setting and Decision Making Skills.

UNIT -I SELF **5 Hour**

Self Esteem, Self Acceptance, Johari Window Exercise: Expressing Feelings about Self.

Reference: Shiv Kera. (1998).*You Can Win*. MacMillan India Ltd. New Delhi.

Dr.Mani Jacob. (2002). *Resource Book for Value Education*. Institute of Value Education.

UNIT – II POSITIVE THINKING **5 Hour**

Definition – Characteristics of Good Personality - Power of Positive Thinking – Learn to Turn Negative Thinking Patterns.

Exercise: Story of Positive Thinking.

Reference: Shiv Kera. (1998). *You Can Win*. MacMillan India Ltd. New Delhi.

Arindam Chaudhuri. (2001). *Count Your Chickens before they Hatch.* Vikas Publishing House Ltd. New Delhi.

UNIT - III MOTIVATION AND SELF ACTUALISATION **6 Hour**

Meaning – Motivation Leads to Self Actualization – Difference between Inspiration and Motivation – Needs of Motivation to Demotivation.

Exercise: Case Studies of Achievers in Great Leaders to Examine their Motives.

Reference: Shiv Kera. (1998).*You Can Win*. MacMillan India Ltd. New Delhi.

Dr.Mani Jacob. (2002).*Resource Book for Value Education*. Institute of Value Education.

UNIT – IV GOAL SETTING **5 Hour**

Definition – Focus on the Goals – Importance – Dreams and Goals – Obstacles to set Goals – Types of Goals – Scrutinize your Goals – Goals must be Balanced.

Exercise: Each Group gets Ball and a Bucket or Box. Each one of the Group takes a Turn and Tries to Throw the Ball into the Bucket from the Distance of 5 meter.

Reference: Shiv Kera. (1998). *You Can Win*. MacMillan India Ltd. New Delhi.

Dr.Mani Jacob. (2002). *Resource Book for Value Education*. Institute of Value Education.

UNIT – V DECISION-MAKING SKILLS **5 Hour**

Introduction – Decision Making Process – '5 Cs' of Decision Making.

Exercise: Students could be Asked to be in Groups of Six and go through the Process of Decision making by giving them Matter for Decision Making.

Reference: Shiv Kera. (1998). *You Can Win*. MacMillan India Ltd. New Delhi.
Alanbarker. (1996). How *to be a Better Decision Maker.* Kogan Page. India Pvt Ltd. New Delhi.

EVALUATION COMPONENTS

SWOT Analysis of Self (Chart)	20 Marks
Need Hierarchy Self (Chart)	20 Marks
Oral Presentation (of Self Mission, Goals)	20 Marks
Group Discussion	20 Marks
In Basket Method	20 Marks
Total	**100 Marks**

CAREER SKILLS
USKS601

Semester : VI **Credit : 1**
Category : Soft Skills **Hour/Week : 2**
Class : III UG **Total Hour : 26**

Objectives:

To enable the students

- Develop Leadership Skill.
- Plan for Future Career.
- Develop the Qualities to Work as Team.

Learning outcomes:

On completion of this course the student will be able to

- Understand the Attributes for a Good Leader.
- Develops the Qualities to Work as Team.
- Understand the various Sources of Career Placement for Choosing a Career.

UNIT –I LEADERSHIP **5 Hour**

Meaning – Traits of Leadership - Leaders Vs Managers - Attributes for a Good Leader Exercise: To Conduct Role Play of each Style of Leadership.

Reference:

- Hariharan, S. Sundararajan, S. Shanmughapriya, S.P. (2010). *Soft Skills*. MJP Publishers. Chennai.

UNIT – II TEAM BUILDING **6 Hour**

Group Dynamics and Group Behavior – Morale - Interpersonal Relationship – Conflict – Grievances Procedure.

Exercise: To Conduct Team Work for Analyses their Contribution of the Task.

Reference:

- Hariharan, S. Sundararajan, S. Shanmughapriya, S.P. (2010). *Soft Skills*. MJP Publishers. Chennai.
- Aswathappa. *Organizational Behavior*. Tata McGraw Hill Publication. New Delhi.

UNIT – III OFFICE CORRESPONDENCE **4 Hour**

Lay out of the Business Letters – Memos – Circular – Agenda – Minutes.

Exercise: To Give Situation of Business Proposals for Preparing Letter.

Reference: Rajendra Paul. Korlahalli. (1999). *Business Communication*. Sultan Chand. New Delhi.

UNIT – IV CAREER GUIDANCE **6 Hour**

Meaning – Definition – Principles of Career Guidance – Objectives – Components.

Exercise: The Faculty should Introduce to the Students Magazines like Competition Success and Career Digest and Ask the Students to go through them and Find out how they Help them in choosing a Career.

Reference:

- Dr. Xavier Alphonse, S. (1999). *Change or be Changed*. Sultan Chand. New Delhi.

UNIT – V CAREER PLANNING **5 Hour**

Introduction – Four Step Process – Sources of Career Placements – Choosing a Career

Exercise: The Faculty should Introduce to the Students Magazines like Competition Success and Career Digest and Ask the Students to go through them and find out how they Help them in choosing a Career.

Reference: Hariharan, S. Sundararajan, S. Shanmughapriya, S.P. (2010). *Soft Skills*. MJP Publishers. Chennai.

EVALUATION COMPONENTS

Role Play	20 Marks
Group Discussion	20 Marks
Writing Business Letters	20 Marks
Log Book Preparation	20 Marks
Poster Presentation	20 Marks
Total	**100 Marks**

JOB SKILLS
USKS602

Semester : VI **Credit : 1**
Category : Soft Skills **Hour/Week : 2**
Class : III UG **Total Hour : 26**

Objectives:

To enable the students

- Prepare Resumes.
- Face Interviews.
- Participate in Group Discussion.

Learning outcomes:

On completion of this course the student will be able to

- Develop Skills to Prepare Resumes.
- Know the Principle of Psychological Testing.
- Enhance Qualities to Participate in Group Discussion and Face Interview.

UNIT - I C.V / RESUME WRITING SKILLS **5 Hour**

Writing of C.V, Memos, e-mail Writing

Exercise**:**

- To Prepare Resume.
- To Write Covering Letters for Different Situation.

Reference: Rajendra Paul. Korlahalli. (1999). *Business Communication*. Sultan Chand. New Delhi.

UNIT – II APTITUDE TEST **6 Hour**

Meaning – Types of Test – Principles of Psychological Testing – Applications – Issues - Psychometric Properties – Thematic Apperception Test, Rorschach Inkblot Test.

Exercise: Psychological Testing to Identify Individual Differences.

Reference: Robert, M. Kaplan. Dennis, P. Saccuzzo. (1993). *Psychological Testing*. Books / Cole Publishing Company.

UNIT - III INTERVIEW TECHNIQUES– I **5 Hour**

Preparing for Interview, Facing Interviews, Types of Interview

Exercise : Mock Interview.

Reference : Hariharan, S. Sundararajan, S. Shanmughapriya, S.P. (2010). *Soft Skills*. MJP Publishers. Chennai.

UNIT - IV INTERVIEW TECHNIQUES– II **6 Hour**

Bargaining, Mock Interview, Do's and Don'ts of Interview

Exercise: Mock Interview.

Reference: Hariharan, S. Sundararajan, S. Shanmughapriya, S.P. (2010). *Soft Skills*. MJP Publishers. Chennai.

UNIT - V GROUP DISCUSSION **4 Hour**

Introduction – Different Kinds of GD Topics – Outcome of GD – Structure of GD – How To Prepare for GD – Successful GD Techniques - Do's and Don'ts of GD.

Exercise: To segregate the Students as each Group and give the Topic Spontaneously and Test to the Soft Skills of Students.

Reference: Hariharan, S. Sundararajan, S. Shanmughapriya, S.P. (2010). *Soft Skills*. MJP Publishers. Chennai.

EVALUATION COMPONENTS

1. Resume Writing	- 20 Marks
2. Memo Writing	- 20 Marks
3. Projective Test	- 20 Marks
4. Mock Interview	- 20 Marks
5. Group Discussion	- 20 Marks
Total	**- 100 Marks**