THEIVANAI AMMAL COLLEGE FOR WOMEN (AUTONOMOUS)

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

ACADEMIC COUNCIL BOOKLET – XII
Arts, Science & IQAC

23rd & 24th September 2020

தமிழாய்வுத்துறை

இளங்கலைத்தமிழ்

முகவுரை

முதல் மற்றும் ஆறு பருவங்களுக்குரிய பாடத்திட்ட வடிவமைப்புகள் இடம்பெற்றுள்ளன. **ஐந்து மற்றும் ஆறாம்** பருவத்திற்கு உரிய முதன்மைப்பாடங்கள் மற்றும் துறைச்சாரா விருப்பப்பாடங்கள் ஆகியவற்றிற்கு உரிய பாடத்திட்டங்கள் மற்றும் அக மதிப்பீட்டுக்கூறுகள் இடம் பெற்றுள்ளன. **(2018 - 2021 ஆம் கல்வியாண்டுகளில் பயிலும் மாணவியருக்கு 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.
- சமூக நிறுவனங்கள் மற்றும் ஊடகங்களில் பணி வாய்ப்பினைப் பெறுதல்.

பருவம்	பிரிவு	வகை	பாடக் குறியீடு	பாடத்தலைப்பு	முன் பாடக் குறியீடு	வாரம் மணி நேரம்	தரம் Min/ Max
I	I	தமிழ்	UTAL105/ UTAL106	பொதுத்தமிழ் - I / சிறப்புத்தமிழ் - I	UTAL103/ UTAL104	4	2/3
	II	ஆங்கிலம்	UENL107/ UENL108	Basic English - I / Advanced English - I	UENL106	5	3/4
	III	முதன்மைப்பாடம் - I	UTAM102	நன்னூல் - எழுத்ததிகாரம்	-	6	5
		முதன்மைப்பாடம் - II	UTAM106	தமிழக வரலாறும் பண்பாடும்		6	5
		முதன்மைப்பாடம் - III	UTAM108	நவீன இலக்கியங்கள்	UTAM105	5	4
		முதன்மைப்பாடம் - IV	UTAM109	மொழித்திறன்	UTAM107	2	1
	IV	மதிப்பீட்டுக் கல்வி			-	2	1
				மொத்தம்		**30**	**21/23**
II	I	தமிழ்	UTAL205/ UTAL 206	பொதுத்தமிழ் - II/ சிறப்புத்தமிழ் - II	UTAL203/ UTAL204	4	2/3
	II	ஆங்கிலம்	UENL207/ UENL208	Basic English - II/ Advanced English - II	UENL206	5	3/4
	III	முதன்மைப்பாடம் - V	UTAM202	நன்னூல் - சொல்லதிகாரம்	-	5	5
		முதன்மைப்பாடம் - VI	UTAM205	மொழி வரலாறு	-	4	4
		முதன்மைப்பாடம் - VII	UTAM206	சிற்றிலக்கியங்கள்	UTAM206	4	4
		முதன்மைப்பாடம் - VIII	UTAR201	பயிற்சிப் பட்டறை – I	-	2	1
	IV	துறை சாரா விருப்பப்பாடம் - I			-	4	2
		திறன்சார்கல்வி			-	2	1
	V	கூடுதல் செயல்பாடு (Extension Activites)			-	-	2
				மொத்தம்		**30**	**23/26**

III	I	தமிழ்	UTAL 305/ UTAL306	பொதுத்தமிழ் - III / சிறப்புத்தமிழ் - III	UTAL303/ UTAL304	4	2/3
	II	ஆங்கிலம்	UENL 307/ UENL 308	Basic English - III / Advanced English - III	UENL306	5	3/4
	III	முதன்மைப்பாடம் - IX	UTAM303	யாப்பருங்கலக்காரிகை	-	6	5
		முதன்மைப்பாடம் - X	UTAM304	காப்பியங்கள்		5	5
		முதன்மைப்பாடம் - XI	UTAM306	மொழியியல்	UTAM305	6	5
	IV	முதன்மைப்பாடம் - XII	UTAR301	பயிற்சி பட்டறை - II		2	1
		மதிப்பீட்டுக்கல்வி				2	1
				மொத்தம்		**30**	**22/24**
IV	I	தமிழ்	UTAL405/ UTAL406	பொதுத்தமிழ் - IV/ சிறப்புத்தமிழ் - IV	UTAL403/ UTAL404	4	2/3
	II	ஆங்கிலம்	UENL407/ UENL 408	Basic English - IV/ Advanced English - IV	UENL406	5	3/4
	III	முதன்மைப்பாடம் - XIII	UTAM401	புறப்பொருள் வெண்பாமாலை	-	5	5
		முதன்மைப்பாடம் - XIV	UTAM405	அற இலக்கியங்கள்	-	5	5
		முதன்மைப்பாடம் - XV	UTAM404	தமிழ் இலக்கண நூல்கள்	-	4	4
		முதன்மைப்பாடம் - XVI	UTAP501/ UTAM510	திட்டக்கட்டுரை/ஊடகத்தமிழ்		2	-
	IV	துறைசாரா விருப்பப்பாடம் - II (Online Course)		Online Course (Spoken Tutorial/NPTEL)	-	3	1/2
		திறன்சார் கல்வி			-	2	1
	V	கூடுதல் செயல்பாடு (Extension Activites)					2
				மொத்தம்		**30**	**21/26**
V	III	முதன்மைப்பாடம் - XVII	UTAM505	இதழியல்	-	6	5
		முதன்மைப்பாடம் XVIII	UTAM506	சமய இலக்கியம்	-	6	5
		முதன்மைப்பாடம் - XIX	UTAM509	நம்பியகப்பொருள்	UTAM403	6	6
		முதன்மைப்பாடம் - XX	UTAP501/ UTAM510	திட்டக்கட்டுரை / ஊடகத்தமிழ்	-	4	4/5
		சார்புப் பாடம்	UCSA505	தமிழ்க்கணினி	-	6	5
	IV	மதிப்பீட்டுக்கல்வி				2	1
				மொத்தம்		**30**	**26/27**
VI	III	முதன்மைப்பாடம் - XXI	UTAM603	இலக்கியத் திறனாய்வியல்	-	5	5
		முதன்மைப்பாடம் - XXII	UTAM604	சொற்பொழிவுக்கலை	-	5	5
		முதன்மைப்பாடம் - XXIII	UTAM607	தண்டியலங்காரம்	-	6	5
		முதன்மைப்பாடம் -XXIV	UTAM609	சங்க இலக்கியம்	-	5	5
		முதன்மைப்பாடம் - XXV	UTAR601	பயிற்சி பட்டறை - III	-	2	1
		துறைசசார் விருப்பாடம்	UTAO601	நாட்டுப்புறவியல்	-	5	4
	III	புறவாய்மொழித் தேர்வு	UTAC606	மீள் ஆய்வு	-		1
	VI	திறன்சார்கல்வி			-	2	1
	V	கூடுதல் செயல்பாடு (Extension Activites)			-		2
				மொத்தம்		**30**	**27/29**
				கூட்டு எண்ணிக்கை		**180**	**140/155**

துறை சாரா விருப்பப்பாடம் (பிறதுறை மாணவியர்க்கு மட்டும்)

பருவம்	பிரிவு	வகை	பாடக் குறியீடு	பாடத்தலைப்பு	வாரம் மணி நேரம்	தரம்	
						Min	Max
II	IV	துறை சாரா விருப்பப்பாடம் -I	UTAE202	படைப்புக்கலை	4	2	2
			UTAE203	தமிழ்ப் பெண் படைப்பாளர்களின் படைப்புகள்			
			UTAE204	தமிழ்ப் பண்பாட்டு வரலாறு			

கோடைக்கால 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

தன் விருப்பப்பாடம் (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			

EXPERIENTIAL LEARNING (MANDATORY/ONLY FOR INTERESTED STUDENTS)

Course Mapping				Collaborating Agency – MSME		
Sem	**Course Code**	**Course Title**	**Assessment**	**Course Title**	**Hours / Days / month**	**Mode of Evaluation**
IV	Beautian Course Training	4 Days	May	Msme Course	Certificate	IV

SKILL ORIENTATION PROGRAMME

(MANDATORY/ONLY FOR INTERESTED STUDENTS)

Semester	Catagory	Course code	Course title	Collaborating Agency	Hours/Days/Month	Mode of Evaluation	Credit Min /Max
V		**UTAT101**	Social Media Marketing Training	Tcil	2 Days	Certificate	**- /1**

இதழியல்
UTAM505

பருவம் : ஐந்தாம் பருவம் **தரம்** : 05
பிரிவு : முதன்மைப்பாடம் - XVIII **மணிநேரம் /வாரம்** : 06
வகுப்பு : III B.A. தமிழ் **மொத்த மணிநேரம்** : 78

கற்றலின் நோக்கம்

மாணவியர்,

- இதழ்களைப்பற்றிய தகவல்களை அறிந்து கொள்ளல்.
- இதழ்களுக்குப் படைப்புகளை அனுப்புவதற்கான முறைகளைக் கண்டறிதல்.
- தற்கால இதழியல் வளர்ச்சிப் போக்குகளைத் தெரிந்து கொள்ளுதல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- இதழாசிரியராக மாறுவதற்கான தகுதிப்பாட்டை பெறுவர்.
- இதழியல் துறையில் பணிவாய்ப்பினை அடைவர்.

அலகு - I இதழியல் **14 மணி நேரம்**

இதழியல் விளக்கம் - இதழ்களின் வகைகள், இதழ்கள் சுதந்திரம் - நடத்தை அறக் கோட்பாடுகள் - இதழியல் தொழில் வாய்ப்புகள்.

அலகு - II இதழியல் வளர்ச்சி நிலைகள் **20 மணி நேரம்**

இதழியல் வளர்ச்சி வரலாறு - தமிழகத்தில் இதழியல் வளர்ச்சி - பத்திரிகைச் சட்டங்கள் - பத்திரிகை மன்றம் - இதழ்கள் தொடங்குவதற்குரிய வழிமுறை - செய்தித்தாள் நிர்வாக அமைப்பு.

அலகு - III செய்திகள் **15 மணி நேரம்**

செய்தியாளர் - செய்தி - செய்தியின் உள்ளடக்கங்கள் - செய்தித் திரட்டுதல் - இந்திய நாட்டில் இதழியல் உரிமைகள் - சட்டம் - செய்தித் தணிக்கை, இந்திய இதழியல் வரலாறும் போக்குகளும், ஓர் இதழைக் தொடங்கி நடத்தும் முறை, மாணவர்கள் இதழ்கள் தயாரித்தல் பயிற்சி.

அலகு - IV விளம்பரம் **14 மணி நேரம்**

விளம்பரக் கலையின் தோற்றமும் வளர்ச்சியும் - வகைகள்.

அலகு - V இதழ்கள் **15 மணி நேரம்**

சிற்றிதழ்கள் - இன்றைய நாளிதழ்கள், பருவ இதழ்கள், ஆய்விதழ்கள்.

பாடநூல்கள்

- குருசாமி,மா.பா. (2005). *இதழியல் கலை.* ஆதித்தனார் கல்லூர். திருச்செந்தூர்.
- இராசா, கி. (2010). *மக்கள் தகவல் தொடர்பியல்.* பாவை பப்ளிகேஷன்ஸ். சென்னை.

பார்வை நூல்கள்

- சுரேஷ்பால். (2012). *மீடியா உலகம்.* தீபிகா பதிப்பகம். சென்னை.
- செல்வம், கோ. (2010). *உங்கள் வானொலி.* புவனம் பதிப்பகம். சென்னை,

சமய இலக்கியம்

UTAM506

பருவம் : ஐந்தாம் பருவம் **தரம்** : 05
பிரிவு : முதன்மைப்பாடம் - XVII **மணிநேரம்/வாரம்** : 06
வகுப்பு : III B.A. தமிழ் **மொத்த மணிநேரம்** : 78

கற்றலின் நோக்கம்

மாணவியர்,

- காலந்தோறும் சமய இலக்கியங்களின் வளர்ச்சி நிலையை அறிந்து கொள்ளுதல்
- சமய இலக்கியக் கோட்பாடுகளை அறிந்து கொள்ளுதல்
- சமய இலக்கியங்களின் வழி தல வரலாறுகளைத் தெரிந்து கொள்ளுதல்

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- சமய இலக்கியங்களின் வழியாக சமயக்கருத்துக்களை அறிவர்.
- இறை வழிபாட்டின் மூலம் மக்களிடம் மனிதநேயத்தை வளர்ப்பர்.

அலகு - I சைவ இலக்கியங்கள் 14 மணி நேரம்

திருஞானசம்பந்தர் தேவாரம் (இடர்களையும் பதிகம் - மறையுடையார் எனத் தொடங்கும் பாடல்) - திருநாவுக்கரசர் தேவாரம் (நமச்சிவாய திருப்பதிகம் - சொற்றுணை வேதியன்) - மாணிக்கவாசகர் திருவாசகம் (நீத்தல் விண்ணப்பம் முதல் பத்து பாடல்கள்) - சுந்தரர் (மற்றுப்பற்றெனக்கின்றி எனத் தொடங்கும் பத்துப்பாடல்கள்).

அலகு – II வைணவ இலக்கியங்கள் 20 மணி நேரம்

குலசேகராழ்வார் (திருமலை தொடர்பு வேண்டல் - ஊனேறு சங்கத்து உடற்பிறவி என்று தொடங்கும் முதல் பத்து பாடல்கள்) - பெரியாழ்வார் திருப்பல்லாண்டு ஆண்டாள் திருமொழி (முதல் பத்து பாடல்கள்) - தொண்டரடிப் பொடியாழ்வார் திருப்பள்ளி எழுச்சி (முதல் பத்துப் பாடல்கள்).

அலகு – III சித்தர் இலக்கியங்கள் 15 மணி நேரம்

திருமூலரின் திருமந்திரம் (யாக்கை நிலையாமை முதல் பத்து பாடல்கள்) - சிவவாக்கியர் - ஈணெருமை எனத் தொடங்கும் பாடல் (151 - 160 பாடல்கள்) - பட்டினத்தார் பாடல்கள் நெஞ்சொடு புலம்பல் முதல் பத்துப் பாடல்கள்.

அலகு - IV சமண, பௌத்த இலக்கியங்கள் 14 மணி நேரம்

சிறுபஞ்சமூலம் பொருளுடையான் எனத் தொடங்கும் பாடல்கள் (முதல் பத்துப் பாடல்கள்) - நாலடியார் - கல்வி (131 - 140 பாடல்கள்) - ஆசிய ஜோதி முழுவதும்.

அலகு - V கிறித்துவ, இசுலாமிய இலக்கியங்கள் 15 மணி நேரம்

தேம்பாவணி - ஐயம் நீங்கு படலம் (முதல் பத்துப்பாடல்கள்) - சீறாப்புராணம் - மழைப்பிழைத்த படலம் (முதல் 20 பாடல்கள்).

பாடநூல்கள்

- கந்தசாமி சோ.ந. (2010). *திருமுறை இலக்கியம்.* உலகத் தமிழாராய்ச்சி நிறுவனம். சென்னை.
- அருணாசலம்.ப. (2011). வைணவ சமயம். பாரி புத்தகப் பண்ணை. சென்னை.

பார்வை நூல்கள்

- கிருஷ்ணபிரசாத். (2014). *பட்டினத்தார் பாடல்கள்.* காவ்யா பதிப்பகம். சென்னை.
- மஸ்தான் *சாகிபு பாடல்கள். (2014).* மணிவாசகர் பதிப்பகம். சென்னை.
- மாணிக்கவாசகன், ஞா. (2013). *பதினெண் கீழ்க்கணக்கு நூல்கள்.* ஊமா பதிப்பகம். சென்னை.
- நூராயணசாமி, க. (2010). *சித்தர் தத்துவம்.* தமிழ்ப் புத்தகாலயம். திருவல்லிக்கேணி. சென்னை.

நம்பியகப் பொருள்
UTAM 509

பருவம்	: ஐந்தாம் பருவம்	**தரம்**	: 6
பிரிவு	: முதன்மைப்பாடம் -XIX	**மணி நேரம்/வாரம்**	: 6
வகுப்பு	: III BA தமிழ்	**மொத்த நேரங்கள்**	: 78

கற்றலின் நோக்கம்

மாணவியர்,

- அகத்திணைக்கான இலக்கணக் கூறுகளை அறியச் செய்தல்.
- சங்க இலக்கிய அகநூல்களை இலக்கணத்தோடு பொருத்தி பார்க்கச் செய்தல்.
- தமிழ் மொழியின் தொன்மையான இலக்கியங்களைப் பற்றிய புரிதலை இலக்கணம் வழி அறிதல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- அகத்திணைக்கான இலக்கணக் கூறுகளை ஆய்வர்.
- சங்க இலக்கிய அகநூல்களை இலக்கணத்தோடு பொருத்திப் பார்ப்பதில் நிபுணத்துவம் பெறுவர்.
- இலக்கியங்களை இலக்கணங்களின் வழி ஆராயும் திறன் பெறுவர்.

அலகு - I அகத்திணையியல் 14 மணி நேரம்

அகப்பொருளின் வகைகள் - திணையின் பெயர் - ஐந்திணைக்கும் உரிய பொருள்கள் - முதல், கரு, உரிப்பொருள்கள் - கைக்கோள் - கைக்கிளை - களவு பிரிவு - வரைவு - அறத்தொடு நிற்றல்- கற்பு பிரிவு.

அலகு - II அகத்திணையியல் - களவியல் 20 மணி நேரம்

ஊடல் - ஊடல் தணிக்கும் வாயில்கள் - செலவழுங்கல் - களவியல் - களவின் இயல்பு - கைக்கிளையின் பாகுபாடு - களவிற்கு உரிய கிளவிகள் - தெய்வப்புணர்ச்சி - வன்புறை - தெளிவு - பிரிவுழி மகிழ்ச்சி - பிரிவுழி கலங்கல் - இடந்தலைப்பாடு - பாங்கற் கூட்டம் - பாங்கி மதி உடன்பாடு.

அலகு - III களவியல் 15 மணி நேரம்

பாங்கியிற் கூட்டம் - பகற்குறி - ஒருசார் பகற்குறி - பகற்குறி இடையீடு - இரவுக்குறி - இரவுக்குறி இடையீடு - வரைதல் வேட்கை - வரைவு கடாதல் - ஒரு வழி தணத்தல் - வரைவிடை வைத்து பொருள்வயின் பிரிதல்.

அலகு - IV வரைவியல் 14 மணி நேரம்

வரைவின் இலக்கணம் - கிளவித்தொகை - வரைவு மலிதல் -அறத்தொடு நிற்றல் - களவு வெளிப்பாடு - உடன் போக்கு - கற்பொடு புணர்ந்த கவ்வை - மீட்சி - வரைதல் - உடன்போக்கு இடையீடு.

அலகு - V கற்பியல் 15 மணி நேரம்

கற்பின் இலக்கணம் - கற்பிற்குரிய கிளவித் தொகை - இல்வாழ்க்கை - பரத்தையிற் பிரிவு - ஊடல் வகைகள் - ஓதல் முதலாகிய ஐவகைப் பிரிவுகள்

பாட நூல்கள்

1. நாற்கவிராச நம்பி, (1990). *நம்பி அகப்பொருள்.* கழக வெளியீடு. சென்னை.
2. திருஞானசம்பந்தர், ச. (2010). *அகப்பொருள் விளக்கம்*, கதிர் பதிப்பகம், மூன்றாம் பதிப்பு. திருவையாறு.

பார்வை நூல்கள்

1. வைத்தியநாத தேசிகர். (1980). *நம்பியகப்பொருள்.* சரஸ்வதி மஹால். தஞ்சாவூர்.
2. மாணிக்கம், வ. சுப (1990). *தமிழ்க் காதல்.* மணிவாசகர் பதிப்பகம்.
3. தேவிரா. (2012). நம்பியகப்பொருள் விளக்கம் தேவிரா உரை. நந்தினி பதிப்பகம். சென்னை.

ஊடகத்தமிழ்

UTAM510

பருவம் : ஐந்தாம் பருவம் **தரம்** : 04

பிரிவு : முதன்மைப்பாடம் - XXV **மணிநேரம்/வாரம்** : 02(IV) + 04(V)

வகுப்பு : III B.A. தமிழ் **மொத்த மணிநேரம்** : 78

கற்றலின் நோக்கம்

மாணவியர்,

- தகவல் தொடர்பியல் வரலாற்றினை அறிதல்.
- ஊடகங்களின் வாயிலாக பயிற்சி பெறுதல்.
- ஊடகங்களில் வேலைவாய்ப்பினைப் பெறுதல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- தகவல் தொடர்பியல் வரலாற்றினை அறிவர்.
- அச்சு ஊடகங்களின் ஆதிக்க வளர்ச்சி பற்றி தெரிந்து கொள்வர்.
- நவீன ஊடகங்களின் வழி பல்வேறு வேலைவாய்ப்பினைப் பெறுவர்.

அலகு -I ஊடகத்தின் தோற்றமும் வளர்ச்சியும் **14 மணி நேரம்**

அச்சுக் கலையின் வளர்ச்சி – தமிழ் இதழ்களின் வளர்ச்சி - இதழ் வகைகள் - இயக்க இதழ்கள் - இக்கால இதழ்களின் போக்குகள் - இழிநிலை இதழ்கள் - இதழியல் நெறிமுறைகள்.

அலகு - II அச்சு ஊடகங்கள் **20 மணி நேரம்**

செய்தித்தாள் - செய்தி வரையறை - செய்திகளின் வகைகள் - செய்தி சேகரித்தலும் செம்மையாக்கமும் - செய்தி நிறுவனங்கள் - இதழ்கள் - இதழியலின் தோற்றம் வளர்ச்சி - இதழியலின் பிற துறைகள் - இதழியலின் கூறுகள் - பருவ,வார,மாத இதழ்கள்

அலகு -III வானொலி **15 மணி நேரம்**

வானொலியின் வரலாறு - வளர்ச்சி - நிலைய அமைப்பு - தயாரிப்புப் பணிகள் - பல்வேறு வகை ஒலிபரப்புகள் - பண்பலை ஒலிபரப்புகள் - பிறநாட்டுத் தமிழ் வானொலி ஒலிபரப்புக்கள்.

அலகு -IV தொலைக்காட்சி **14 மணி நேரம்**

தொலைக்காட்சி வரலாறு - நிலைய அமைப்பு - நிலைய அமைப்பு - தயாரிப்புப் பணிகள் - பல்வேறு வகை ஒலிபரப்புகள் - தனியார் தொலைக்காட்சிகள் - தொலைக்காட்சியால் உளவியல் பாதிப்பு.

அலகு - V தமிழ்த் திரைப்பட வரலாறு **15 மணி நேரம்**

திரைப்படங்கள் - அறிமுகம் - இந்திய திரைப்பட வரலாறு - திரைப்படக்கலை - கதை எடுத்துரைத்தல் (திரைக்கதை) - உரையாடல் அமைத்தல் - திரைப்படமொழி - படத்தொகுப்பு - காட்சி அமைப்பு - திரைப்படங்களும் அழகியலும் - திரைப்பட வகைகள் - குறும்படங்கள் - விளம்பரப் படங்கள் - திரைப்படப் படங்களால் ஏற்படும் சமுதாயத் தாக்கம்.

பாட நூல்கள்

- இராசா, கி. (2010). *மக்கள் தகவல் தொடர்பியல்.* பாவை பப்ளிகேஷன்ஸ்.சென்னை.
- குருசாமி, மா.பா. (2011). இதழியல் கலை. ஆதித்தனார் கல்லூரி. திருச்செந்தூர்.

பார்வை நூல்கள்

- சுரேஷ்பால். (2012). *மீடியா உலகம்.* தீபிகா பதிப்பகம். சென்னை.
- செல்வம், கோ. (2010). *உங்கள் வானொலி.* புவனம் பதிப்பகம். சென்னை.
- சமத்துவன், பவா. (2011). *தொலைக்காட்சி உலகம்.* புதுயுகம் செய்முறை செம்மையாக்கம். சென்னை.

இலக்கியத் திறனாய்வியல்

UTAM603

பருவம் : ஆறாம் பருவம் **தரம்** : 05
பிரிவு : முதன்மைப்பாடம் -XX **மணிநேரம்/வாரம்** : 05
வகுப்பு : III B.A. தமிழ் **மொத்த மணிநேரம்** : 65

கற்றலின் நோக்கம்

மாணவியர்,

- இலக்கியங்களைத் திறனாய்வின் அடிப்படையில் அறிந்து கொள்ளுதல்
- சமூகவியல் நோக்கில் இலக்கியத்தை ஒப்பு நோக்குதல்.
- திறனாய்வுக்கோட்பாடுகளை வளர்த்துக்கொள்ளல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- இலக்கியங்களைத் திறனாய்வின் அடிப்படையில் அறிந்து கொள்வர்.
- சமூகவியல் நோக்கில் இலக்கியத்தை ஒப்பு நோக்கும் திறன் பெறுவர்.

அலகு - I திறனாய்வு அறிமுகம் **13 மணி நேரம்**

இலக்கியத் திறனாய்வு - தரமான திறனாய்வாளர் - திறனாய்வு வகைகள் - திறனாய்வால் ஏற்படும் சிக்கல்கள் - உரையாசிரியர்கள் திறனாய்வார்கள்.

அலகு – II இலக்கியப்பாகுபாடுகள் **10 மணி நேரம்**

இலக்கியமும் வாழ்க்கையும் - இலக்கியப்பாகுபாடுகள் - இலக்கிய உணர்ச்சி - கற்பனை - இலக்கியத்தில் கருத்து - உண்மையியல் - குறிக்கோள்நிலை - நடை - இலக்கியத்தில் இயற்கை.

அலகு - III கவிதை **20 மணி நேரம்**

கவிதையின் விளக்கம் - கவிதையின் கூறுகள் - தொடைகள் - கவிதையும் யாப்பு வடிவமும் - சொல்லாட்சி - அணிகள் - உள்ளுறை உவமம் - கவிதை வகைகள் - புதுக்கவிதை விளக்கம் - புதுக்கவிதை போக்குகள் - புதுக்கவிதைக்குரிய பொருள்.

அலகு - IV நாவல் **10 மணி நேரம்**

நாவல் விளக்கம் - நாவலுக்குரிய கதையும், கதைகோப்பும், கதைக்குரிய பொருள் - கதைமாந்தர் - உரையாடல் - கதையமைப்பு - சிறுகதை விளக்கம் - சிறுகதையின் அமைப்பு - புதினம், சிறுகதை வேறுபாடுகள்.

அலகு - V நாடகம் **12 மணி நேரம்**

நாடகம் விளக்கம் - நாடகத்தின் கதைக்கோப்பு பாத்திரங்கள் - நாடக அமைப்புகளும் அவற்றின் இயல்புகளும் - காட்சிகள் அமைப்பு - நாடகத்திற்குரிய இடமும், காலமும் - நாடகத்திற்கும் புதினத்திற்கும் உள்ள வேறுபாடுகள்.

பாடநூல்கள்

- பாலச்சந்திரன், சு. (2011). *இலக்கியத் திறனாய்வு.* நியூ செஞ்சுரி புக் ஹவுஸ். சென்னை.

பார்வை நூல்கள்

- ஞானசம்பந்தன், அ.ச. (2010). *இலக்கியக் கலை.* சைவசித்தாந்தம். சென்னை.
- ஞானமூர்த்தி, தா.ஏ. (2011). *இலக்கியத் திறனாய்வியல்.* ஐந்திணைப் பதிப்பகம். சென்னை.

சொற்பொழிவுக்கலை

UTAM604

பருவம் : ஆறாம் பருவம் **தரம்** : 05
பிரிவு : முதன்மைப்பாடம் -XXI **மணிநேரம்/வாரம்** : 05
வகுப்பு : III B.A. தமிழ் **மொத்த மணிநேரம்** : 65

கற்றலின் நோக்கம்

மாணவியர்,

- பேச்சாளராக மாணவர்களைத் தகுதி பெறச் செய்தல்.
- தன்னம்பிக்கையுடன் நேர்காணல் எதிர்கொள்வதற்குப் பயிற்சி அளித்தல்.
- பேச்சாளர்க்குரிய தகுதிகளை வளர்த்துக் கொண்டு சிறந்த பேச்சாளர் ஆகுதல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- பேச்சாளருக்குரிய தகுதிகளை வளர்த்துக் கொண்டு சிறந்த பேச்சாளராக திகழ்வர்.
- தன்னபிக்கையுடன் நேர்காணல் எதிர்கொள்வதற்கு பயிற்சி பெறுவர்.

அலகு – I பேச்சாளர்குரிய தகுதிகள் **13 மணி நேரம்**

பேச்சாளன் தகுதிகள் - முன்னோடிகள் - இலக்கிய அடிப்படை - அனுபவம் - தனித்தன்மை - முயற்சிகள்.

அலகு – II பல்வகை உரைகள் **13 மணி நேரம்**

பல்வகை உரைகள் - நாட்டுப்புறவியல் - செய்திகள் - மன்றங்கள் - இலக்கியநடை- அவையறிதல்- வருணனைகள் - இணைப்புரைகள்

அலகு - III பேச்சுகளின் வகைகள் **13 மணி நேரம்**

சிந்தனை பேச்சு - நன்மைகள் - சிலேடைகள் - நெகிழ்வுப்பேச்சு ஆற்றல்கள் சங்கங்கள்.

அலகு - IV பயிற்சி அளித்தல் **13 மணி நேரம்**

பயிற்சி அளித்தல் - பேச்சுப் பயிலரங்கங்கள் - மொழிபெயர்ப்பு பயிற்சி அளித்தல்

அலகு – V பயிற்சி அளித்தல் **13 மணி நேரம்**

கலந்துரையாடல் - நேர்காணல் - பேச்சுக்கலையியல் கடைபிடிக்க வேண்டியவை

பாடநூல்கள்

- ஞானசம்பந்தன், கு . (2011). *பேசும் கலை.* நியூ செஞ்சுரி புக் ஹவுஸ். சென்னை.

பார்வை நூல்கள்

- பரமனாந்தம், அ.மு. (2011). பேச்சாளராக. வானதி பதிப்பகம். சென்னை.
- குமரி ஆனந்தன். (2011). *நீங்களும் பேச்சாளராகலாம்.* பாவை பதிப்பகம். சென்னை.

தண்டியலங்காரம்
UTAM607

பருவம் : ஆறாம் பருவம் **தரம்** : 05
பிரிவு : முதன்மைப்பாடம் -XXIII **மணிநேரம்/வாரம்** : 06
வகுப்பு : III B.A. தமிழ் **மொத்த மணிநேரம்** : 78

கற்றலின் நோக்கம்

மாணவியர்,

- இலக்கிய அணி நயங்களைப் பற்றிய அறிவைப் பெறச் செய்தல்.
- இலக்கியங்களை இலக்கணப் பார்வையோடு அடையாளம் காணச் செய்தல்.
- அணி இலக்கணங்களை அறிந்து கொண்டு செய்யுள்களில் பொருத்தி பார்த்தல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- அணி இலக்கணங்களை அறிந்து கொள்வர்.
- இலக்கியங்களை அணி இலக்கணப் பார்வையோடு அடையாளம் காண்பர்.

அலகு – I அணியின் தோற்றம் **14 மணிநேரம்**

அணி விளக்கம் - தண்டியலங்காரம் - அறிமுகம் - தன்மை - வகைகள் - உவமை வகைகள் - உருவகம் வகைகள்.

அலகு - II அணி வகைகள் **20 மணி நேரம்**

தீவகம் - வகைகள் - வேற்றுப்பொருள் வைப்பு அணி - வகைகள் - முன்ன விலக்கு - வகைகள் - வேற்றுமை

அலகு - III அணி வகைகள் **15 மணி நேரம்**

ஏது - வகைகள் - அதிசய அணி - வகைகள் - ஒட்டணி - நுட்பம் - நிரல் நிரை அணி.

அலகு - IV அணி வகைகள் **14 மணி நேரம்**

பரியாய அணி - அவநுதி - வகைகள் - சிலேடை - வகைகள் - மாறுபடு புகழ் நிலையணி - நிதர்சன அணி

அலகு - V அணி வகைகள் **15 மணி நேரம்**

பரிவர்த்தன அணி - வாழ்த்தணி - சீங்கீரண அணி - பாவிக அணி.

பாடநூல்கள்

- தண்டியலங்காரம். (1956). கழக வெளியீடு. சென்னை.

பார்வை நூல்கள்

- தண்டியலங்காரம். (2010). முல்லை நிலையம். தியாகராய நகர். சென்னை.

சங்க இலக்கியம்
UTAM609

பருவம் : ஆறாம் பருவம் **தரம்** : 05
பிரிவு : முதன்மைப்பாடம் - XXIV **மணிநேரம்/வாரம்** : 05
வகுப்பு : III B.A. தமிழ் **மொத்த மணிநேரம்** : 65

கற்றலின் நோக்கம்

மாணவியர்,

- சங்க கால மக்களின் வாழ்க்கை முறைகளை அறிந்து கொள்ளுதல்.
- பழந்தமிழ் இலக்கியங்களைத் தெரிந்து கொள்ளல்.
- இலக்கிய மரபுகளைப் பின்பற்றுதல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- சங்க கால இலக்கியங்களின் மூலம் மக்களின் வாழ்க்கை முறைகளை அறிவர்.
- பழந்தமிழ் இலக்கிய மரபுகளைப் பின்பற்றுவர்.

அலகு – I அக இலக்கியம் (தொகை) **14 மணி நேரம்**

நற்றிணை - (10, 14, 32, 46, 59) - குறுந்தொகை - (3, 15, 20, 40, 43) - கலித்தொகை - முல்லைக்கலி (முதல் 5 பாடல்கள்) - அகநானூறு- (15, 20, 36, 74, 82).

அலகு – II அக இலக்கியம் (பாட்டு) **14 மணி நேரம்**

பட்டினப்பாலை (முழுவதும்).

அலகு – III புற இலக்கியம் (தொகை) **12 மணி நேரம்**

புறநானூறு -(73, 74, 183, 188, 214) - பதிற்றுப்பத்து - பரணர் - சேரன் செங்குட்டுவன் (5-ம் பத்து) முதல் 10 பாடல்கள்.

அலகு – IV புற இலக்கியம் (பாட்டு) **12 மணி நேரம்**

சிறுபாணாற்றுப்படை (முழுவதும்)

அலகு – V அகப்புற இலக்கியம் **13 மணி நேரம்**

பரிபாடல் - திருமால் (15-ம் பாடல்), செவ்வேள் (5-ம் பாடல்), வையை (7-ம் பாடல்).

பாட நூல்கள்

- வையாபுரிப்பிள்ளை, எஸ்.(ப.ஆ). (2010). சங்க இலக்கியம். பாரி நிலையம். சென்னை.
- இராசமாணிக்கனார், ம. (2010). பத்துப்பாட்டு ஆராய்ச்சி. சென்னைப் பல்கலைக்கழகம்.

பார்வை நூல்கள்

- மாணிக்கம், வ.சுப. (2011). *தமிழ்க்காதல்.* பூரி நிலையம். சென்னை.
- வரதராசனார், மு. (2010). *தமிழர் பண்பாடு.* தமிழ்ப் புத்தகாலயம். சென்னை.
- சிதம்பரனார், சாமி. (2011). *எட்டுத்தொகையும் தமிழர் பண்பாடும்.* அறிவுப் பதிப்பகம். சென்னை.

பயிற்சி பட்டறை – III
UTAR601

பருவம்	: ஆறாம்பருவம்	**தரம்**	: 01
பிரிவு	: முதன்மைப்பாடம் - XXV	**மணிநேரம் / வாரம்**	: 02
வகுப்பு	: III B.A தமிழ்	**மொத்த மணிநேரம்**	: 26

கற்றலின் நோக்கம்

மாணவியர்,

- படைப்பாளுமைத்திறன் குறித்து அறிதல்
- பேச்சு மற்றும் நடிப்புத்திறனை வளர்த்தல்
- ஆளுமைத்திறனை மேம்படுத்துதல்

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- படைப்பாளுமையை வெளிப்படுத்துதல்.
- பேச்சு மற்றும் நடிப்புத்திறனை வெளிக்கொணர்தல்
- ஆளுமைத்திறனை மேம்படுத்தி சமூகத்தில் தன்னை நிலைநிறுத்திக் கொள்ளல்.

அலகு – I பேச்சாற்றல் 5 மணி நேரம்

குரல் வளம் - உச்சரிப்பு - மொழிநடை - குரலில் ஏற்ற இறக்கம் - பிழையின்றி பேசுதல் - பேச்சாளனும் வாசிப்பும் - பிறமொழிச்சொற்களை தவிர்த்தல் - பயிற்சி அளித்தல்.

அலகு – II பட்டிமன்றமும் வழக்காடு மன்றமும் 4 மணி நேரம்

கருத்தை வெளிப்படுத்தும் திறன் - சமூகம் பற்றிய தெளிவு - உரையாடல் - துணிவுடன் எடுத்துரைத்தல் - எதிர்மறுத்துரைத்தல்.

அலகு – III நேர்முக வருணணை 6 மணி நேரம்

கோயில் திருவிழா, கலை பண்பாட்டு விழா, விளையாட்டு விழா ஆகியன பற்றிய நேர்முக வருணணைகளை வானொலி, தொலைக்காட்சிக்கு எழுதுவதற்கு பயிற்சி அளித்தல்.

அலகு – IV ஒரங்க நாடகம் 5 மணி நேரம்

வானொலி - தொலைக்காட்சி - திரைப்படத்திற்கு வழங்கப்படும் சூழலைக் கொண்டு ஒரங்க நாடகம் எழுத பயிற்சி அளித்தல்.

அலகு – V நடிப்புத்திறன் 6 மணி நேரம்

மொழிப்புலமை - துறைசார் தெளிவு - உச்சரிப்பு - உணர்ச்சி வெளிப்பாடு - இலக்கிய புலமை - சொற் தேர்வு - செந்தமிழ் நடையில் பேசுதல்.

பாட நூல்கள்

- ஞானசம்பந்தன, கு. (2011). *பேசும் கலை.* நியூ செஞ்சுரி புக் ஹவுஸ். சென்னை.
- இராமலிங்கம், மா. (2010). *புதிய உரை நடை.* தமிழ்ப் புத்தகாலயம். சென்னை.
- பரந்தாமனார், அ.கி. (2010). *நல்ல தமிழ் எழுத வேண்டுமா.* புாரி நிலையம், சென்னை.

நாட்டுப்புறவியல்
UTAO601

பருவம் : ஆறாம் பருவம் **தரம் :** 04
பிரிவு : முதன்மைப்பாடம் -XXII **மணிநேரம்/வாரம் :** 05
வகுப்பு : III B.A. தமிழ் **மொத்த மணி நேரம் :** 65

கற்றலின் நோக்கம்

மாணவியர்,

- நாட்டுப்புறக்கலைகள் வாயிலாக பண்பாட்டுனை அறிந்து கொள்ளல்.
- நாட்டுப்புறப் பாடல்களை தொகுப்பதற்கு பயிற்சி பெற்று தொகுத்து வெளியிடுதல்.
- நாட்டுப்புறத் துறையில் வேலை வாய்ப்பு பெறுதல்.

கற்றலின் பயன்

மாணவியர் இப்பாடத்தினை பயில்வதால்,

- நாட்டுப்புறப் பண்பாட்டினை அறிவர்.
- நாட்டுப்புறத்துறையில் வேலை வாய்ப்பினை பெறுவர்

அலகு - I நாட்டுப்புறவியல் அறிமுகம் 13 மணி நேரம்

நாட்டுப்புறவியல் அறிமுகம் - நாட்டுப்புறவியல் பாடல்கள் - பாடல் வகைகள் - கதைகள் - கதைகள் வகைப்பாடு.

அலகு – II கதைப்பாடல்கள் 13 மணி நேரம்

நாட்டுப்புறக் கதைப்பாடல்கள் - கதைப்பாடல் நம்பிக்கைகளும் பழக்க வழக்கங்களும் - பழமொழிகள் - விடுகதைகள்.

அலகு - III நிகழ்த்துக் கலைகள் 13 மணி நேரம்

புராணக் கதைகள் - கலைகள் - கைவினைப் பொருட்கள் - ஆடல் வகைகள் - கூத்து வகைகள் - நம்பிக்கைகள் - நம்பிக்கைகளின் வகைகள் - நாட்டுப்புற சகுனங்கள்.

அலகு - IV விழாக்கள் 13 மணி நேரம்

நாட்டுப்புற தெய்வங்கள் - நாட்டுப்புற திருவிழாக்கள்.

அலகு – V விளையாட்டுக்கள் 13 மணி நேரம்

நாட்டுப்புற விளையாட்டுக்கள் - நாட்டுப்புற மருத்துவம் - மருத்துவ நம்பிக்கைகள்.

பாடநூல்கள்

- சக்திவேல். சு. (2010). நாட்டுப்புற இயல் ஆய்வு. மணிவாசகர் பதிப்பகம். பாரிமுனை. சென்னை.

பார்வை நூல்கள்

- சக்திவேல், சு. (2011). சமூகக் கதைப்பாடல். தமிழ் பல்கலைக்கழகம். தஞ்சை.
- சரசுவதி வேணு கோபால். (2010). நாட்டுப்புறப் பாடல்கள் சமூக ஒப்பாய்வு. மதுரை காமராசர் பல்கலைக்கழகம். மதுரை.
- பெருமாள், ஏ.என். (2011). தமிழக நாட்டுப்புறக் கலைகள். உலகத் தமிழாராய்ச்சி நிறுவனம். சென்னை.

திட்டக்கட்டுரை

UTAP501

பருவம் : நான்கு&ஐந்தாம் பருவம்
பிரிவு : முதன்மைப்பாடம் - XVI
வகுப்பு : III B.A. தமிழ்

தரம் : 04
மணிநேரம்/வாரம் : 02(IV) + 04(V)
மொத்த மணிநேரம் : 78

நோக்கம் : மாணவியர் மாணவிகளிடம் ஆய்வு பார்வையை அறிமுகப்படுத்துதல் .

குறிப்பிட்ட பொருண்மையைத் தெரிவு செய்து அப்பொருண்மைத் தொடர்பாக ஆசிரியர்களின் நெறிப்படுத்துதல் துணையோடு சுமார் ஐம்பது பக்க அளவில் திட்டக்கட்டுரையை உருவாக்குதல்.

வ.எண்	அக மதிப்பீடு		புற மதிப்பீடு	
	ஒப்படைவுகள்	**மதிப்பெண்கள்**	**ஒப்படைவுகள்**	**மதிப்பெண்கள்**
1	இலக்கியத்திறன்	*10*	ஆய்வறிகை	10
2	துறைச்சார்ந்த பார்வை	*10*	ஆய்வு விவரிப்பு	20
3	ஆராய்ச்சி நெறிமுறைகள்	*10*	வாய்மொழித்தேர்வு	10
4	ஆய்வுச் சிக்கல்	*10*		
5	ஆய்வின் தீர்வு	*10*		
6	திட்டக்கட்டுரை உருவாக்கம்	*10*		
	மொத்தம்	*60*		*40*
	மொத்த மதிப்பெண்கள்	*100*		

அகமதிப்பீட்டிற்கான உட்கூறுகள்

பருவம்	பிரிவு	வகை	பாடக் குறியீடு	பாடத்தலைப்பு	IIIஉட்கூறுகள்	IV உட்கூறுகள்
V	III	முதன்மைப்பாடம்-XVII	UTAM505	இதழியல்	தகவல் சேகரித்தல்	இதழ் தயாரித்தல்
		முதன்மைப்பாடம்-XVIII	UTAM506	சமய இலக்கியம்	தகவல் அட்டவணை	தலவரலாறு சேகரித்தல்
		முதன்மைப்பாடம்-XIX	UTAM509	நம்பியகப் பொருள்	கருத்தரங்கம்	நூல் மதிப்பீடு
		முதன்மைப்பாடம் - XX	UTAM510	ஊடகத்தமிழ்	ஒப்படைப்புத்தாள	தகவல் சேகரித்தல்
		சார்பு விருப்பப் பாடம்-I	UCSA505	தமிழ்க்கணினி	ஒப்படைப்புத்தாள்	தகவல் சேகரித்தல்
VI	III	முதன்மைப்பாடம் - XX	UTAM603	இலக்கியத் திறனாய்வியல்	ஒப்படைப்புத்தாள்	நூல் திறனாய்வு
		முதன்மைப்பாடம் - XXI	UTAM604	சொற்பொழிவுக்கலை	கருத்தரங்கம்	மேடைப்பேச்சு
		முதன்மைப்பாடம்-XXIII	UTAM607	தண்டியலங்காரம்	ஒப்படைப்புத்தாள்	வினாடி வினா
		முதன்மைப்பாடம்-XXIV	UTAM609	சங்க இலக்கியம்	கருத்தங்கம்	நூல் மதிப்பீடு
		துறை சார் விருப்பாடம்	UTAO601	நாட்டுப்புறவியல்	ஒப்படைப்புத்தாள்	நூல் மதிப்பீடு
			UTAR601	பயிற்சி பட்டறை - III	1. குரல் வளம் 2. குரலில் ஏற்ற இறக்கம் 3. கருத்தை வெளிப்படுத்தும் திறன் 4. மொழிநடை 5. அவையறிதல் 6. உச்சரிப்பு 7. பல்துறை தெளிவு 8. சந்தங்கள் 9. தாலாட்டுப் பாடல்கள் 10.மௌன அரங்கம்	

பயிற்சி பட்டறை - III - மதிப்பெண் வழங்கும் முறை	
CIA	**60 மதிப்பெண்**
தொடர் மதிப்பீடு (DPA)	30 மதிப்பெண்
செய்முறைத் தேர்வு – I	10 மதிப்பெண்
புறவாய்மொழித் தேர்வு - I	05 மதிப்பெண்
செய்முறைத் தேர்வு - II	10 மதிப்பெண்
புறவாய்மொழித் தேர்வு – II	05 மதிப்பெண்
பருவத்தேர்வு (ESE)	**40 மதிப்பெண்**
பதிவேடு	10 மதிப்பெண்
செய்முறைத் தேர்வு	20 மதிப்பெண்
புறவாய்மொழித் தேர்வு – II	10 மதிப்பெண்

பாடத்திட்ட அமைப்பு : ஆய்வியல் நிறைஞர் (M.Phil)

மணிநேரம் மற்றும் மதிப்புக்களை ஒதுக்குதல்

(2020 - 2021 கல்வியாண்டு முதல் நடைமுறை படுத்தப்பட்டது)

பருவம்	தாள் எண்	தாள் குறியீடு	பாடம்	மணி நேரம்	தரம்
முதல் பருவம்	தாள் 1	MTAM101	ஆராய்ச்சி நெறிமுறைகள்	6	5
	தாள் 2	MTAM103	தமிழ் ஆராய்ச்சி வரலாறு	6	5
	தாள் 3	MTAM104	பின்புலத்தாள்	-	5
	தாள் 4	**MRPE101**	ஆய்வுக்கட்டுரைகள் வெளியீட்டு நெறிமுறைகள்	-	2
இரண்டாம் பருவம்	தாள் 5	MTAMP201	ஆய்வேடு	-	13
				மொத்தம்	30

கருத்தரங்களில் ஆய்வுக்கட்டுரைகள் வெளியிடுதல் (குறைந்தபட்சம் ஒன்று) (அல்லது) இதழ்களில் ஆய்வுக் கட்டுரைகள் இடம்பெற செய்தல் (குறைந்தபட்சம் ஒன்று) கட்டாயமாகும்.

DEPARTMENT OF ENGLISH

PREAMBLE

UG : Programme profile and the syllabi of courses offered in semester V and VI along with III and IV evaluation Components (with effect from 2018-2021 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.
- Analyse the socio-political aspects in literary texts.
- Compare the cultural context in different literature and analyse the literary text.
- Pronounce with perfect stress, intonation, and transcribe the sounds of English language.

Semester	Part	Category	Course Code	Course Title	Previous Course Code	Contact Hrs/Week	Credit
							Min/Max
I	I	Language	UTAL105/ UTAL106/ UHIL102/ UFRL102	Basic Tamil I Advanced Tamil I Hindi I/ French I	UTAL103/ UTAL104	4	2/3
	II	English	UENL107 / UENL108	General English I / Advanced English I	UENL106	5	¾
	III	Core I	UENM105	Foundation Course to English		2	1
	III	Core II	UENM108	Poetry	UENM106	6	5
	III	Core III	UENM109	Prose	UENM107	6	5
	III	Allied I	UENA103	Literary Terms and Forms	UENA301, UENA102	5	5
	IV	Value Education				2	1
TOTAL						**30**	**22/24**
II	I	Language	UTAL205/ UTAL206/ UHIL202/ UFRL202	Basic Tamil II Advanced Tamil II Hindi II/ French II	UTAL203/ UTAL204	4	2/3
	II	English	UENL207 / UENL208	General English II / Advanced English II	UENL 206	5	¾
	III	Core IV	UENM207	Drama	UENM205	5	5
	III	Core V	UENM208	Fiction	UENM206	5	5
	III	Allied II	UENA203	Social History of England	UENA401	5	5
	IV	Non-Major Elective				4	2
	IV	Soft Skills				2	1
	V	Extension Activity/ Physical Education/				-	½

		NCC					
					TOTAL	**30**	**24/27**
III	I	Language	UTAL305/ UTAL306/ UHIL 302/ UFRL302	Basic Tamil III Advanced Tamil III / Hindi III / French III	UTAL303/ UTAL304	4	2/3
	II	English	UENL307 / UENL308	General English III / Advanced English III	UENL 306	5	¾
	III	Core VI	UENM305	Indian Writing in English	UENM401, UENM403	5	5
	III	Core VII	UENM306	American Literature	UENM502, UENM506	5	5
	III	Allied III	UENA303	History of English Literature – I	UENA101, UENA202	6	5
	IV	Online Course		Online Course (NPTEL/ Spoken Tutorial)		3	½
	IV	Value Education				2	1
					TOTAL	**30**	**22/25**
IV	I	Language	UTAL405/ UTAL406/ UHIL 402/ UFRL402	Basic Tamil IV / Advanced Tamil IV / Hindi IV/ French IV	UTAL403/ UTAL404	4	2/3
	II	English	UENL407 / UENL408	General English IV Advanced English IV	UENL 406	5	¾
	III	Core VIII	UENM405	Diasporic Literature	UENM504	6	5
	III	Core IX	UENM407	Language and Linguistics	UENM501, UENM505	5	5
	III	Allied IV	UENA403	History of English Literature – II	UENA201, UENA302	6	5
	III	Core XIII	UENM513/ UENP501	Basics of Translation / Project	UENO501, UENO511	2	-
	IV	Soft Skills				2	1
	V	Extension Activity / Physical Education / NCC				-	-/2
					TOTAL	**30**	**21/25**
V	III	Core X	UENM509	English Language Teaching	UENM603, UENM607	6	5
	III	Core XI	UENM512	Literary Criticism- I	UENM503, UENM507	6	6
	III	Core XII	UENP501/ UENM513	Project/ Basics of Translation		4	3
	III	Core XIII	UENM514	Postcolonial Literature	UENM402, UENM404	6	4
	III	Core XIV	UENM515	Commonwealth Literature	UENM510	6	5
	IV	Value Education				2	1
TOTAL						**30**	**24/24**
	III	Core XV	UENM609	English Phonetics	UENM602,	6	5

VI					UENM606		
	III	Core XVI	UENM611	Literary Criticism- II	UENM604, UENM608	6	6
	III	Core XVII	UENM612	Shakespeare	UENM508	6	5
	III	Core XVIII	UENM613	Twentieth Century Literature	UENM302, UENM304, UENM610	5	5
	III	Core XIX	UENC602	Comprehensive Viva Voce	UENC601	-	1
	III	Major Elective	UENO603	Journalism	UENO502	5	4
			UENO604	Mass Communication			
	IV	Soft Skills				2	1
	V	Extension Activity/ Physical Education/ NCC				-	2
					TOTAL	**30**	**27/29**
					GRAND TOTAL	**180**	**140/154**

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	UENS501	Practice of Translation (Self – Study)	26	1
VI	III	Core	UENP601	Mini-Project	26	1

EXPERIENTIAL LEARNING (MANDATORY)

Semester	Category	Course Code	Course Title	Collaborating Agency	Hours/Days /Month	Mode of Evaluation	Credits Max/Min
IV	Core X	UENM509	English Language Teaching	MSME	2 Days	Reflection	1

ENGLISH LANGUAGE TEACHING
UENM509

Semester	**: V**	**Credits**	**: 5**
Category	**: Core X**	**Hours**	**: 6**
Class & Major	**: III UG**	**Total Hours**	**: 78**

Objectives:

To enable the students

- Understand English language teaching skills.
- Adapt the new technologies for the teaching and learning process.
- Appraise the new theories and methods in English language teaching.

Learning Outcome:

On Completion of the course, the students will be able to

- Comprehend the methods and concepts related to the language learning.
- Attain and enhance competence in the four modes of literacy: LSRW
- Master the theoretical concepts of language and techniques of communicating oral and written English for specific purpose in general and academic context.

UNIT– I INTRODUCTION **15 Hrs**

A brief history of English Language teaching-English Language Teaching in India

UNIT – II THEORIES, APPROACHES AND METHODS OF TEACHINGENGLISH **15Hrs**

Language Acquisition theories -Approaches-Methods and Techniques in ELT Current trends in ELT.

UNIT – III TEACHINGLANGUAGESKILLS **16 Hrs**

Teaching of Language Skills- Teaching Vocabulary, Teaching Learning, Speaking, Reading and Writing.

UNIT – IV TECHNOLOGY ENABLEDLANGUAGETEACHING **16 Hrs**

SMS Language, Virtual Classroom, Reflective Classroom, Flip classes, Blend teaching, E-learning.

UNIT – VDIGITAL TEACHING **16 Hrs**

Integrating technology into secondary English language teaching, Technology Integrated English for Specific Purposes, English for Academic Purposes.

Text Books

- Bose, M.N.K. (2010).*A Text Book of English Language Teaching (ELT) for Indian Students*. New Century Book House Pvt. Ltd. Chennai.
- George Yule. (2010). *Study of Language.* Cambridge University Press. Cambridge.

Reference Books

- Meenakshi Sundaram. (2011). *Teaching of English*. Kavyamala. Chennai.
- Richards and Rodgers. (2010).*Approaches and Methods in Language Teaching.* CUP Cambridge.
- Gary Motteram. (2013).Innovations in Learning Technologies in Language Teaching. British Council. London.

LITERARY CRITICISM – I

UENM512

Semester	**: V**	**Credits**	**: 6**
Category	**: Core XI**	**Hours/Week**	**: 6**
Class &Major	**: III BA 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 Outcome:

On Completion of the course, the students will be able to

- Understand and to criticize a literary piece.
- Use the knowledge of key forms and terminology of literary criticism.
- Criticize individual works meaningfully and present it.

UNIT-II NTRODUCTION **14 Hrs**

Nature and Definition of Criticism, Functions of Criticism, Classical and Romantic Criticism - Qualifications of a critic.

UNIT – II CLASSICAL CRITICISM **16 Hrs**

Aristotle (384-322BC) : Poetics

UNIT – III RENAISSANCECRITICISM **16 Hrs**

Sir Philip Sidney (1554-1586) : Apologie for Poetry

UNIT – IV NEO-CLASSICALCRITICISM **16 Hrs**

John Dryden (1631-1700) : An Essay of Dramatic Poesy

UNIT- V ROMANTIC CRITICISM **16 Hrs**

William Wordsworth (1770-1850) : Preface to Lyrical Ballads

Text Book

- HabibRafey. (2011). *Literary Criticism from Plato to the Present: An Introduction*. Chichester West Sussex Wiley-Blackwell. U.K.

Reference Books

- Patricia Waugh. (2014). *Literary Theory and Criticism an Oxford Guide***.** Oxford UP. Chennai.
- Malik, R.S.(2014). *A New Approach to Literary Theory and Criticism*. Atlantic. Chennai.
- Peter Barry. (2010).*Beginning Theory: An Introduction to Literary and Cultural Theory.* Viva Books. Chennai.
- Vijay Kumar Das. (2010).*Twentieth Century Literary Criticism.* Atlantic. (6th ed.,). India.
- Prasad. (2014). *A Background to the Study of English Literature*. Trinity Press. New Delhi.

PROJECT
UENP 501

Semester : IV & V	**Credits : 3**
Category : Core XII	**Hours/Week : 2+4**
Class &Major: II B.A. English & III B.A. English	**Total Hours : 26+52**

Objectives:

To enable the students

- Select research problem and prepare research proposal.
- Understand the methods and mechanics of Research Report Writing.
- Prepare the academic research report.

Learning Outcome:

On Completion of the course, the students will be able to

- Demonstrate knowledge of research processes (reading, evaluating, and developing)
- Identify, explain, compare, and prepare the key elements of a research proposal and report
- Formulate a research problem in terms of Research Question, Objectives and hypotheses and design a step-by-step approach to handle the further.

UNIT- I INTRODUCTION **6 Hrs**

Introduction to project writing – Research writing and Academic Writing

UNIT- II NEED FOR RESEARCH **5 Hrs**

Selecting a Topic - Preparing a Thesis Statement - Language and Style – Plagiarism.

UNIT- III MATERIAL COLLECTION **5 Hrs**

Sources of Information – Primary Source and Secondary Sources

UNIT- IV DOCUMENTATION **6 Hrs**

Text of a thesis: Introduction – Body of a thesis– Summation – Work cited or consulted – Format of the Research paper

UNIT- V WORKING BIBLIOGRAPHY **4 Hrs**

Preparation of a Working Bibliography

Text Book

- Joseph Gibaldi. (2009). MLA Handbook for Writers Research Papers. Affiliated East West Press Pvt. Ltd. (7th ed.,). New Delhi

Reference Book

- Janathan Anderson. (2010).Thesis and Assignment Writing. Wiley Eastern Ltd. New York.

Note:

- ESE Project submission will be conducted during V Semester.
- 4 Hours will be utilized for research writing.

E - Resources

- "Literature Reviews: An Overview for Graduate Students." *YouTube*, youtube/t2d7y_r65HU.
- http://www.writing.utoronto.ca/advice/specific-types-of-writing/literature-review
- https://youtu.be/gDY4ZHyo5iw

Note:

- Two hours per week will be taken during IV semester and remaining four hours per week will be utilized for project during 5th semester.
- Project should submit in end of the 5th semester.

PROJECT

UENP501

Evaluation Components

CATEGORY	CIA MARKS	END SEMESTER MARKS
Research Proposal	20	-
Collection of Data/ Experimentation	20	-
Analysis of Data/Experimentation result	20	-
Project Report	-	30
Viva Voce	-	10
Total(100)	**60**	**40**

GUIDELINES FOR PROJECT

- Students are allowed to choose their project on the following areas: British Literature, American Literature and Indian Literature.
- It is mandatory that the project should be of single author's work in the concerned areas.
- The project should contain not less than 20 pages and not more than 40 pages.

BASICS OF TRANSLATION

UENM513

Semester : IV & V **Credits : 3**
Category : Core XII **Hours/Week : 2+4**
Class &Major : II B.A. English & III B.A. English **Total Hours : 26+52**

Objectives:

To enable the students

- Understand the origin and development of translation.
- Acquire knowledge on various theories and techniques of translation.
- Enhance the conceptual and practical dimensions in Translation.

Learning Outcome:

On Completion of the course, the students will be able to

- Translate with the basic knowledge of translation theories.
- Create contrastive knowledge and critical thinking skills
- Develop self-assessing and self-correcting techniques in order to monitor their own progress.

UNIT- I INTRODUCTION **14 Hrs**

Origin and development of Translation – Types of Translation- History of Bible Translation.

UNIT- II THEORIES OF TRANSLATION **12 Hrs**

Theodore Savory- C.J Catford -Eugene Nida**.**

UNIT- III SOURCE LANGUAGE TO TARGET LANGUAGE **18 Hrs**

Problems and Techniques - Decoding and Recoding- Problems and Equivalence.

UNIT- IV TRANSLATION IN DIFFERENT GENRE **18 Hrs**

Translation of poetry, Prose, Translating Dramatic Texts.

UNIT– V PERFORMANCE AND ASSESMENT **16 Hrs**

Prose, Poetry, Fiction, Short Story and Drama- Student can choose any work from English Literature and to be translated from English to Tamil.

Text Book

- Susan Bassnett. (2014). *Translation Studies.* Routledge Publication.UK.

Reference Books

- Jeremy Munday.(2012) *Introduction to Translation Studies: Theories and Application*. Routlege Publication.UK.
- Catford, J.C.(2010). *Linguistic Theory of Translation.* Oxford University Press.UK.
- Savoury Theodore. (2011).*The Art of Translation.* John Benjamins Publishing Company. Netherlands.
- Ramanujan A.K. (2010). *The Interior Landscape: Love Poems from a Classical Tamil Anthology*. Oxford University Press. UK.

E - Resources

- https://www.youtube.com/watch?v=q4ytZjrlgts
- https://www.youtube.com/watch?v=EfjwKPIx480
- https://www.youtube.com/watch?v=BCvQw3gKJOU

Note:

- For CIA I (Unit I & II) , Component III will be conducted in the IV semester
- CIA II, Component IV (from Unit III & IV) and End semester exam will be conducted in the V Semester (Unit I - V).

POSTCOLONIAL LITERATURE

UENM514

Semester	**: V**	**Credits**	**: 4**
Category	**: Core XIII**	**Hours/week**	**: 6**
Class &Major	**: IIIBAEnglish**	**Total Hours**	**: 78**

Objectives:

To enable the students

- Identify key questions, authors, and literary forms in Postcolonial literature.
- Analyse the texts in relation to Postcolonial theory.
- Critically evaluate arguments and assumptions about Postcolonial literature, texts, and modes of interpretation.

Learning Outcomes:

On Completion of the course, the students will be able to

- Understand multicultural aspects in Postcolonial Era.
- Analyse the texts in relation to Postcolonial theory with cultural contexts and use the theory in research.
- Develop interpretative skills through close reading.

Introduction to Postcolonial Literature

UNIT - I POETRY **15 Hrs**

Mamang Dai	**:**	The Voice of the Mountain
Margaret Atwood	**:**	In the Secular Night
Judith Wright	**:**	Clock and Heart
Wole Soyinka	**:**	Telephonic Conversation
Kishwar Naheed	**:**	I am Not that Woman

UNIT – II PROSE **16 Hrs**

Edward Said	**:**	'Crisis' from Orientalism
Jean Paul Sartre	**:**	Preface to Wretched of the Earth.

UNIT – II ISHORTSTORIES **16Hrs**

Rudy Wiebe	**:**	Where is the Voice Coming From?
Henry Lawson	**:**	The Drover's Wife

UNIT – IV DRAMA **15Hrs**

Aimé Césaire	**:**	A Tempest

UNIT – V NOVEL **16Hrs**

Chinua Achebe	**:** Things Fall Apart
Salman Rushdie	**:** Midnight's Children

Text Books

- Ato Quayson. (2012).*The Cambridge History of Postcolonial Literature*. Cambridge University Press. New York.
- EllekeBohemer. (2005).*Colonial and Postcolonial Literature*. Oxford University Press. New York.

Reference Books

- Ashcroft Bill Ashcroft. (2005).*The Post-Colonial Studies Reader*. Routledge Publication. New York.
- Brennan Timonthy. (2000). *Salman Rushdie and the Third World*. St.Martin's Press. New York.
- Killam, G. D. (2003).*The Novels of Chinua Achebe. Studies in African Literature Series*. Heinemann. London.
- Rushdie Salman. (2007).*Midnight's Children*. Vintage Books. New York.

E-Resources

- https://poemanalysis.com/i-am-not-that-woman-by-kishwar-naheed-poem-analysis/
- https://www.unibamberg.de/fileadmin/uni/fakultaeten/split_lehrstuehle/englische_literatur/Materialien/Houswitschka/Orient/Edward_Said_Crisis_in_Orientalism.pdf
- http://sittingbee.com/the-drovers-wife-henry-lawson/

COMMONWEALTH LITERATURE

UENM515

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

Objectives:

To enable the students

- Understand the life and culture of Commonwealth Literature.
- Introduce the students to the literary works of Commonwealth Writers.
- Acquire knowledge in the writings of colonized countries.

Learning Outcome:

On Completion of the course, the students will be able to

- Demonstrate the polarized context of the colonizer and the colonized.
- Dismantle the myths of European superiority in literature with the study of writers of colonized countries.
- Analyze and appreciate the cross cultural and multicultural aspects.

Introduction to Commonwealth Literature

UNIT – I POETRY **15 Hrs**

Sir Derek AltonWalcott	**:**	A Far Cry from Africa
Dom Moraes	**:**	A Letter
A K Ramanujam	**:**	A River
Arthur Nortje	**:**	Letter from Pretoria Central Prison
Toru Dutt	**:**	Lakshman

UNIT –II PROSE **15 Hrs**

Margaret Atwood	:	"Nature as a Monster" from Chapter 2 of Survival: A Thematic Guide to Canadian Literature.
Ngugi wa Thiong'o	:	Chapter 1 & 2 in The Language of African Literature from Decolonizing Mind

UNIT- III SHORTSTORY **16 Hrs**

Katherine Mansfield	:	Bliss
Chitra Banerjee Divakaruni	:	Clothes

UNIT-IV DRAMA **16 Hrs**

Wole Soyinka	:	The Lion and the Jewel

UNIT - VNOVEL **16 Hrs**

Jamaica Kincaid	:	Annie John
R.K. Narayan	:	Swami and Friends

Text Books

- Narasimhaiah, C.D.(2016).*An Anthology of Commonwealth Poetry.* Macmillian Indi Ltd. New Delhi.
- Margaret Atwood.(2013).*Survival: a Thematic Guide to Canadian Literature*. House of Anansi Press. Toronto.

Reference Books

- Mukherjee Meenakhsi. (2003).*Midnight's Children: A Book of Readings*. Pencraft. New Delhi.
- Trivedi, H. & Mukherjee, M. (2000). *Interrogating Post-Colonialism* (Theory, Text and Context). Institute of Advanced Study. Shimla.

E-Resources

- https://www.arcjournals.org/pdfs/ijsell/v2-i8/9.pdf
- https://www.youtube.com/watch?v=rTr7dybrVVc

PRACTICE OF TRANSLATION
UENS501

Semester	**: V**	**Credits**	**: 1**
Category	**: Core**	**Hours**	**: 2**
Class&Major	**: III UG**	**Total Hours**	**: 26**

Objectives:
To enable the students

- Understand the origin and development of translation.
- Identify the similarities between the source text and target text.
- Enhance the ability in translating at ext.

Learning Outcome:
On Completion of the course, the students will be able to

- Understand the basic concepts in translation process.
- Analyze the methods used to change source language into the target language.
- Adapt to translating skills form the source language into target language.

UNIT-I INTRODUCTION **6 Hrs**

Translation – Methods of Translation

UNIT - II POETRY **10 Hrs**

Salma - Yeri (Lake),
- Yarum Illatha Idathil (A Deserted Place),
- En PoorvigaVeedu 1 (My Ancestral House)

UNIT- III SHORTSTORY **10 Hrs**

Ambai – Vahanam (Tamil to English)
Pudhumaipithan –Kadavulum Kandasamy Pillaiyum

Text Book

- Susan Bassnett. (2014). *Translation Studies.* Routlege Publication.UK.

Reference Books

- Salma *Pachchai Devathai*. (2003). *Kalachuvadu Pathippagam*. Nagercoil Publications.
- Lakshmi, C.S. (2001). *Ambai.* Purple Sea. Madras.

ENGLISH PHONETICS

UENM609

Semester	**: VI**	**Credit**	**: 5**
Category	**: Core XV**	**Hours/Week**	**: 6**
Class &Major	**: III UG**	**Total Hours**	**: 65**

Objectives:

To enable students

- Understand the organs of speech and use it appropriately.
- Analyze the variations of consonant and vowel sounds.
- Examine the theory of English phonetics and practice it.

Learning Outcome:

On Completion of the course, the students will be able to

- Understand and use some basic phonetics terminology.
- Describe the consonants clusters of English syllable structure.
- Pronounce words and phrases with correct stress pattern.

UNIT-I INTRODUCTION **13 Hrs**

The organs of speech - Airstream mechanisms - Definition of phonetics and phoneme - Types of phonetics.

UNIT-II CONSONANTS **13 Hrs**

Definition of Consonants - Classification and Description of Consonants.

UNIT-III VOWELS **13 Hrs**

Definition - The cardinal vowel chart - Pure vowels – Diphthongs - Trip thongs

UNIT-IV PRONUNCIATION **13 Hrs**

Phonology - The Syllable - Accent and Rhythm in connected speech.

UNIT-V PRACTICAL **13 Hrs**

Consonant clusters in English – Intonation - Phonetic Transcription. Practical Test – Language Lab

Text Book

- Balasubramanian, T. (2013).*A Textbook of English Phonetics for Indian Students***.** Trinity Chennai.

Reference Books

- Grimson, A.C.(1982).*An Introduction to the Pronunciation of English***.** Macmillan. New Delhi.
- Kansakar Tej, R. (1998). *A Course in English Phonetics*. Orient Longman. India.
- Roach Peter. (1992). *Introducing Phonetics*. Penguin London.

LITERARY CRITICISM – II

UENM611

Semester : VI	**Credits : 6**
Category : Core XVI	**Hours/Week : 6**
Class &Major: III BA English	**Total Hours : 78**

Objectives:

To enable the students

- Understand the current trends in Literary Criticism.
- Apply the concepts of criticism in literary works.
- Classify the various literary theories and evaluate critically.

Learning Outcome:

On Completion of the course, the students will be able to

- Understand the literary concept and apply various critical approaches in the text.
- Analyze the literary text, trace the origin of different theoretical concepts and view the literary text in a different perspective.
- Frame new concepts and develop different techniques to analyse the literary text.

UNIT- I VICTORIAN CRITICISM **15 Hrs**

Mathew Arnold : Study of Poetry

UNIT-II NEW CRITICISM **16 Hrs**

T.S Eliot : Traditional and Individual Talent

UNIT- III ARCHETYPAL CRITICISM **15 Hrs**

Northrop Fyre : Archetypes of Literature

UNIT- IV READER RESPONSE THEORY **16 Hrs**

Roland Barthes : Death of the Author

UNIT – V POSTCOLONIAL THEORY **16 Hrs**

Edward Said : Crisis (in Orientalism)

Text Book

- Edward W.Said. (2014).*Orientalism*. Vintage Books, Massachusetts.

Reference Books

- Patricia Waugh. (2014). *Literary Theory and Criticism: an Guide***.** Oxford University Press. New Delhi.
- Malik, R.S. (2014). *A New Approach to Literary Theory and Criticism*. Atlantic. Chennai
- Peter Barry. (2010). *Beginning Theory: An Introduction to Literary and Cultural Theory.* Viva Books. Chennai.
- Leitch Vinct, B (2010). *The Norton Anthology of Theory and Criticism*. Norton& Co. New York.

SHAKESPEARE

UENM612

Semester	**: VI**	**Credits**	**: 5**
Category	**: Core XVII**	**Hours / Week**	**: 6**
Class &Major	**: III UG**	**Total Hours**	**: 65**

Objectives:

To enable the students

- Understand the dramatic and theatrical conventions of Shakespeare.
- Identify the traits of Shakespeare that made him the man of millennium.
- Examine the plays in modern context.

Learning Outcome:

On Completion of the course, the students will be able to

- Understand Shakespearean themes, forms, and genres.
- Recognize the concepts of Shakespeare's work in historical and social contexts
- Analyze words on multiple levels by drawing on etymology, historical usage, and distinct meanings.

UNIT-I INTRODUCTION **12 Hrs**

Elizabethan Theatre and Modern Theatre. Introduction to Shakespeare's sonnets and plays– Tragedy, Comedy, Historical Plays, Romantic Comedy and Tragic- Comedy.

UNIT – II SHAKESPEARIAN SONNETS **12 Hrs**

Sonnet No. 64, 94, 96, 114&124

UNIT– III TRAGEDY **14 Hrs**

King Lear

(Context, Source of the Play, Plot overview, Character list, Analysis of Major characters, Themes, Motifs, Symbols and Summary analysis)

UNIT- IV COMEDY **14 Hrs**

Much Ado About Nothing (Context, Source of the Play, Plot overview, Character list, Analysis of Major characters, Themes, Motifs, Symbols and Summary analysis)

UNIT - V TRAGIC-COMEDY AND ROMANTIC COMEDY **13 Hrs**

Merchant of Venice - The Two Gentlemen of Verona.

(Context, Source of the Play, Plot overview, Character list, Analysis of Major characters, Themes, Motifs, Symbols and Summary analysis)

Text Book

- William Shakespeare. (2014).*The Complete Works of William Shakespeare.* Wordsworth Edition Ltd. UK.

Reference Books

- John James Jacqueline Morle. (2010).*A Shakespearean Theatre*. Salariya Book Company. UK.
- Bradley, A.C. (2013). *Shakespearean Tragedy*. Atlantic Publishers Chennai.
- Eachern Mc Clare.(2013). *The Cambridge Companion to Shakespearian Tragedy.* Cambridge University Press. Cambridge.
- William Shakespeare. (2010). *Sonnets.* Random House. New York.

TWENTIETH CENTURY LITERATURE
UENM 613

Semester :VI **Credits : 5**
Category : Core XVIII **Hours/Week :5**
Class &Major :III BA English **Total Hours : 65**

Objectives:
To enable the students

- Understand different genres emerged in the Twentieth Century Literature.
- Describe the form, content and style in the Twentieth Century Literature.
- Analyse the literary work of modernism.

Learning Outcome:
On Completion of the course, the students will be able to

- Understand and become familiar with important themes and concepts of twentieth century literature in English.
- Acquire proficiency to classify different styles used by the writers.
- Analyse individual narrative, poetic and dramatic texts.

Introduction to Twentieth Century Literature

UNIT-I POETRY **13Hrs**

W.B. Yeats **:** The Second Coming
Sylvia Plath **:** Mirror
T.S. Eliot **:** Journey of the Magi
W.H. Auden **:** Musee Des Beaux Arts
Seamus Heaney **:** Digging

UNIT-II PROSE **13Hrs**

C.P. Snow **:** The Two Cultures
G.K. Chesterton **:** On Running after One's Hat

UNIT- III SHORT STORY **13Hrs**

Doris Lessing **:** Through the Tunnel Katherine
Mansfield **:** The Dolls House

UNIT- IV DRAMA **13Hrs**

Arnold Wesker **:** The Merchant

UNIT- V FICTION **13Hrs**

Daniel Quinn **:** Ishmael
James Joyce **:** A Portrait of the Artist as a Young Man

Text Books

- Simon Beesley. (2001). *History of 20th-century Literature*. Hamlyn. London.
- Michael Hulse. (2011). *The 20th Century in Poetry.* Ebury Press. London.

Reference Books

- Nagarajan, M.S. (2006).*Spectrum: An Anthology of Modern Prose*. Anu Chitra. Chennai.
- Wesker Arnold and Glenda Leeming. (2006).*The Merchant*. Methuen. London.
- Quinn Daniel. (2017). *Ishmael*. Bantam Books. New York.
- James Joyce. (2012).*A Portrait of the Artist as a Young Man.* Cambridge University Press. Cambridge.

E-Resources

- https://www.letras.cabaladada.org/letras/irony_principle_structure.pdf
- https://shorelineschools.instructure.com/courses/3233/assignments/12092

JOURNALISM

UENO603

Semester	**: VI**	**Credits**	**: 4**
Category	**: Major Elective**	**Hours**	**: 5**
Class &Major	**: III UG**	**Total Hours**	**: 65**

Objectives:

To enable the students

- Examine the various fields of Journalism.
- Develop the skills of writing for the field of Journalism.
- Write articles to be published in Journals and Magazines.

Learning Outcome:

On Completion of the course, the students will be able to

- Comprehend the importance of editorial and its choice of subjects, arrangement and style of presentation.
- Understand the role of the news editor and its functions, duties and responsibilities.
- Analyze the duties and qualities of Chief Editor and Sub editors.

UNIT-I INTRODUCTION **13 Hrs**

A Brief Introduction to Journalism- History and Evolution, Definition, Meaning and Scope. Functions of Journalism, Kinds of Journalism, and Principles of Journalism. British and American Style of Journalism - Role of the Press – Social Responsibility of the Press.

UNIT –II NEWS REPORTING **13 Hrs**

Principle and Ethics of Journalism. News - Elements of News - Types of News - Sources of News - Gathering News- News Agencies. The Reporter- Qualities of a good reporter - Types of reporting.

UNIT –III WRITING STYLE **13 Hrs**

Language and Style – Editorial Writing, Letters to the Editor, article and feature writing, the art of interviewing, Headlines, Crime reporting, Sports Reporting.

UNIT–IV NEWS EDITING **13 Hrs**

The News Editor, Editing- Role of an Editor - The Sub – editor - Role of a Sub - editor, His / her qualities - Basic Rules for Editing.

UNIT- V JOURNALIST WRITING FOR DIFFERENT MEDIA **13 Hrs**

Writing to Radio, TV, Film, Online Writing.

Text Books

- Das Ajay. (2010). *Journalism: Editing and Journalism.* Omega Publications. New Delhi.
- Das Ajay. (2010). *Print and Broadcast Journalism: A Critical Examination*. Omega Publications. New Delhi.

Reference Books

- Monita Singh. (2010).*Ethics and Codes in Modern Journalism.* Anmol Publications Pvt. Ltd.
- Saroj Mishra. (2014).*RTI and Modern Journalism*. Gyan Geeta Prakashan. India.
- Tripati, B.N. (2011). *Handbook of Journalism and Mass Media*. Saurabh Publishing House. New Delhi.
- Divyesh Raythatha. (2012).*Media Law & Journalism Ethics*. Pravin Prakashan Pvt. India.
- Wendy Wyatt, N. (2014).*The Ethics of Journalism: Individual, Institutional and Cultural Influences.* I .B. Tauris.

MASS COMMUNICATION

UENO604

Semester	**: VI**	**Credits**	**: 4**
Category	**: Major Elective**	**Hours**	**: 5**
Class &Major	**: III UG**	**Total Hours**	**: 65**

Objectives:

To enable the students

- Acquire knowledge of mass communication and its role in a media organization.
- Write reviews in online journals and newspaper.
- Appraise the historical growth of media, its auxiliary areas and the scope.

Learning Outcome:

On Completion of the course, the students will be able to

- Increase the knowledge and understand the mass communication process and mass media industries.
- Analyze the organizational and economic natures of contemporary media which reflect the dominant culture.
- Demonstrate skills and knowledge as consumers of media content.

UNIT- I COMMUNICATION: AN INTRODUCTION **13 Hrs**

Communication-Definition, Nature, Scope, Functions. The Communication Process - The Variable-Types of Communication- Intrapersonal, Interpersonal- Group and Mass Communication-Communication and Change-Communication and Society.

UNIT- II THEORIES OF COMMUNICATION **13 Hrs**

Theories of Communication.-Communication Models- Aristotle, Schramm, Berlo, Shannon and Weaver, Laswell, Dance -Theories on communication effect- Magic bullet / hypodermic needle, two-step, limited effect-Role of audience in communication.

UNIT- III DEVELOPMENT OF MEDIA **13 Hrs**

Growth and evolution of different media- Folk Media – Print – Radio – Television – Cinema - The different facets of mass media.

UNIT- IV FEATURES OF NEW MEDIA **13 Hrs**

New Media- meaning, definition and features. Web-based communication, Online Newspapers and Journals. Limitation and current trends. Future of the Web.

UNIT- V REVIEW WRITING **13 Hrs**

Feature of Story – News Writing –Column Writing - Book Review of different Genres – Radio, TV, Film Review and New Media Review.

Text Book

- Keval Kumar, J. (2011). *Mass Communication in India*. Jaico Publishing House. Bombay.

Reference Books

- J Stanley Baran,J and Dennis Davi, K. (2010). *Mass Communication and Man - Mass Communication Theory*. (4thed.,). Wadsworth USA.
- Mehta, D.S. (2012). Mass *Communication and Journalism in India*. Allied Publications. New Delhi.
- John Bittner, R. (2012).*Mass Communication- an Introduction*. Prentice Hall.USA.

III & IV EVALUATION COMPONENTS OF CIA

Semester	Category	Course Code	Course Title	Component III	Component IV
V	Core X	UENM509	English Language Teaching	Assignment	Seminar
	Core XI	UENM512	Literary Criticism- I	Paper Presentation	Poster Presentation
IV & V	Core XII	UENM513	Basics of Translation	Poem Translation	Translating speech of personalities
V	Core XIII	UENM514	Postcolonial Literature	Assignment	Seminar
	Core XIV	UENM515	Common wealth Literature	Paper Presentation	Seminar
VI	Core XV	UENM609	English Phonetics	Assignment	Transcription
	Core XVI	UENM611	Literary Criticism- II	Poster Presentation	Seminar
	Core XVII	UENM612	Shakespeare	Seminar	Report Writing
	Core XVIII	UENM613	Twentieth Century Literature	Assignment	Seminar
	Major Elective	UENO603	Journalism	Article Writing	Report Writing
	Major Elective	UENO604	Mass Communication	Report Writing	Poster Presentation

PROGRAMME PROFILE M.Phil ENGLISH

Semester	Category	Course Code	Course Title	Contact Hrs/week	Credit
I	CORE	MENM103	Research Methodology	6	5
	CORE	MENM104	Critical Approaches to Literature	6	5
	CORE	MENM105	Special Area Study	6	5
	CORE	MRPE101	Research and Publication Ethics	2	2
II	CORE	MEND202	Dissertation & Viva-Voce	30	13
TOTAL					**30**

- **Paper Presentation (Minimum one) and/ or Publication of articles in Journals (Minimum one) is mandatory for submission of Dissertation**

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 2018 – 2021 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.
- Innovated and developed skills to be a life-long learner for a globalized business for future.

Semester	Part	Category	Course Code	Course Title	Previous Course Code	Contact Hrs/ Week	Credit Min/Max
I	I	LANGUAGE-I	UTAL105/ UTAL106	Basic Tamil - I/Advanced Tamil – I/ French I /Hindi I	-	4	2/3
	II	ENGLISH-I	UENL107/ UENL108	General English I/Advanced English-I	-	5	¾
	III	Core I	UBAM105	Management Thoughts and Thinkers	-	2	1
		Core II	UBAM106	Business Organization	-	5	4
		Core III	UBAM108\ COM104\ UCCM102	Financial Accounting	-	6	5
		Allied – I	UCEA103	Business Economics	UCEA101	6	5
	IV	Value Education			-	2	1
					TOTAL	**30**	**21/23**
II	I	LANGUAGE-II	UTAL205/ UTAL206	Basic Tamil II/Advanced Tamil II/ French II /Hindi II	-	4	2/3
	II	ENGLISH-II	UENL207/ UENL208	General English II/Advanced English	-	5	¾
		Core IV	UBAM206	Business Environment	UBAM303	4	4
		Core V	UBAM207	Principles of Management	UBAM107 / UBAM102	5	5
		Core VI	UBAR201	Workshop on Decision Making	-	1	1
		Allied - II	UCOA203	Accounting Package Theory	-	2	2
		Allied Practical I	UCOR 203	Accounting Package Practical	-	3	2
	IV	Non Major Elective			-	4	2
		Soft skill			-	2	1
	V	Extension				-	1/2

		activity / Physical Education/NCC					
					TOTAL	**30**	**23/26**
III	III	Core VII	UBAM308	Marketing Management	UBAM402	5	4
		Core VIII	UBAM310/ UCOM305/ UCCM305	Cost Accounting	-	5	4
		Core IX	UBAM311	Business Communication	UBAM201 /UBAM204	4	3
		Core X	UBAM312	Creativity For Innovative Management	-	4	2
		Core XI	UBAM313	Organizational Behaviour	UBAM401, UBAM406	5	4
		Allied II	UMAA301	Business Statistics	UMAA303	5	4
	IV	Value Education				2	1
					TOTAL	**30**	**22**
IV	III	Core XII	UBAM405	Production & Materials Management	-	5	4
		Core XIII	UBAM408	Micro, Small And Medium Enterprises	UBAM406	6	5
		Core XIV	UBAM407	Human Resource Management	UBAM302	5	4
		Allied III	UMAA410	Quantitative Techniques In Business	UMAA505	5	4
		Allied IV	UCSA407	Cyber Security in Finance	-	3	3
		Allied Practical II	UCSR413	Cyber Security Lab	-	3	2
		CORE XV	UBAR401	Workshop On Creative Thinking Skill	-	1	1
	IV	Soft Skill			-	2	1
	V	Extension activity / Physical Education/NCC				-	0/2
					TOTAL	**30**	**24/26**
V	III	Core XVI	UBAM507	Research Methodology in Business	UBAM403	2	2
		Core XVII	UBAM508	Services Marketing	UBAM603	6	5
		Core XVIII	UBAM509	Mercantile Law	-	6	5
		Core XIX	UBAM504/ UCOM507/ UCCM507	Management Accounting	UBAM502	6	5
		Core XX	UBAM510	Business Informatics	-	5	5
	IV	Online Courses		NPTEL/Spoken Tutorial	-	3	1/2
	IV	Value Education				2	1
					TOTAL	**30**	**24/25**
	III	Core XXI	UBAM608	Strategic Management	-	5	5
		Core XXII	UBAM610/	Financial Management	-	6	5

VI			UCOM613/ UCCM613				
		Core XXIII	UBAM612	Business Analytics for Managers	-	5	5
		Core XXVI	UBAR601	Workshop On Leadership Skills	-	1	1
		Core XXV	UBAP601	Project	-	6	5
		Viva-Voce	UBAM611	Comprehensive Viva	-	-	1
		Major Elective	UBAO609	Consumer Affairs	-	5	4
			UBAM309/ UBAO610	Financial Markets and Services			
			UBAO604	Customer Relationship Management			
			UBAO605	Retail Management			
			UBAO606	Emerging Business Practices In India			
			UBAO607	Industrial Relations			
			UBAO608	Rural Marketing			
	IV	Soft Skill			-	2	1
	V	Extension activity / Physical Education/NCC				-	0/2
					TOTAL	**30**	**26/28**
					GRAND TOTAL	**180**	**140/150**

NON MAJOR ELECTIVES

Semester	Part	Category	Course Code	Course Title	Contact Hrs/Week	Credit Min/ Max
II	IV	Non Major Elective –I	UBAE202	Leadership Skills	4	2
III	IV	Non Major Elective-II	UBAE304	Rural Management	4	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

EXPERIENTIAL LEARNING (MANDATORY)

Semester	Category	Course code	Course Title	Contact/ Week	Credit Min/ Max
III	CORE-XXVI	UBAS201	Office Management	2	1
IV	CORE-XXVII	UBAS401	Travel and Tourism Management	2	1
V	CORE-XXVIII	UBAS501	Business Ethics	2	1
VI	CORE- XXIX	UBAS502	Corporate Social Responsibility	2	1

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

Course Mapping				Collaborating Agency - MSME		
Semester	**Course Code**	**Course Title**	**Assessment**	**Course Title**	**Hours/ Days/Month**	**Mode of Evaluation**
III	UBAM308	Marketing Management	Component IV	Social Media Marketing Training	2 Days	Reflection
V	UBAM510	Business Informatics	Component III	Data Analytics Certification	4 Days	Reflection
VI	UBAM612	Business Analytics for Managers	Component IV	Business Analytics Certification	4 Days	Reflection

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

RESEARCH METHODOLOGY IN BUSINESS

UBAM507

Semester : V **Credits : 02**
Category : Core XIV **Hours/Week : 02**
Class &Major: III BBA **Total Hours : 26**

Objectives:

To enable the students

- Understand the role of research in business.
- Formulate research problem and use different methods of sampling and tools
- To write research report.

Learning Outcome:

On Completion of the course, the students will be able to

- Develop understanding on various kinds of research, objectives, process, designs and sampling Research.
- Have basic knowledge on qualitative research techniques
- Have adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis

UNIT-I INTRODUCTION **5 Hrs**

Definition - Types- Role of research in business studies - Research problem identification-selection -Formulation of research problem - Research design.

UNIT-II FORMULATION OF RESEARCH PROBLEM AND DESIGN **4 Hrs**

Research methods - Case study, Survey, Experimental study - Relative advantages. Sampling Methods- Methods of Data Collection - Observation - Questionnaire-Interview Schedule.

UNIT -III RESEARCH METHODS **5 Hrs**

Measurement techniques - Scaling - Meaning – Classification - Techniques. Data collection; Meaning- Methods- Primary and secondary methods.

UNIT - IV ANALYSIS AND INTERPRETATION **6 Hrs**

Hypothesis – Meaning – Types – characteristics – Formulation – Sources – Testing of hypothesis - Tools

UNIT -V WRITING RESEARCH REPORT **6 Hrs**

Preliminary steps of writing research report- Essentials of a good report- Style of writing reports tables, figures - Format of the report

Note: Only Theory No Problems.

Text Books

- Ravilochanan, P. (2018), *Research Methodology.* Margham Himalaya Publications New Delhi.
- Wiliam G. Zikmund (2017).*Business Research Methods.* South-Western Cengage Learning.

Reference Books

- Donal Copper, R. (2017).*Business Research Methods*. Tata McGraw Hill. New Delhi.

- Kothari, C.R. (2018).*Research Methodology*.Wishva Prakashan.New Age International Publisher. Bangalore.
- Gopal, M H. (2018). An *Introduction to Research Procedure in Social Sciences.*

E- Resources

- https://www.library.cornell.edu/research/introduction
- www.tru.ca › Open Learning
- www.skillsyouneed.com/learn/research-methods.html

SERVICES MARKETING

UBAM508

Semester : V **Credit : 05**
Category : Core XV **Hours/Week : 06**
Class &Major: III BBA **Total Hours : 78**

Objectives:

To enable the students

- Understand the various concepts of services marketing.
- Use elements of marketing mix in services marketing.
- Implement the strategies for better services.

Learning Outcome:

On Completion of the course, the students will be able to

- Examine the nature of services, and distinguish between products and services.
- Develop an understanding of the roles of Relationship Marketing and customer service in adding value to the customer's perception of a service.

UNIT-I INTRODUCTION **16Hrs**

Definition – Service Economy – Evolution and growth of service sector – Nature and Scope of Services – Unique characteristics of services - Challenges and issues in Services Marketing.

UNIT- II SERVICES MARKETING OPPORTUNITIES **16 Hrs**

Assessing service market potential - Classification of services – Expanded marketing mix – Service marketing – Environment and trends – Service market segmentation, targeting and positioning.

UNIT- III SERVICES DESIGN AND DEVELOPMENT **15 Hrs**

Service Life Cycle – New service development – Service Blue Printing – GAP‟s model of service quality – Measuring service quality – SERV-QUAL – Service Quality function development.

UNIT-IV SERVICES DELIVERY AND PROMOTION **16Hrs**

Positioning of services – Designing service delivery System, Service Channel – Pricing of Services, methods – Service marketing triangle - Integrated Service marketing communication.

UNIT-V SERVICES STRATEGIES **15 Hrs**

Service Marketing Strategies for health – Hospitality – Tourism – Financial – Logistics - Educational – Entertainment & public utility Information technique Services – Case studies

Text Books

- Balaji, B. (2011).*Services Marketing & Management*, S.Chand Publication. New Delhi.
- Alan Wilson, Valarie A. Zeithaml and Mary Jo Bitner. (2014).*Service Marketing*. McGraw-Hill Education. New Delhi.

Reference Books

- Hoffman. (2018).*Marketing of Services*.Cengage Learning.
- Zeithaml Parusuraman. (2015). *Delivering Quality services*. The free press Macmillian.
- Philip Kotler. (2017).*Marketing of Non Profit Organization.* Prentice Hall of India (P) Ltd, India. New Delhi.
- Chiristropher H.Lovelock and JochenWirtz, Services Marketing, Pearson Education. New Delhi.2018.

E- Resources

- www.managementstudyguide.com/definition-and-characteristics-of-servi
- www.businessdictionary.com/definition/service-marketing.html
- www.slideshare.net/ch_paki/services-marketing

.

MERCANTILE LAW

UBAM509

Semester : V **Credit : 05**
Category : Core XVI **Hours/Week : 06**
Class &Major : III BBA **Total Hours : 78**

Objectives:

To enable the students

- Understand the basic concepts of Indian Contract Act, 1872.
- Analyse the various methods of discharge of contract and their remedies.
- Appraise the recent amendments in laws related to business.

Learning Outcome:

On Completion of the course, the students will be able to

- Demonstrate an understanding of the Legal Environment of Business.
- Apply basic legal knowledge to business transactions.
- Communicate effectively using standard business and legal terminology.

UNIT-I INTRODUCTION **15 Hrs**

Indian contract Act, 1872 - Scope - Characteristics - Kinds - Essential of contract - Classification of contract – Offers & Acceptance– Lapse & Revocation of offer.

UNIT-II ESSENTIALS OF CONTRACT **15 Hrs**

Consideration & Capacity – Coercion – Undue Influence – Fraud – Fraudulent - Silence – Mistake – Misrepresentation.

UNIT-III DISCHARGE OF CONTRACT **16 Hrs**

Discharge of contract by performance – Tender – Time and place for performance – Breach of contract – Actual Breach – Anticipatory Breach – Remedies for Breach – Damage and its Kinds – Rules for Damages.

UNIT-IV SALE OF GOODS ACT, 1930 & VAT **16 Hrs**

Sale of goods - Difference between sale and agreement to sell - Conditions and warranties - Transfer of property - Performance of contract of sale - Rights of unpaid seller, Meaning – objectives – advantages – disadvantages of VAT – tax credit system – set off of tax credit – levy of VAT.

UNIT-V THE PARTNERSHIP ACT 1932 **16 Hrs**

Registration of Partnership firms- Partners- Types- Rights, Duties and Liabilities – Implied Authority - Expulsion – Insolvency- Death-Transfer of Interest- Position of Minor as Partner-Dissolution of partnership.

Text Book

- Kapoor, N.D. (2015).*Mercantile Law.* Sultan Chand & Sons Publications. New Delhi.

Reference Books

- Moshal, B.S. (2014).*Mercantile Law.* Ane Books Private Ltd.Mumbai.
- Gulson, S.S. (2015). Mercantile *Law. 5th Edition.*Bangalore.
- Padma, T &K.P.C.Rao. (2014).*Mercantile laws, Sultan Chand & Sons. New Delhi.*

E-Resources

- Cacmacsclub.com/cpt-mercantile-law-notes-study-material/html.
- https://superprofs.com/ca/how-to-prepare-ca-cpt-mercantile-law/
- www.sheir.org/mercantile_law_notes.html

MANAGEMENT ACCOUNTING

UBAM504/UCOM507/UCCM507

Semester	**: VI**	**Credit**	**: 05**
Category	**: Core XIV / XIII**	**Hours/Week**	**: 06**
Class/Major	**: III BBA/IIIB.Com/III B.Com (CA)**	**Total hours**	**: 78**

Objectives:

To enable the students

- Gain knowledge of basic concepts of Management Accounting
- Analyze and interpret the financial statements
- Develop accounting skills to take managerial decisions

Learning Outcome:

On Completion of the course, the students will be able to

- Make calculations with whole numbers of varying magnitude
- Identify different types of fractions and convert between them
- Use multiplication and division when evaluating expressions with decimals.

UNIT-I INTRODUCTION TO MANAGEMENT ACCOUNTING **15 Hrs**

Management Accounting – Meaning, scope, importance and limitations – Management Accounting vs. Cost Accounting – Management Accounting vs Financial Accounting.

UNIT- II ANALYSIS AND INTREPRETATION OF FINANCIALSTATEMENT **16 Hrs**

Financial statement – Nature, objectives and tools– Methods– Comparative Statements , Common Size statement – Trend Analysis.

UNIT- III RATIO ANALYSIS **16 Hrs**

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

UNIT- IV FUND FLOW& CASH FLOW ANALYSIS **15 Hrs**

Fund Flow and Cash Flow Statement – Differences – Advantages – Limitations- Conversion method only.

UNIT-V BUDGETARY CONTROL AND MARGINAL COSTING **16 Hrs**

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.(2017). *Management Accounting.* Sterling Publishers Ltd. New Delhi.
- Reddy & Murthy. (2018). *Management Accounting*. Margham Publications. New Delhi.
- Maheswari,S.N. (2017). *Cost and Management Accounts.* Sultan Chand & Sons.Mumbai.

Reference Books

- Jain and Narang, (2016). *Cost and Management Accounts*. Kalyani Publications.
- Pillai.R.S.N & Bhagirathi.,(2016). *Management Accounting.* S.Chand & Co. Ltd.
- Khan.P.K (2016). *Jain Management Accounting Publisher*. Tata McGraw-Hill Education.

E- Resources

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

BUSINESS INFORMATICS

UBAM510

Semester : V **Credit : 5**
Category : Core XX **Hours/Week: 5**
Class &Major: III BBA **Total Hours: 65**

Objectives:

To enable the Students

- Understand the basics of Computer
- Design the basics of networking
- Use the simple SQL Commands in different fields

Learning Outcome:

On Completion of the course, the students will be able to

- Demonstrate knowledge and skills in the logical foundations of informatics, data representation, models, structures and informatics-centric management.

UNIT-I INTRODUCTION TO COMPUTERS **13 Hrs**

Introduction - Characteristics of Computers - Block diagram of computer - Booting Process - Types of Programming Languages - Data Organization- Storage Devices- I/O Devices- Number Systems.2

UNIT – II OPERATING SYSTEM AND SERVICES IN O.S **13 Hrs**

Definition of operating system- Services provided by OS- Types of O.S - Features of Windows and Linux- Files and Directories-Internal and External Commands of DOS- Batch Files, SPSS tools, ERP, MIS.

UNIT-III DATA AND INFORMATION **12 Hrs**

Introduction- Data and Information - Measuring data - Information as a resource, Information in organizational functions - Types of information technology - Types of information systems - Transaction processing systems - Management Information Systems.

UNIT-IV INTRODUCTION TO NETWORKING **14 Hrs**

Basics of Computer Networks – Definition – Goals – Applications – Components – Topology - Types of Networks - Modes of Communication - Transmission media - Protocols and purpose - Network Connectivity Devices - Internet Basics - Concept of Internet, Intranet and Extranet - Search Engine - Internet Service Providers(ISP).

UNIT-V INTRODUCTION TO R.D.B.M.S **13Hrs**

Advantages and Limitations – Normalization - Entity Relationships - Use of simple SQL Commands involving both single table and joins.

Text Books

- Singh, P. (2018). *Computer Fundamentals*. Vikas Global Publications.
- Ram, B. (2015) *Computer Fundamentals Revised Third Edition* New Age International Publications.

Reference Books

- Computer Applications in Management- By Niranjan Shrivastava (Dreamtech Press)
- Data Communications & Networking- Behrouz Ferouzan (3rd Edition)

E-Resource

- https://www.informaticsglobal.com › information-products

STRATEGIC MANAGEMENT

UBAM608

Semester : VI **Credits : 05**
Category : Core XVII **Hours/week : 05**
Class &Major : III BBA **Total Hours : 65**

Objectives:

To enable the students

- Understand the concept of corporate strategy
- Study various business models
- Analyze the practical corporate strategies.

Learning Outcome:

On Completion of the course, the students will be able to

- Demonstrate knowledge and skills in the logical foundations of informatics, data representation, models, structures and informatics-centric management.

UNIT- I INTRODUCTION **13 Hrs**

Strategy; Definition- Process– Level- Strategic decision making- Issues- Schools of thoughts-Strategic management- definition- Elements- process- Models- the Indian scenario.

UNIT - II ENVIRONMENTAL ANALYSIS **14 Hrs**

Environment- concept- characteristics- Classification of environmental sectors- Environmental scanning- Factors- Approaches- Sources of information- Methods & Techniques- Pitfalls- Appraisals.

UNIT-III SWOT ANALYSIS, STRATEGY FORMULATION AND ANALYSIS 13 Hrs

SWOT analysis - Strategy Formulation, Strategic Factors Analysis Summary (SFAS) Matrix, Business Strategy, Corporate Strategy, Functional Strategy, Strategic Choice.

UNIT- IV STRATEGY IMPLEMENTATION **12Hrs**

Strategy Implementation, Organization Structure, Corporate Culture, Diversification, Mergers and Acquisitions -Evaluation and Control, Strategic Information Systems.

UNIT - V STRATEGIC EVALUATION & CONTROL **13 Hrs**

Evaluation- Nature -Importance-Participants- Barriers- Requirements of effective evaluation; Strategic control- Operational control- Techniques – Role of organizational system control.

Text Book

- AzharKazmi. (2017). *Strategic Management & Business Policy*. Tata McGraw hill Publication.

Reference Books

- Mamoria, C.B and Satish Mamoria. (2018).*Business Planning and Policy.* Himalaya Publishing House.
- Sankaran, S. (2015).*Business Environment: Policy & Strategic Management.* Margham Publications.
- Francis Sirunilam. (2015.*Business policy and strategy and* publications Private Ltd.

E- Resources

- www.mbaskool.com/business.../7247-strategic-management-process.html

FINANCIAL MANAGEMENT

UBAM610/UCOM613/UCCM613

Semester : VI **Credits : 5**
Category : Core XIX **Hours/Week : 6**
Class & Major: III BBA/IIIB.Com/III B.Com (CA) **Total Hours : 78**

Objectives:
To enable the students

- Understand the nature and scope of Financial Management.
- Prepare budgets and take dividend policy.
- Develop the necessary skills and techniques to take decisions in corporate sectors.

Learning Outcome:
On Completion of the course, the students will be able to

- Demonstrate understanding of the goals of the finance manager.
- Identify the basic financial environment and institutions. Perform analytical reviews of financial results, proposals, and plans.
- Identify funding sources, instruments, and markets.

UNIT- I INTRODUCTION **13 Hrs**

Finance; Meaning- Scope- Goals. Financial Management: Meaning -Scope- Goals- Profit Maximization and Wealth Maximization in Organization.

UNIT–IICAPITAL STRUCTURE THEORY **16 Hrs**

Meaning - scope – Appraisals: Net Income Approach- Net Operating Income approach - MM approach and Traditional approach – Dividend Policy.

UNIT-III COST OF CAPITAL & LEVERAGES **16 Hrs**

Meaning – Significance - Types. Cost of Capital - Concepts- Importance-Classification: Cost of debt- Cost of Preference shares- Cost of equity and cost of retained earnings and weighted average cost of capital- Operating Leverage, Financial Leverage and Combined Leverage.

UNIT-IV CAPITAL BUDGETING **17 Hrs**

Concept - Importance – Methods Payback period method- Discounted cash flow methods – NPV- present value index and IRR method; Return onInvestment method.

UNIT-V WORKING CAPITAL MANAGEMENT & DIVIDEND POLICY **16 Hrs**

Working Capital Management –Cash management – Inventory Management – Receivable Management- Dividend theories and policy, types – factors influencing dividend.

Note: (Theory 40% and Problem 60%)

Text book

- Sharma, R.K, Shashi, K.Gupta. K. (2015). Financial Management. Kalyani Publications.

Reference books

- Maheswari, S.N. (2016). *Elements of Financial Management.* Sultan Chand and Sons.
- Khan, M.Y. & P.K.Jain. (2015). *Theory and Problems in Financial Management.*

E-Resources

- www.managementstudyguide.com/capital-structure.html
- www.managementstudyguide.com/financial-management.html
- www.sap.com/india/product/financial-mgmt.html.

BUSINESS ANALYTICS FOR MANAGERS

UBAM612

Semester : VI **Credits : 5**
Category : Core-XXIII **Hours/Week : 5**
Class &Major: III BBA **Total Hours : 65**

Objectives:

To enable the students

- Understand and critically apply the concepts and methods of Business Analytics.
- Identify, model and solve decision problems in different settings. Interpret results/solutions.
- Identify appropriate courses of action for a given managerial situation whether a problem or an opportunity.

Learning Outcome:

On Completion of the course, the students will be able to

- Enable all participants to recognise, understand and apply the language, theory and models of the field of business analytics.
- Foster an ability to critically analyse, synthesise and solve complex unstructured business problems.
- Encourage an aptitude for business improvement, innovation and entrepreneurial action.

UNIT – I THE BUSINESS ANALYTICS MODEL **12 Hrs**

Introductions – Overview of Business Analytics Model – Strategy Creation – Types of reporting and Analytical Processes – Data Warehouse and Sources – Evaluation of Business Analytics Processes – Case Studies.

UNIT –II ANALYTICS STRATEGY **12 Hrs**

Strategy and Business Analytics: Four Scenarios - Link between Strategy and Business Analytics - Link between - Strategy and the Deployment of BA- Strategy and BA: Four Scenarios- Requirements for Targets- Organization and sources of data-Importance of data quality-Dealing with missing or incomplete data-Data Classification

UNIT –III DEVELOPMENT AND DEPLOYMENT OF INFORMATION AT THE FUNCTIONAL LEVEL **12 Hrs**

Specification Requirements- Concept of Performance Management - Human Resource Development- Finance- Inventory Management- Supply Chain Management- CPM - Establishing New Business Processes-– Pricing - Human Resource Development - Corporate Performance Management – Finance - Inventory Management - Case Study.

UNIT –IV BUSINESS ANALYTICS AT THE ANALYTICAL LEVEL 14 Hrs

Data, Information, and Knowledge - Analyst's Role in the Business Analytics Model - Business Competencies - Analytical Methods – Hypothesis - Data Mining - Explorative Methods - Analyst's Role in the BA Model- Analyst Requirements- Selection of Analytical Method- Data, Information and Knowledge- Required Competency for Analyst.

UNIT – V THE COMPANY'S COLLECTION OF SOURCE DATA 13Hrs

Source Systems - Business Analytics Competency Center - Tasks and Competencies - New Business Analytics Initiatives Definition- Setup a Business Intelligence Competency Center- Centralized or Decentralized Organization - Uncovering the Value Creation of the Project- Business Analytics in Future - Case Study.

Text Books

- Gert,vH.N.Laursen,vJesper, Thorlund, (2016). *Business Analytics for Managers.* Margham Publications. New Delhi.
- Richard Vidgen, Sam Kirshnerand Felix Tan (2019).*Business Analytics*. Macmillan Education. UK

Reference Books

- Evans James, R. (2017).*Business Analytics*. Second Edition-Pearson Education.
- Prasad, R N. and Acharya, S. (2018). *Fundamentals of Business Analytics.* Wiley.

E-Resource

- www.wiley.com/go/eula to access Wiley's EBook EULA

WORKSHOP ON LEADERSHIP SKILLS

UBAR601

Semester : VI **Credits : 1**
Category : Core XXI **Hours/week : 1**
Class &Major : III BBA **Total Hours : 13**

Activities related to following topics

Topics	Activities
Problem solving, Communication skills to build a team.	Stand by your quote, Reality check
Influencing people	Leadership Dance card Centre stage
Decision making and problem solving	Leadership Swap Walking the talk
Team building	Leadership skills plan, Leadership challenged
Motivation and rewards	Leadership values, Leaders to admire

Online References

- http://www.workshopexercises.com/Leadership.htm#Activity%20Listing:
- http://www.studentleadershipchallenge.com/Resources-Activities.aspx
- http://lead.gmu.edu/training-resources/activities-and-exercises/
- https://www.envisionexperience.com/blog/leadership-building-activities-for-the-classroom-a-series.

PROJECT

UBAP601

Semester : VI **Credits : 4**
Category : Core XXI **Hours/week : 6**
Class &Major: III BBA **Total Hours : 65**

GUIDELINES

- This course is offered as group project
- No of students is limited to 5 to 6

RESEARCH AREA

- Human resource Management
- Finance
- Marketing
- Production

EVALUATION PATTERN FOR THE PROJECT (INTERNAL -60, EXTERNAL -40)

S.NO	Components	Marks	
		CIA	ESE
1.	Review of Literature	10	
2.	Title of the Topic	10	
3.	Statement of the problem	10	
4.	Research Design and statistical tool	10	
5.	Result	10	
6.	Project report	10	
7.	Writing report		20
8	Oral presentation		10
9	Viva-voce		10
Total		**60**	**40**

CONSUMER AFFAIRS

UBAO609

Semester : VI **Credits : 4**
Category : Major Elective **Hours/Week : 5**
Class & Major: III BBA **Total Hours : 65**

Objectives:

To enable the Students

- Rights and responsibilities as a consumer, the social framework of consumer rights and legal framework of protecting consumer rights.
- It also provides an understanding of the procedure of redress of consumer complaints, and the role of different agencies in establishing product and service standards.

Learning Outcome:

On Completion of the course, the students will be able to

- Students will have an understanding about the existing law on consumer protection in India.
- Students will be conversant with major international instruments on consumer protection.
- Students will be aware of the basic procedures for handling consumer dispute.

UNIT- I CONCEPTUAL FRAMEWORK: 13 Hrs

Consumer and Markets: Concept of Consumer, Nature of markets: Liberalization and Globalization of markets with special reference to Indian Consumer Markets, e-Commerce with reference to Indian Market, Concept of Price in Retail and Wholesale, Maximum Retail Price (MRP), Fair Price, GST, labeling and packaging along with relevant laws, Legal Metrology. Experiencing and Voicing Dissatisfaction: Consumer buying process, Consumer Satisfaction/dissatisfaction-Grievances-complaint, Consumer Complaining Behaviour: Alternatives available to Dissatisfied Consumers; Complaint Handling Process: ISO 10000 suite

UNIT –II THE CONSUMER PROTECTION LAW IN INDIA 13 Hrs

Objectives and Basic Concepts: Consumer rights and UN Guidelines on consumer protection, Consumer goods, defect in goods, spurious goods and services, service, deficiency in service, unfair trade practice, and restrictive trade practice. Organizational set-up under the Consumer Protection Act: Advisory Bodies: Consumer Protection Councils at the Central, State and District Levels; Adjudicatory Bodies: District Forums, State Commissions, and National Commission: Their Composition, Powers, and Jurisdiction (Pecuniary and Territorial), Role of Supreme Court under the CPA with important case law.

UNIT -III GRIEVANCE REDRESSAL MECHANISM UNDER THE INDIAN CONSUMER PROTECTION LAW 13 Hrs

Who can file a complaint? Grounds of filing a complaint; Limitation period; Procedure for filing and hearing of a complaint; Disposal of cases, Relief/Remedy available; Temporary Injunction, Enforcement of order, Appeal, frivolous and vexatious complaints; Offences and penalties.

UNIT – IV ROLE OF INDUSTRY REGULATORS IN CONSUMER PROTECTION 13 Hrs

I. Banking: RBI and Banking Ombudsman
II. Insurance: IRDA and Insurance Ombudsman
III. Telecommunication: TRAI
IV. Food Products: FSSAI

V. Electricity Supply: Electricity Regulatory Commission
VI. Real Estate Regulatory Authority

UNIT - V CONTEMPORARY ISSUES IN CONSUMER AFFAIRS 13 Hrs

Consumer Movement in India: Evolution of Consumer Movement in India, Formation of consumer organizations and their role in consumer protection, Misleading Advertisements and sustainable consumption, National Consumer Helpline, Comparative Product testing, Sustainable consumption and energy ratings.

Text Books

- 1. Khanna, Sri Ram, Savita Hanspal, Sheetal Kapoor, and H.K. Awasthi. (2007) Consumer Affairs. Universities Press.

Reference Book

- Choudhary, Ram Naresh Prasad, (2005). Consumer Protection Law Provisions and Procedure. Deep and Deep Publications Pvt Ltd.

E-Resources

- www.ncdrc.nic.in
- www.consumer affair

FINANCIAL MARKETS & SERVICES

UBAO610

Semester : VI **Credits : 4**
Category : Major Elective **Hours/Week : 05**
Class &Major : III BBA **Total Hours : 65**

Objectives:

To enable the students

- Understand the Indian Financial System, its constituents, the principles on which it operates, inter linkages and regulatory concerns.
- Familiarize with various types of financial services and their role in social change.
- Differentiate Innovative financial Services from Traditional financial services.

Learning Outcome:

On Completion of the course, the students will be able to

- Make an informed judgment about whether or to what extent a financial market satisfies the conditions of an efficient market
- Identify the main factors that could detract from that efficiency.

UNIT - I INTRODUCTION 15 Hrs

Financial services - meaning - Financial services and Economic Environment - Legal and Regulatory framework - Financial Institutions and other participants in the Financial Service Sector - Introduction to Leasing - Merits and Demerits - Types of Lease - Hire purchase vs. Lease.

UNIT - II CAPITAL AND MONEY MARKETS 16 Hrs

Capital and Money Markets - Instruments - Government - Securities Market - Credit rating agencies - CRISIL, CARE, ICRA - Services - Criteria for rating - Symbols. Objectives, powers and role of SEBI in investor protection.

UNIT - III FACTORING **16 Hrs**

Factoring - Types and feature of factoring agreement - Factoring vs. Bills discounting - Services of factor - Consumer finance and Credit Card Services - Forfeiting.

UNIT - IV VENTURE CAPITAL **15 Hrs**

Venture Capital - Meaning and characteristics - Criteria for assistance - Venture capital products/schemes and guidelines - Infrastructure financing - Assessment of risk - Legal aspects.

UNIT - V MUTUAL FUNDS **16 Hrs**

Mutual Funds - Types and Features - Management structure and performance evaluation - Growth and recent trends - Investor Services - SEBI Guidelines.

Text Books

- Gurusamy, S. (2015). *Financial Markets and Institutions.* Vijay Nicole Imprints Private Ltd.
- Khan, M.Y. (2015). *Indian Financial Services*. Tata McGraw Hill Publishing Company Limited.

Reference Books

- Balu, V. (2018). *Merchant Banking & Financial Services.* Sri Venkateswara Publication.
- Bhatia, B. S. & Bhatre. G. S.(2017). *Management of Capital Markets*. Financial services and Institutions, Deep and Deep Publishers.
- Bhole, L. M. (2018). *Finance Institutions and Markets*. Tata McGraw Hill.

CUSTOMER RELATIONSHIP MANAGEMENT

UBAO604

Semester : VI **Credits : 4**
Category : Major Elective **Hours/Week : 05**
Class & Major : III BBA **Total Hours : 65**

Objectives:
To enable the students

- Understand the importance of customer Satisfaction in todays' competitive world.
- Identify CRM process and apply for framework of successful CRM.
- Use the modern technologies to build customer relationship.

Learning Outcome:
On Completion of the course, the students will be able to

- Develop understanding about customer relationship management concepts and frameworks.
- Develop skills to analyse and synthesise information and issues, related to customer relationship management, from several perspectives.
- Enhance business communication skills required to work effectively within a marketing team.

UNIT-I INTRODUCTION **15 Hrs**

Introduction and significance of customer relationship marketing - Empowerment to service providers-Augment intangible benefits - Visit to the point of usage of the product - Develop partnership with customers - organizing customer clubs - Relationship based pricing schemes - Identifying with social events and concern for societal problem – effective customer

communication system - customer complaint monitoring cell - developing customer satisfaction index - concentration on customer satisfaction research - drawing the attention of competitors customers.

UNIT-II CRM PROCESS **15 Hrs**

Benefits of CRM Process- A closed –loop CRM Process – Major Technological Changes - Process flow choice - Repeat or iterative process - Four 'C's of CRM process – CRN process for Marketing Organizations - A Comparison with CMM Levels – Level one : Adhoc or initial ,Level two: Replicable or Repeatable, Level three: Focused or Defined, Level four: Managed, Level five : Optimized.

UNIT- III CRM IMPLEMENTATION **12 Hrs**

How to choose the Right CRM solution – A framework for Successful CRM – Implement Customer Performance Measures – Assess Package Solutions Against a mix of criteria - Consider Skill & Organizational Implications – Implementing CRM:AStep-by-step process- CRM implementation steps – Requirements or information gathering – Prototyping & detailed proposal generation - Five phases of CRM Projects - Train & retrain- support, system optimization, & follow up - CRM for client server model - CRM at work - Service files.

UNIT- IV BUILDING CRM **10 Hrs**

CRM Process framework – Governance Process – Performance Evaluation Process.

UNIT-V AN INSIGHT INTO CRM AND ECRM. **13 Hrs**

Overview of ECRM – Use of Technology in CRM – CRM Technology Tools – Implementation – Reasons and Failure of CRM.

Text Book

- Peeru Mohamed, H and Sagadevan,A. (2017). *Customer Relationship Management*. Vikas publishing house Pvt Ltd.

Reference Books

- Amrit Tiwana. (2016). The *Essentials Gained to Knowledge Management*. e - Business and CRM application. Pearson Education.
- Dr. Ravi Kalakota. (2017). *e -business Road Map for Success*. Pearson Education.

RETAIL MANAGEMENT

UBAO 605

Semester	**: VI**	**Credits**	**: 4**
Category	**: Major Elective**	**Hours/Week**	**: 05**
Class &Major:	**III BBA**	**Total hour**	**: 65**

Objectives:

- To acquaint with different types of retail outlets.
- To understand Customer Management and Show Room Management.
- To evaluate different retailing methods for different kinds of products.

Learning Outcome:

On Completion of the course, the students will be able to

- Identify key roles within retail businesses
- Classify the general steps of strategic planning in retail
- Identify a situation in which a customer has conflicting needs

UNIT-I INTRODUCTION **15 Hrs**

Meaning-Role in Marketing-Difference Between Retailing And Selling, Retail Sales-Outlets Department Stores, Multiple Shops-Chain Stores-Super Markets-Consumer Cooperative Store Employees-Cooperative Stores-Direct Sales-Petty Shops-Street Vendors.

UNIT–II ORGANIZATION OF RETAIL SALES **15 Hrs**

Retail Sales – Organization - Sales Manager - Role Duties And Responsibilities Qualities - Salesman - Training Of Salesman - Travelling Salesman – Motivating Salesman- Sales Incentives.

UNIT – III CUSTOMER MANAGEMENT **15 Hrs**

Customer Management – Difference Types Of Customers – Store Layout And Store Preferences – Why People Buy – Buying Decision Theory – Building Goodwill-Measuring Customer Purchases. Seasonal Variation in Sales-Methods of Increasing Sales.

UNIT – IV SHOW ROOM MANAGEMENT **15 Hrs**

Show Room Management- Building Layout – Lighting – Window –Display – Interior Display – Checking Shortage – Slow Moving And Unsold Stock Discount Sales – Round The Clock Sales, Returns And Maintenance Of Records – Shops And Establishment Act.

UNIT – V MERCHANDING **10 Hrs**

Retailing of services-Single brand outlet – Multi Brand outlet-Entry of Walmart

Text Book

- Baral, S.K, Bihari, S.C. (2015). *Retail Management*. AITBS publication.

Reference Books

- Morgenstern, M & Strong. (2016). *Modern Retailing Principles &Practice.* Tata McGrawHill.
- Davar, SR. (2017). *Salesmanship &Publicity*. Margham Publication.
- Schwartz. (2016). *Marketing Today A Basic Approach*. Kalyani Publications.

EMERGING BUSINESS PRACTICES IN MANAGEMENT

UBAO 606

Semester : VI **Credit : 4**
Category : Major Elective **Hours/Week : 5**
Class &Major: III BBA **Total Hours : 65**

Objectives:

To enable the students

- Understand the emerging business practices in India
- Realize the significance of IT enabled services
- Apply the above in Organizational context

Learning Outcome:

On Completion of the course, the students will be able to

- Identify core concepts of marketing and the role of marketing in business and society.
- Able to develop Six sigma's and Business launching
- Students should able to elaborate Emerging Trends in Business.

UNIT-I KNOWLEDGE MANAGEMENT 12 Hrs

Concept-Importance of KM in organizations, leaning organizations-KM process in organizations-Challenges in creating organizational knowledge-KM Strategies-Architecture and tools-KM Practices-Case studies.

UNIT-II SIX SIGMA 14 Hrs

Concept-Steps involved in launching Six Sigma-combining six sigma with quality-six sigma strategies-process improvement-Benefits derived-Case studies.

UNIT- III ENABLED SERVICE IN HRM 15 Hrs

Introduction-Data and information needs for HR manager-HR Management process and HRIS-HRIS and Employee Legislation-An Integrated View of HRIS.

UNIT-IV IT ENABLED SERVICES IN OTHER BUSIENSS DOMAIN 13 Hrs

Business/Knowledge process out sourcing-Enterprise resource planning-Threats in IT enabled services-Emergence and need of ERP-Strategies for ERP-Case studies.

UNIT- V CORPORATE GOVERNANCE 10 Hrs

Concept, Significance in Indian context, corporate social responsibility - Role of board of Directors - Recommendations of Birla committee and Narayanan murthy committee-Sarbanes-Oxley Act of 2002.

Text Books

- Dr. Kunal Gaurav. (2010). *Emerging trends in business*. ICBM. School of Business Excellence. Hyderabad. India
- Prof. Jitender Govindani. ICBM. School of Business Excellence. *Emerging trends in business*. Hyderabad. India.

Reference Books

- Ahuja, K.K. (2071). *Industrial Relations Theory &Practices*. Kalyani Publishers.
- Lal Das, D.K. (2018). *Industrial Relations in India*. Sultan Chand.

- Arun Monappa. (2016). *Industrial Relations in India.* Sultan Chand.

E-Resources

- https://www.wegate.eu/list-e-learning-materials-tools
- www.adam-europe.eu/prj/6726/project_6726_en.pdf
- www.uwcc.wisc.edu/info/women/escap2468.pd

INDUSTRIAL RELATIONS

UBAO 607

Semester : VI	**Credits : 4**
Category : Major Elective	**Hours/Week : 5**
Class &Major : III BBA	**Total Hours : 65**

Objectives:

To enable the students

- Understand the basic concepts of Industrial relations.
- Interpret the growth of trade unions and examine workers participation in management.
- Assess the practical industrial relations.

Learning Outcome:

On Completion of the course, the students will be able to

- The course helps the student understand and apply the concept of industrial relations and the system in which it operates.
- Students should able to outline the important causes & impact of industrial disputes
- Students should able to elaborate Industrial Dispute settlement procedures.

UNIT-I INTRODUCTION 12 Hrs

Industrial Relation; Meaning-Objectives – Scope – Models- Industrial Relations in India – History & growth of IR- Approaches to IR- State and Industrial Relations - Labour Policy – Emerging trends in India-Flexi hours-Tele community.

UNIT-II TRADE UNIONS 13 Hrs

Trade Unionism – Theories of Trade Unionism – Principles, Philosophy and Policies of Indian Labour – Growth of trade unionism in India – Management of Trade unions–Central organizations of Indian trade unions: INTUC, AITUC, HMS, UTUC- Problems of trade unions Main provisions of Trade unions Act, 1926.

UNIT- III INDUSTRIAL DISPUTES 13 Hrs

Industrial disputes & prevention and settlement –Industrial disputes- Meaning, clauses, causes, consequences, Prevention and settlement- Main provisions of IR act, 1947-Standing orders- Main provisions of Industrial Employments(Standing Orders) Act, 1946- Disciplinary Action/ Domestic Enquiry.

UNIT-IV COLLECTIVE BARGAINING 13 Hrs

Collective Bargaining - Objectives – Methods - Managements for negotiations - Union organization for bargaining - Pre requisites for the success of collective Bargaining-collective bargaining in India.

UNIT- V WORKERS PARTICIPATION IN MANAGEMENT 14 Hrs

Workers participation- Meaning, scope, objectives, levels of participation-conditions – forms –Works committee-Joint management council-Scheme of workers participation-shop council and plant council-workers participation share capital.

Text book

- Memoria, C.B. (2016). *Dynamics of Industrial Relations in India*. Himalaya Publishing House.

Reference Books

- Ahuja,K.K. (2071). *Industrial Relations Theory &Practices*. Kalyani Publishers.
- Lal Das, D.K. (2018). *Industrial Relations in India*, Sultan Chand.
- Arun Monappa. (2016). *Industrial Relations in India.* Sultan Chand.

E-Resources

- https://www.wegate.eu/list-e-learning-materials-tools
- www.adam-europe.eu/prj/6726/project_6726_en.pdf
- www.uwcc.wisc.edu/info/women/escap2468.pdf

RURAL MARKETING

UBAO608

Semester : VI **Credits : 4**
Category : Major Elective **Hours/Week : 5**
Class &Major : III BBA **Total Hours : 65**

Objectives:

To enable the students

- Understand rural marketing scenario in India.
- Examine the consumer behaviour in rural market.
- Analyse the impact of government schemes in rural development.

Learning Outcome:

On Completion of the course, the students will be able to

- An ability to apply knowledge, skills and right attitude necessary to provide effective leadership in a global environment.
- An ability to develop competent management professionals with strong ethical values, capable of assuming a pivotal role in various sectors of the Indian Economy & Society, aligned with the national priorities.
- An ability to develop proactive thinking so as to perform effectively in the dynamic socio-economic and business ecosystem.

UNIT-I INTRODUCTION 13 Hrs

Rural Marketing- Definition- Scope - Concepts- Components- Classification - Rural versus Urban Markets Problems- Rural Marketing Environment: Population- Occupation Pattern- Income Generation-Location of Rural Population- Expenditure Pattern- Land Distribution-Land Use Pattern- Development Programs- Infrastructure Facilities- Rural Credit Institutions.

UNIT- II RURAL CONSUMER BEHAVIOUR **14Hrs**

Consumer Behaviour – Factors; Social - Technological - Economic – Political. Characteristics of Rural Consumer: Age and Stages of the Life Cycle- Occupation and Income- Economic Circumstances- Lifestyle- Personality and Brand Belief- Information Search and Pre Purchase Evaluation.

UNIT- III RURAL MARKET RESEARCH **12 Hrs**

Sanitizing Rural Market- Research Design - Reference Frame- Research Approach- Diffusion of Innovation- Development Studies- PRA Approach- The Need for PRA-Sampling- Operational Aspects of Data Collection.

UNIT- IV RURAL MARKETING STRATEGIES **12 Hrs**

Segmenting- Targeting and Positioning Segmentation-Basis of Segmentation and Approaches to Rural Segmentation .Product strategy for rural markets. Concept and significance. Product mix and product item decisions- Competitive product strategies- Pricing strategy in rural marketing: Concept- Significance- Objectives- Policy and strategy.

UNIT- V FUTURE OF RURAL MARKETING **14 Hrs**

Introduction- Focused Marketing Strategies- Market Research- Consumer Finance- Rural Vertical- Retail and IT Models- Rural Managers-Glamorize Rural Marketing- Public-Private Partnership- E-Rural Marketing-Case Studies in Indian Context.

Text Book

- Krishnamacharyulu, C.S.G. & Lalitha Ramakrishnan.(2015). Rural Marketing. Text and Cases- Pearson education.

Reference Books

- Habeeb Ur Rahma. (2016). Rural Marketing. HPH.
- Robert Chambers. (2017). *Rural Development: Putting the last first.* Pearson education.

V& VI SEMESTER EVALUATION COMPONENTS OF CIA

Sem	Category	Course Code	Course Title	Component III	Component IV
V	Core XX	UBAM510	Business Informatics	Poster presentation	Album making
VI	Core-XXIII	UBAM612	Business Analytics for Managers	Assignment	Case studies

DEPARTMENT OF COMMERCE

PREAMBLE

UG : Programme profile and the syllabi of courses offered in semester V and VI along with III and IV evaluation Components (with effect from 2018-2021 batch onwards) are presented in this booklet.

PROGRAMME PROFILE: B.Com.

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, 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	UTAL105/ UTAL106/ UHIL102/ UFRL102	Basic Tamil I/ Advanced Tamil I/ Hindi I / French I	UTAL103/ UTAL104/ UHIL101/ UFRL101	4	2/3
	II	Part II	UENL107/ UENL108	General English -I / Advanced English- I	--/ UENL106	5	3/4
	III	Core I	UCOM103/ UCCM103	Fundamentals of Commerce	---	2	1
		Core II	UCOM104/ UCCM102	Financial Accounting	UCOM103/ UCCM101	6	5
		Allied I	UCEA103	Business Economics	UCEA102	6	5
		Allied II	UMAA112	Business Mathematics	UMAA214	5	4
	IV	Value Education				2	1
					TOTAL	**30**	**21/23**
II	I	Part I	UTAL205/ UTAL206/ UFRL202/ UHIL202	Basic Tamil – II/ Advanced Tamil –II/ French – II/Hindi – II	UTAL203/ UTAL204/	4	2/3
	II	Part II	UENL207/ UENL208	General English II/ Advanced English II	---/ UENL206	5	3/4
	III	Core III	UCOM204/ UCCM203	Business Correspondence	---	4	4
		Core IV	UCOM206/ UCCM206 UCOM507 UCCM507	Management Accounting	UCOM507/ U CCM507/ UBA M408	5	4
		Allied III	UCEA202	Indian Economic Development	UCEA301	5	4
		Core V	UCOR202/ UCCR202/ UIAR201	Industry Interface Programme I – Banking and Insurance	UCOR205	1	1

	IV	Non Major Elective				4	2
		Soft skills				2	1
	V	Extension Activity/ Physical Education/ NCC				-	1/2
					TOTAL	**30**	**22/25**
III	III	Core VI	UCOM305/ UCCM305/ UBAM310	Cost Accounting	UCOM501/ U CCM501	5	4
		Core VII	UCOM306 / UCCM306/ UBAM308	Marketing Management	UCOM606/ UCCM601	5	4
		Core VIII	UCOM307/ UBAM309	Financial Markets & Services	UCOM303	6	4
		Core IX	UCOM308/ UCCM308	Accounting for Non - Trading Concerns	---	4	4
		Online Course		NPTEL/ Spoken Tutorial	---	3	1/2
		Allied IV	UMAA301	Business Statistics		5	4
		Value Education				2	1
					TOTAL	**30**	**22/23**
IV	III	Core X	UCOM407	Banking Law & Practice	UCOM201	5	5
		Core XI	UCOM408/ UCCM408	Corporate Accounting	UCOM304/ UCCM304	5	4
		Core XII	UCOM409/ UCCM409	Business law	UCOM302/ UCCM302	5	4
		Core XIV	UCOR402/ UCCR402 UIAR401	Industry Interface Programme II – Stock Market & Mutual Fund	UCOR411	1	1
		Core XV	UCOM412 / UCCM412	Security Analysis & Portfolio Management	---	4	4
		Core XVI	UCOP501/ UCCP501/ UIAP501/ UCOM511 /UCCM511	Project / Principles and Practice of Insurance	---	2	--
		Allied V	UCSA407	Cyber Security in Finance	Allied	3	3
		Allied Practical I	UCSR413	Cyber Security – Lab	Allied	3	2
	IV	Soft Skills				2	1
	V	Extension Activity Physical				-	0/2

		Education/ NCC					
					TOTAL	**30**	**24/26**

V	III	Core XVII	UCOM506/ UCCM506	Company Law	UCOM503/ UCCM503	6	4
		Core XVIII	UCOM508	Practical Auditing	--	6	5
		Core XIX	UCOM509/ UCCM509 UIAM503	Income Tax Law & Practice I	UCOM502/ UCCM502	6	5
		Core XX	UCOM510/ UCCM510/ UIAM504	Accounting Package	UCOM604/ UCCM604	3	2
		Core Practical I	UCOR501/ UCCR501/ UIAR501	Accounting Package – Lab	UCOR605/ UCCR605	3	3
		Core XXI	UCOP501/ UCCP501/ UIAP501/ UCOM511 /UCCM511	Project/Principles and Practice of Insurance	---	4	4
	IV	Value Education				2	1
					TOTAL	**30**	**24/24**
VI	III	Core XXII	UCOM612/ UBAM609/ UIAM601	Women Entrepreneurship	---	5	5
		Core XXIII	UCOM614/ UCCM614/ UBAM610	Financial Management	UCOM613/ UCCM613/ UBAM610	6	5
		Core XXIV	UCOR602/ UCCR602/ UIAR601	Industry Interface Programme III - GST Practical	UCOR615/ UCCR615	1	1
		Core XXV	UCCM616/ UCOM616/ UIAM604	Goods and Services Tax	---	6	5
		Core XXVI	UCOM617/ UCCM617/ UIAM605	Service Marketing	---	5	5
		Viva Voce	UCOM607/ UCCM607/ UIAM606	Comprehensive Viva	---	-	1
		Major Elective	UCOO605/ UCCO605/ UIAO607	1. E-Marketing	---	5	4
			UCOO606/ UCCO606/ UIAO608	2. Income Tax Law & Practice II	UCOM602/ UCCM602		
			UCOO607/ UCCO607/ UIAO609	3. Consumer Protection	---		
	IV	Soft skills				2	1
	V	Extension Activity/ Physical				-	-/2

		Education /NCC					
				TOTAL		**30**	**27/29**
				GRAND TOTAL		**180**	**140/150**

DEPARTMENT OF COMMERCE

PREAMBLE:

UG : Programme Profile and Syllabi of courses offered in semester V and VI along with III and IV evaluation components (With effect from 2018 – 2021 batch onwards) are presented in this booklet.

PROGRAMME PROFILE: B.Com. (CA)

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	UTAL105/ UTAL106/ UFRL102/ UHIL102	Basic Tamil – I/ Advanced Tamil – I/ French – I/Hindi –I	UTAL103/ UTAL104/	4	2/3
	II	Part II	UENL107/ UENL108	General English -I/ Advanced English-I	---/ UENL106	5	3/4
	II I	Core I	UCCM103/ UCOM103	Fundamentals of Commerce	---	2	1
		Core II	UCCM102/ UCOM104	Financial Accounting	UCOM103/ UCCM101	6	5
		Allied I	UCSA104	C Programming		3	3
		Allied Practical I	UCSR110	C Programming – Lab		3	2
		Allied II	UMAA112	Business Mathematics		5	4
	I V	Value Education				2	1
					TOTAL	**30**	**21/23**
II	I	Part I	UTAL205/ UTAL206/ UFRL202/ UHIL202	Basic Tamil – II/ Advanced Tamil –II/ French – II/Hindi –II	UTAL203/ UTAL204/	4	2/3
	II	Part II	UENL207/ UENL208	General English/ Advanced English	---/ UENL206	5	3/4
	III	Core III	UCCM203/ UCOM204	Business Correspondence	---	4	4
		Allied III	UCSA204	Object Oriented Programming		2	2
		Allied Practical II	UCSR207	Object Oriented	UCEA301	3	2

				Programming - Lab			
		Core IV	UCCM206/ UCOM206/ UCCM407/ UCOM407	Management Accounting	UCOM507/ UCCM507/ UBAM408	5	4
		Core V	UCCR206/ UCOR206/ UIAR203	Industry Interface Programme I – Banking and Insurance	UCCR205	1	1
	IV	Non Major Elective				4	2
	IV	Soft skills				2	1
	V	Extension Activity/ Physical Education/NCC				-	1/2
					TOTAL	**30**	**22/25**
		Core VI	UCCM305 /UCOM305	Cost Accounting	UCCM501	5	4
III	III	Core VII	UCCM306/ UCOM306/ UBAM308	Marketing Management	UCCM606	5	4
		Core VIII	UCCM308/ UCOM308	Accounting for Non - Trading Concerns	---	4	4
		Online		NPTEL/ Spoken Tutorial	---	3	1/2
		Allied IV	UCSA305	Fundamentals of Block Chain Technology	---	3	3
		Allied Practical III	UCSR309	Block Chain Technology using Solidity - Lab	---	3	2
		Allied	UMAA309	Business Statistics	UMAA403	5	4
	IV	Value Education				2	1
					TOTAL	**30**	**23/24**
IV	III	Core IX	UCCM405	e-Banking	---	5	5
		Core X	UCCM408/ UCOM408	Corporate Accounting	UCCM304	5	4
		Core XI	UCOM409/ UCCM409	Business Law	UCCM302	5	4
		Core XII	UCCR411/ UCOR413/ UIAR404	Industry Interface Programme II – Stock Market and Mutual Fund	UCCR410	1	1
		Core XIV	UCCP501/ UCOP501/ UIAP501/ UCCM511/ UCOM511	Project/Principles and Practice of Insurance	---	2	-
		Core XIII	UCOM412 / UCCM412	Security Analysis & Portfolio Management	---	4	4
		Allied V	UCSA406	Digital Marketing Analytics		3	3

		Allied Practical IV	UCSR412	Web Design - Lab		3	2
	IV	Soft skills				2	1
	V	Extension Activity/ Physical Education/ NCC				-	-/2
					TOTAL	**30**	**24/26**
V	III	**Core XV**	UCCM506/ UCOM506	Company Law	UCCM503	6	4
		Core XVI	UCCM509/ UCOM509/ UIAM503	Income Tax Law & Practice I	UCCM502	6	5
		Core XVII	UCCM510/ UCOM510/ UIAM504	Accounting Package	UCCM604	3	2
		Core Practical I	UCOR501/ UCCR501/ UIAR501	Accounting Package – Lab	UCCR605	3	3
		Allied VI	UCSA509	Business Analytics and Intelligence	---	3	3
		Allied Practical V	UCSR512	Business Analytics and Intelligence using SAS – Lab	---	3	2
		Core XVIII	UCOP501 /UCCP501 UCOM511/ UCCM511	Project/Principles and Practice of Insurance	---	4	4
	IV	Value Education				2	1
					TOTAL	**30**	**24/24**
VI	III	Core XIX	UCCM615	E- Entrepreneurship	---	5	4
		Core XX	UCCM614/ UCOM614/ UBAM610	Financial Management	UCOM613/ UCCM613/ UBAM610	6	5
		Core XXII	UCCR618/ UCOR618/ UIAR603	Industry Interface Programme III – GST Practical	UCCR615/ UCOR615	1	1
		Core XXIII	UCCM616/ UCOM616/ UIAM604	Goods and Services Tax	---	6	5
		Core XXI	UCCM617/ UCOM617/ UIAM605	Service Marketing	---	5	5
		Viva Voce	UCCM607/ U COM607/ UIAM606	Comprehensive Viva	---	-	1

		Major Elective	UCCO605/ UCOO605/ UIAO607	1. E-Marketing	---	5	4
			UCCO606/ UCOO606/ UIAO608	2.Income Tax Law & Practice II	UCCM602		
			UCCO607/ UCOO607/ UIAO609	3. Consumer Protection	---		
	IV	Soft skills				2	1
	V	Extension Activity/ Physical Education/ NCC				-	-/2
					TOTAL	**30**	**26/28**
					GRAND TOTAL	**180**	**140/150**

COMPANY LAW

UCOM506/UCCM506/ UIAM501

Semester : V **Credits : 4**
Category : Core XVII/XV **Hours/Week: 6**
Class &Major : III B.Com / B.Com CA /B.Com.(IA&T) **Total hours : 68**

Objectives:

To enable the students

- Understand the Provisions of Company law.
- Develop knowledge on incorporation of a Company.
- Gain knowledge on procedure for issue and transfer of shares

Learning outcomes:

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

- Prepare the documents required for registration of a Company
- Form and manage the companies

UNIT- I INCORPORATION OF A COMPANY **12 Hrs**

Company – Definition –Characteristics-Corporate Veil- Kinds of Companies – Incorporation – Memorandum of Association – Ultra Vires – Alteration of Memorandum.

UNIT- II REGISTRATION DOCUMENTS **14 Hrs**

Articles of Association – Contents – Alteration – Doctrine of Constructive Notice – Indoor Management – Prospectus-Contents-Consequences for Misstatement in Prospectus.

UNIT- III ISSUE OF SHARES **14 Hrs**

Shares – Kinds of Shares-Equity-Preference shares-Allotment of Shares-Minimum Subscription-Share Certificate -Share Warrant – Issue of Shares on Premium and discount – Redemption of Preference shares- Forfeiture of shares.

UNIT-IV TRANSFER OF SHARES **13 Hrs**

Membership of Companies – Transfer and Transmission of Shares – Blank transfer – Forged transfer.

UNIT-V MANAGEMENTOFCOMPANIES **12 Hrs**

Management of Companies – Board of Directors –Appointment-Duties and Powers of the Board- Managing Director –Manager-Appointment-Duties and Powers- Company meetings – Notice, Quorum ,Proxy, Minutes, Resolution.

Text Books

- Kapoor, N.D. (2019). *Company Law.* Sultan Chand. New Delhi.
- Avatar Singh (2019). *Company Law,* Book Well Publishers. New Delhi

Reference Books

- Kathiresan and Radha . (2020). *Company Law*, Prasanna Publishers. Chennai.
- Balanchandran B, Boose P.K. (2019). *Company Law*, Sultan Chand. New Delhi.

PRACTICAL AUDITING

UCOM508

Semester	**: V**	**Credit**	**: 5**
Category	**: Core XVIII**	**Hours/Week**	**: 6**
Class &Major	**: III B.Com**	**Total hours**	**: 78**

Objectives:

To enable the student

- Gain basic knowledge on the principles and practice of Auditing
- Verify the books of accounts and deduct errors and frauds
- Distinguish between auditing and accounting
- Distinction between investigation and auditing

Learning outcomes:

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

- Demonstrate an understanding of the objectives and importance of auditing.
- Describe and discuss audit planning.
- Verify and Value Assets and Liabilities of a Company.
- Explain the law relating to appointment of Auditors.
- interpret different types of audit reports

UNIT –IINTRODUCTION **16 Hrs**

Meaning and definition of auditing – Objectives – Errors and fraud – Importance, advantages of an audit – Distinction between Accountancy and Auditing – Various types of Audit-Cost, Management, Process & Environment.

UNIT – IIAUDITPLANNING **15 Hrs**

Audit planning – Audit programme – Advantages of audit programme – Preliminaries and the commencement of audit, internal check, internal control –Internal audit and continuous audit – audit working paper and audit note book

UNIT - III VERIFICATION AND VALUATION OF ASSETS AND LIABILITIES **16 Hrs**

Audit techniques, vouching, verification and valuation of assets and liabilities

UNIT - IV DUTIES & RESPONSIBILITIES OF AN AUDITOR **16 Hrs**

Law relating to appointment of Auditors, Qualification, Rights, duties and liabilities

of auditors.

UNIT - VAUDITING REPORT **15 Hrs**

Auditing report- significance –Kinds of audit report- Investigation- Meaning- Distinction between investigation and auditing – Computer applications in auditing.

Text Books

- Tandon, B.N. (2014), *Handbook of Practical Auditing.* S.Chand& Co. Ltd. New Delhi.
- KarPagare (2014). *Principles and Practice of Auditing.* Sultan Chand & Sons.New Delhi.

Reference Books

- Tandon B.N (2018), *Auditing*. S.Chand & Co. New Delhi.
- Spicer and Pegler, (2019), *Auditing*, Macmillan Publishers. New Delhi.
- Ghatalaia and Spicer (2018). *Practical Auditing*. S.Chand & Co. New Delhi.

INCOME TAX LAW AND PRACTICE – I

UCOM509/UCCM509/UIAM503

Semester : V	**Credits : 5**
Category : Core XIX/ XVI	**Hours/Week: 6**
Class & Major: III B.Com / B.Com CA/B.Com.(IA&T)	**Total Hours : 78**

Objectives:

To enable the students

- Gain knowledge on Principles and Practice of Income Tax Act in India.
- familiarize the different know-how and 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-IINTRODUCTION **15 Hrs**

Meaning of Income – Canons of Taxation – Important definitions under the Income Tax Act -Scope of Total income – Residential Status – Incomes Exempt from Tax

UNIT- II COMPUTATION OF INCOME FROM SALARIES **16 Hrs**

Income from Salaries – Scope of Salary Income – Deductions from salary Income

UNIT-III COMPUTATION OF INCOME FROM HOUSE PROPERTY **16 Hrs**

Income from House Property – Deductions- Profit and Gains of Business or Profession – Deemed Business profits – Allowed and Disallowed expenses.

UNIT- IV COMPUTATION OF CAPITAL GAIN **15 Hrs**

Capital Gain – Short Term and Long Term Capital Gain – Exempted Capital Gain

UNIT- V COMPUTATION OF INCOME FROM OTHER SOURCES **16 Hrs**

Income from Other Sources – Deductions.

Note: Theory 20% and Problem 80%

Text Books

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

Reference Books

- Vinod Singhania (2020). *Students Guide to Income Tax.* Taxmann Publication Pvt. Ltd. New Delhi.
- Dinkar Pagare (2020). *Income Tax Law & Practice.* Sultan Chand & Sons. New Delhi.

E-Resources:

- www.taxmann.com www.cbdt.gov.in

ACCOUNTING PACKAGE-THEORY

UCOM510/UCCM510/UIAM504

Semester	**: V**	**Credits**	**: 2**
Category	**: Core XX/XVII**	**Hours/Week**	**: 3**
Class &Major: III B.Com / B.Com CA/B.Com.(IA&T)		**Total hours**	**: 39**

Objectives:

To enable the students

- Gain basic knowledge in computerized accounting.
- Create company data, vouchers and inventories.
- Distinguish between computerized accounting and manual accounting

Learning outcomes:

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

- Extract financial and business reports
- Create different types of budgets

UNIT-I INTRODUCTION TO COMPUTERIZED ACCOUNTING 5 Hrs

Meaning of Computerized Accounting – Meaning of Computers – Importance of Computerized Accounting – Computerized Accounting Vs Manual Accounting- Introduction to Architecture of Tally – Creation of Company – Creation of Groups – Various Kinds of Groups – Multiple & Single – Creation of Ledgers – Various Kinds of Ledgers.

UNIT-II CREATION OF VOUCHERS 5 Hrs

Entering Vouchers – Journal Voucher, Purchase Voucher, Sales Voucher, Receipt Voucher, Payment Voucher – Role and the importance of Function Keys.

UNIT-III PREPARATION OF FINAL ACCOUNTS 5 Hrs

Extraction of Trial Balance, Trading Account, Profit and Loss Account and Balance Sheet – Simple Sums with and without Adjustments – Alter-Select –Edit – Delete–Selection of Company.

UNIT-IV CREATION OF INVENTORY **5 Hrs**

Introduction to Inventories – Creation of Stock Category – Stock Groups – Stock Items– Editing and Deletion of Stock items – Usage of Stock in Voucher Entry – Stock Voucher or Purchase Orders – Sales Orders - Customer and Supply Analysis – Extracting simple Reports and Graphs.

UNIT- V CREATION OF COST CENTRE **6 Hrs**

Introduction to Cost – Creation of Cost Category – Cost Center Category – Editing and Deleting Cost Centre –Usage of Cost Category and Cost Centers in Voucher Entry– Budget Control – Creation of Budgets – Editing and Deleting Budgets – Reports.

Proportion: Problem: 80%, Theory: 20%

Text Books

- Nadhani, A.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 (2019). *Computer Applications in Business*. Sultan Chand & Sons.

ACCOUNTING PACKAGE-LAB

UCOR501/UCCR501/UIAR501

Semester	**: V**	**Credits**	**: 3**
Category	**: Core Practical lI**	**Hours/Week**	**: 3**
Class &Major	**: III B.Com / B.Com CA/**B.Com.(IA&T)	**Total hours**	**: 39**

To enable the students

- Gain knowledge on application of Computers in accounting.
- Create vouchers, journals and stock groups.

Learning outcomes:

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

- Prepare Journal, Ledger and Trial balance
- Prepare Trading, Profit and Loss Account and Balance Sheet

Practical

1. Creation of Company, alteration and deletion
2. Creation of groups, single and multiple
3. Vouchers and Journals
4. Entering values and preparation of Trial balance, Trading account and balance Sheet
5. Use of function keys and entering various journals to understand adjustments
6. Preparation of final accounts with adjustments
7. Creation of stock groups, stock category and stock store
8. Entering data in stock groups of a departmental tore
9. Multiple stock group
10. Cost Centre

PROJECT

UCOP501/UCCP501

Semester : IV&V **Credits : 4**
Category : Core XXI/XVIII **Hours/Week : 6(2+4)**
Class & Major: III B.Com / III B.Com CA **Total Hours : 78**

Guidelines

- This course is offered as group project.
- No of students is limited to 5 to 6 in a group.

Research Area

- Finance
- Marketing and
- Banking

Evaluation Pattern for the project (Internal -60, External -40)

S. No.	Components	CIA	ESE
1	Title of the Topic & Research Design	10	
2	Review of Literature	10	
3	Collection of Data	10	
4	Analysis and Interpretation	10	
5	Viva voce	10	10
6	Project Report	10	30
	Total	**60**	**40**

PRINCIPLES AND PRACTICE OF INSURANCE

UCOM511/UCCM511

Semester : IV & V **Credit : 4**
Category : Core XXI/XVIII **Hours/Week : 6(2+4)**
Class & Major: III B. Com / III &B.Com CA **Total Hours : 78**

Objectives

To enable the students

- To understand the nature of insurance and the principles that governs general insurance.
- Gain knowledge on Life and General Insurance
- Distinguish between Life and General Insurance
- Distinguish between Marine and Fire Insurance

Learning outcomes:

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

- Protect themselves against business risks.
- Protect themselves against personal risks.

UNIT- I INTRODUCTION TO INSURANCE **10 Hrs**

Insurance– Meaning – Functions– Nature and Principles of Insurance – Growth of insurance business in India – Insurance regulation and IRDAI – Insurance organizations.

UNIT- II LIFE INSURANCE **16 Hrs**

Life Insurance: Meaning – Overview of the Indian life insurance market – Types of life insurance – Personal financial planning and life insurance – Insurance agents and their functions– Investment of Funds – Surrender Value –Bonus Option – Policy Condition – Annuity Contracts.

UNIT- III GENERAL INSURANCE **16 Hrs**

General Insurance: Meaning – Overview of Indian general insurance market – Types of general insurance – General insurance companies in India – Insurance broking firms.

UNIT- IV MARINE & FIRE INSURANCE **18 Hrs**

Contract of Marine Insurance – Elements of Marine Insurance –Clause in a Marine Insurance Policy –Marine losses – Fire Insurance – Features of a Fire Insurance – Kinds of Policies – Policy Conditions– Payment of Claims – Reinsurance.

UNIT–V HEALTH & MISCELLANEOUS INSURANCE **18 Hrs**

Health Insurance: Meaning and Importance of Health insurance and Mediclaim policies– Types of health insurance policies – Miscellaneous Insurance – Motor insurance – Agricultural insurance – Personal Accident Insurance.

Note: Unit I & II under IV semester, Remaining III unit to V unit under V th semester

Text Books

- Mishra, M.N. (2019). *Insurance Principles and Practice.* S.Chand & Co. New Delhi.
- Srinivasan (2019). P*rinciples of Insurance Law.* Ramanujam Publisher. Bangalore.

Reference Books

- Varadharajan ,B. (2019). *Insurance Vol.1 and 2* , Tamilnadu Text Book Society. Chennai.
- Sharma,R.S. (2019). *Insurance: Principles and Practice.* S.Chand & Co. New Delhi.

WOMEN ENTREPRENEURSHIP

UCOM612 / UBAM609 / UIAM601

Semester	**: VI**	**Credit**	**: 05**
Category	**: Core XXII/XIX**	**Hours/Week**	**: 05**
Class/Major	**: III B.Com/ BBA/** B.Com.(IA&T)	**Total hours**	**: 65**

Objectives:

To enable the students

- Understand the role of women entrepreneurship in different facets of society.
- Gain knowledge on financial assistance offered by various financial institutions
- Elucidate the role of various developmental schemes supporting women entrepreneurship

Learning outcomes:

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

- Draft a business proposal
- Establish a small business unit.

UNIT - I INTRODUCTION TO ENTREPRENEURSHIP **10 Hrs**

Entrepreneur and Entrepreneurship – Concept- Characteristics, Functions and types of entrepreneur; Intrapreneurship, Homepreneurship. Growth of entrepreneurship in India – - Theories of Entrepreneurship

UNIT – II PROJECT IDENTIFICATION **13 Hrs**

Search for a Business Idea- Product, Process identification – Sources and Selection – Project Classification and Identification – Constraints - Project life cycle-Project formulation–Need, Concept, Significance and elements of project formulation – Feasibility analysis – Project report – Methods of project appraisal – Plant layout- Business ideas, Plan, layout Presentation.

UNIT – III GOVERNMENT POLICIES **14 Hrs**

Concept and growth of women entrepreneur-Problems and prospects of women entrepreneurship-Government policies-Financial assistance - Government schemes for women entrepreneurship-Tamilnadu Industrial Corporation for development -Women entrepreneurship in India-Successful women entrepreneurs.

UNIT – IV PROJECT FINANCE **14 Hrs**

Need and Importance **-** Institutional finance to Entrepreneurs – Commercial banks and Development banks – SIDBI, TIIC, IDBI–Institutional support to entrepreneurs.

UNIT – V ESTABLISHMENT OF SMALL BUSINESS **14 Hrs**

Steps for starting a small Industries – Selection of organizations – Preparation of project proposal- Procedure and formalities for Registration- Government policy for small and medium scale enterprises - Taxation Benefits to small-scale industry.

Text Books

- Gupta, C.B & Srinivasan, N.P. (2019). *Entrepreneurial Development.* Sultan Chand & Co New Delhi.
- Charan, S. (2020). *Entrepreneurial Development* & Small Business Enterprise. Pearson Education. New Delhi.

Reference Books

- Jayshree Suresh, (2019). *Entrepreneurial Development.* Margham Publications. Chennai.
- Sujata ,V. (2019). *Entrepreneurial Development.* Cauvery Publications. Trichy.
- Prasanna Chandra (2020). *Entrepreneurship Development.* Tata Mc Graw Hill. New Delhi.

E-Resources

- https://www.wegate.eu/list-**e**-learning-materials-tools
- www.adam-europe.eu/prj/6726/project_6726_en.pdf
- *www.uwcc.wisc.edu/*info/women/*escap2468.pdf*

FINANCIAL MANAGEMENT
UCOM614/UCCM614/ UBAM610

Semester	**:VI**	**Credits**	**: 05**
Category	**: Core XXIII/ XX**	**Hours/Week**	**: 06**
Class/Major	**: III B.Com/B.Com (C.A)/BBA**	**Total Hours**	**: 78**

Objectives:
To enable the students

- Understand the nature and scope of Financial Management.
- Aware about capital structure and theories of capital structure
- Understand the cost of capital in wide aspects
- Gain knowledge about dividend theories and policies

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

- Develop the necessary skills and techniques to take financial decisions
- Manage working capital

UNIT-IINTRODUCTION **13 Hrs**

Financial Management: Meaning – Scope- Goals- Profit maximization and wealth Maximization in organization.

UNIT-II CAPITAL STRUCTURE THEORY **16 Hrs**

Meaning - Scope – Appraisals: Net Income Approach- Net Operating Income approach - MM approach and Traditional approach – Dividend Policy.

UNIT-III COST OF CAPITAL & LEVERAGES **16 Hrs**

Meaning – Significance - Types. Cost of Capital - Concepts- Importance- Classification: Cost of debt- Cost of Preference shares- cost of equity and cost of retained earnings and weighted average cost of capital- Operating Leverage, Financial Leverage and Combined Leverage.

UNIT-IV CAPITAL BUDGETING **17 Hrs**

Concept - Importance – Methods: Payback period method- Discounted cash flow methods – NPV- present value index and IRR method; Return on Investment method.

UNIT-V WORKING CAPITAL MANAGEMENT & DIVIDEND POLICY **16 Hrs**

Working Capital Management –Cash management – Inventory Management – Receivable Management- Dividend theories and policy, types – Factors influencing dividend policy.

Note-Theory 40%, Problem 60%

Text Books

- Sharma, R.K. (2020), Financial Management. Kalyani Publications. New Delhi.

- Pandey, I.M. (2020), Financial Management. Vikas Publishing House Pvt. Ltd. New Delhi.

Reference Books

- Maheswari, S.N.(2019). Financial Management. Sultan Chand and Sons. New Delhi.
- Khan and Jain (2019). *Financial Management* . Sultan Chand and Sons. New Delhi.

E-Resources

- *www.managementstudyguide.com/capital-structure.html*
- www.managementstudyguide.com/financial-management.html
- *www.sap.com/india/product/financial-mgmt.html*

INDUSTRY INTERFACE PROGRAMME III – GST PRACTICAL

UCOR602/UCCR602/UIAR601

Semester	**: VI**	**Credits**	**:1**
Category	**: Core XXIV/XXII**	**Hours/Week**	**:1**
Class & major	**: III B.Com & III B Com CA/** B.Com. IA&T)	**Total Hours**	**: 13**

Objectives

To enable the students

- Understand the concept of GST Policy and Procedure
- Apply principle for practicing GST in the firm.
- Gain knowledge on filing monthly, quarterly and annual GST Returns.

Learning outcomes:

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

- Gain working knowledge on GST and application of the same in the organizations.
- Understand and make use of knowledge of GST rules in Tax planning.
- Compute GST liability and File monthly, quarterly and annual GST returns

GST PRACTICAL

GSTR - 1

GSTR – 2A

GSTR - 2

GSTR - 3

GSTR – 3B

GSTR – 4/CMP - 08

GSTR - 5

GSTR - 6

GSTR - 7

GSTR - 8

GSTR - 9

GSTR – 9A

GSTR – 9C

GSTR - 10

GSTR - 11

E- way Bill

Tax Invoice

Evaluation Pattern for Industry Interface Programme

CIA **60 Marks**

Daily Practical Assessment	: 30 Marks
Test I	: 10 Marks
Viva I	: 05 Marks
Test II	: 10 Marks
Viva II	: 05 Marks

ESE **40 Marks**

Record	: 10 Marks
Exam	: 20 Marks
Viva voce	:10 Marks

100 Marks

(Students will be given blank Challans and forms to fill-up)

GOODS AND SERVICES TAX (GST)

UCOM616/UCCM616/ UIAM604

Semester :VI **Credits : 5**
Category : Core XXV/XXIII **Hours/Week : 6**
Class & Major: III B.Com / III B Com CA/B.Com. (IA&T) **Total Hours : 78**

Objectives

To enable the students

- Understand the concept of GST Policy and Procedure
- Apply principle for practicing GST in the firm.
- Gain knowledge on registration procedure, levy and collection of GST

Learning outcomes:

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

- Gain working knowledge on GST and application of the same in the organizations.
- Understand and make use of knowledge of GST rules in Tax planning.
- Compute CGST, SGST, IGST and UTGST liability and Filing of returns

UNIT - I INTRODUCTION TO GST **16 Hrs**

GST - scope – Benefits – Salient features – GST Council – Important Terms - Minimal Interface – Input Tax Credit – Refund – Demands – Alternate Dispute Resolution Mechanism.

UNIT - II GST ACT **16 Hrs**

GST Act – CGST Act – SGST Act – IGST Act - UTGST Act.

UNIT - III COMPUTATION PROCEDURES FOR GST **16 Hrs**

GST - Levy & Collection of tax – Time and Value of Supply – Input Tax Credit – Registration

- Tax Invoice - Debit and Credit Notes.

UNIT - IV AUDIT AND ACCOUNTS RELATED TO GST **14 Hrs**

Administration – GST Accounts and Records – Returns – Payment of tax – Refunds- Assessment – Audit – Inspection.

UNIT - V APPEALS AND PENALTYINGST **16 Hrs**

Demand and recovery – Liability to pay tax – Advance Ruling- Seizure and arrest – Appeals and revisions – offences and penalties.

Text Books

- Datey,V.S.(2020). *All about GST.Taxmann Publications.* New Delhi.
- Vinod K Singania. (2020). *Indirect Taxes, Taxman Publications.* New Delhi.

Reference Books

- Bimal Jain & IshaBansal. (2020). *GST Law and Analysis with Conceptual Procedures.* Young Global Publications. New Delhi.
- Arpit Haldia,C.A. (2020).*GST Made Easy-Answers to All Your Queries on GST.* Taxman Publications. New Delhi.

SERVICE MARKETING

UCOM617/UCCM617/ UIAM605

Semester : VI **Credits : 5**
Category : Core XXVI/XXI **Hours/Week : 5**
Class & Major: III B.Com / III B Com CA/B.Com.(IA&T) **Total Hours : 65**

Objectives

To enable the students

- Understand about management of service marketing
- Analyze the different types of marketing of services
- Gain knowledge with regard to CRM in service marketing

Learning outcomes:

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

- Gain knowledge with regard to management of service marketing,
- Analyse the different types of marketing of services
- Enhance her knowledge with regard to CRM in service marketing.

UNIT-I INTRODUCTION **13 Hrs**

Growth of the Service Sector - Nature and Concept of Service - Classification of services - Characteristics of Services and their marketing implications.

UNIT-II SERVICE MARKETING PROCESS **13 Hrs**

Marketing strategies for service firms with special reference to information, communication, consultancy, advertising, professional services, after sales service, recruitment training and tourism. Essential Elements of marketing mix in Service marketing.

UNIT-III SERVICE MARKETING MIX **13 Hrs**

Product support services - Pricing of services - Problems of Service quality management - Customer Expectations - Innovation in services

UNIT-IV - EXTENDED SERVICE MARKETING MIX **13 Hrs**

People, Process, and physical evidence –- Nature - Types - Marketing of insurance - Mutual fund - marketing for non - profit firms - Growth of financial services in India.

UNIT-V – CRM IN SERVICE MARKETING **13 Hrs**

CRM - Identifying and Satisfying Customer needs - Relationship marketing - Customer Satisfaction - Managing Service Brands.

Text Books

- Helen Wood Ruffe. (2020). *Services Marketing*. Macmillan India. NewDelhi.
- Balaji, B. (2019). *Services Marketing and Managemen.* S.Chand & Co.New Delhi.

Reference Books

- Christopher Lovelock (2018). Services Marketing. Pearson Education. New Delhi.
- Bateson E.G., (2018). Managing Service Marketing - Text and Readings. Dryden press. Hinsdale. New York.
- Philip Kotler (2019). *Marketing Professional Services*. Prentice Hall. New Jersey. USA.
- Payne. (2019). *The Essence of Service Marketing*. Prentice Hall. New Delhi.

E-MARKETING

UCCO605 / UCOO605 / UIAO607

Semester	**: VI**	**Credit**	**: 04**
Category	**: Major Elective**	**Hours/Week**	**: 05**
Class/Major	**: III B.Com / B.Com (C.A) /** B.Com. (IA&T)	**Total Hours**	**: 65**

Objectives:

To enable the students

- Understand the importance of online marketing and its impact on traditional marketing
- Analyse the different types of e-Marketing tools
- Enhance knowledge with regard toe-CRM

Learning outcomes:

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

- Apply e-Marketing techniques to promote sales and retain customers
- Analyze and design a competitive-CRM
- Develop strategies and innovation in-Marketing

UNIT-I e—MARKETING AN OVERVIEW **12 Hrs**

Meaning, Definition, Objectives, Types, e-Malls, e-Storefront, e-Market, Features of e-Marketing, e-marketing: Scope, Benefits and Problems, e-marketing Techniques, Internet Marketing.

UNIT-IIe-MARKETING TOOLS **15 Hrs**

Objectives, e-Mail Marketing, Creating a Website, Social Media Marketing, Pay-Per- Click Advertising, Search Engine Optimization or Paid Search Engine Listing, Search Engine Marketing, Blogging and Classified Advertising

UNIT-III e-MARKETING MIX STRATEGY AND APPLICATIONS **16 Hrs**

Meaning and Objectives- 4Ps in e-Marketing, Additional 3Ps in e-Marketing of the 2P+2C+3S Formula in e-Marketing, Online Advertising, Direct Response Medium, Role of Distribution in e-Marketing.

UNIT-IV METHODS AND TECHNIQUES OF E-MARKETING **12 Hrs**

Sales Methods: Advertisements and promotion – Salesmanship and public relations. Techniques**:** Advertising Techniques, Sponsorship Techniques, Direct Marketing Techniques, Merchandising Techniques and Online Seminar Techniques.

UNIT-V e-CUSTOMER RELATIONSHIP MANAGEMENT **10 Hrs**

Meaning and Concept of e-CRM, Prerequisites for Implementation of e-CRM, Transition from CRM to e-CRM, and Customer Lifecycle, e-CRM and Community Building- Benefits: customer retention and Loyalty.

Text Books

- Judy Strauss and Raymond Frost.(2019),.*e-Marketing.* Prentice Hall. New Delhi.
- Philip Kotler. (2019). *Marketing Managemen*t. Prentice Hall. (10th ed.,). New Delhi.

Reference Books

- Ardath Albee. (2019). *e-Marketing, Strategies.* Prentice Hall, New Delhi.

- William J Stanton, Michael J Etzel, Bruce J Walker. (2019). *Fundamental of Marketin.,* Mc Graw Hill,.New Delhi.
- Cundiff and Still. (2012), Fundamental of Marketing. Pearson Publications. New Delhi.

INCOME TAX LAW & PRACTICE II

UCCO606/UCOO606/UIAO608

Semester	**: VI**	**Credit**	**: 04**
Category	**: Major Elective**	**Hours/Week:**	**05**
Class & Major	**: III B.Com/B.Com (C.A)**/B.Com(IA&T).	**Total Hours :**	**65**

Objectives:

To enable the students

- Identify the assessment procedures.
- Gain knowledge on tax savings schemes
- Apply set off and carry forward provisions.

Learning outcomes:

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

- Compute the total income and tax liability of individual assesses and firms
- File return of income tax and to take up job in filing of tax

UNIT- I COMPUTATION OF GROSS TOTAL INCOME **14 Hrs**

Clubbing of Income – Set off – Carry forward & Set off - Permissible deductions from Gross Total Income (Sec 80c to 80U).

UNIT- II COMPUTATION OF TAX LIABILITY **13 Hrs**

Schedule of Rates of Tax – Computation of Tax Liability - Assessment of Individuals- Assessment of Agricultural Income

UNIT-III ASSESSMENT OF FIRMS **13 Hrs**

Assessment of Firms – Assessment of Companies

UNIT –IV STRUCTURE OF INCOME **13 Hrs**

Income Tax Authorities – Structure of Income-tax Department-CBDT- Powers of Tax Authorities

UNIT-V PROCDEURE FOR FILLING OF INCOME TAX RETURNS **12 Hrs**

Filing of Income Tax returns-PAN-Assessment-Types of Assessment-Self assessment-best judgments assessment- Income escaping assessment - E-filing of returns-Consequences of non - Filing of returns- Procedure for Assessment.

Note-Theory - 40, Problems-

60 Text Books

- Gaur and Narang. (2020). *Income Tax Law & Practice.* Kalyani Publication. Chennai.

- Reddy & Murthy, (2020). *Income Tax Law & Practice.* Margham Publication, Chennai.

Reference Books

- Vinod K. Singhania & Kapil Singhania, (2020). Direct Taxes Law & Practice. Taxmann. New Delhi.
- Vinod K. Singhania & Monica Singhania (2020). Corporate Tax Planning & Business Tax Procedures. Taxmann Publications. New Delhi.

CONSUMER PROTECTION

UCOO607/UCCO607/UIAO609

Semester	**:VI**	**Credits**	**: 4**
Category	**: Major Elective**	**Hours/Week**	**: 5**
Class &Major	**: III B.Com / III B Com CA/ B.Com(IA&T).**	**Total Hours**	**: 65**

Objectives:

To enable the students

- Familiarise the students with their rights and responsibilities as a consumer, the social framework of consumer rights and legal framework of protecting consumer rights
- Gain knowledge about organizational setup under the Consumer Protection Act

Learning Outcomes:

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

- Understanding of the procedure of redress of consumer complaints and the role of different agencies establishing product and service standards.
- Comprehend the business firms' interface with consumers and the consumer related regulatory and business environment.

UNIT - I CONSUMER AND MARKETS **13 Hrs**

Concept of consumer, Nature of Markets: Liberalization and Globalization of markets with special reference to Indian Consumer Markets, E commerce with reference to Indian Market, Concept of price in Retail and Wholesale, Maximum Retail Price (MRP), Fair price, GST, Labeling and packaging along with relevant laws, Legal Metrology.

UNIT - II CONSUMER PROTECTION LAW IN INDIA **13 Hrs**

Consumer Rights and UN Guidelines on Consumer protection, Consumer goods, Defect in goods, spurious goods and services, service, deficiency in service, unfair trade practice, and restrictive trade practice.

UNIT - III ORGANIZATIONAL SETUP UNDER THE CONSUMER PROTECTION ACT **13 Hrs**

Advisory Bodies: Consumer Protection Councils at the Central, State, and District levels: Adjudicatory Bodies: District Forums, State Commissions, National Commission: Their Composition, Powers, and Jurisdiction (Pecuniary and Territorial), Role of Supreme Court under the CPA

UNIT - IV GRIEVANCE REDRESSAL MECHANISM UNDER THE INDIAN CONSUMER PROTECTION LAW **13 Hrs**

Grounds of filing a complaint: Limitation period: Procedure for filing and hearing of a complaint: Disposal of cases, relief/Remedy available: temporary Injunction, Enforcement of order, Appeal, frivolous and vexatious complaints; Offences and penalties.

Role of Industry Regulators in Consumer Protection

Banking: RBI and Banking Ombudsman - IRDA and Insurance Ombudsman - Telecommunication: TRAI - Food products: FSSAI - Electricity supply, Electricity Regulatory Commission - Real Estate Regulatory Authority

UNIT - V CONTEMPORARY ISSUES IN CONSUMER AFFAIRS **13 Hrs**

Evolution of consumer Movement in India, Formation of consumer organization and their role in consumer protections, misleading Advertisements and sustainable consumption , National consumer Helping, Comparative product testing sustainable consumption and energy ratings.

Quality and Standardization: Voluntary and Mandatory standards: Role of BIS, Indian standards Mark (ISI), Ag mark, Hallmarking, Licensing and surveillance: role of International standards: ISO an overview.

Text Books

- Khanna, Sri Ram, Savita Hanspal, Sheetal Kapoor, and Aswathi, (2019). *Consumer Affairs.* Universities Press. New Delhi.
- Choudhary, Ram Naresh Prasad, (2019). *Consumer Protection Law Provisions and Procedure.* Deep and Deep Publications Pvt, Ltd., New Delhi.
- Ganesan and Sumathy, (2020). *Consumer Protection in India: Issues and Challenges,* Regal Publications. New Delhi.

Reference Books

- Suresh Misra and Sapna Chadah, (2019). *Consumer Protection in India: Issues and Concern. S.Chand.* New Delhi.
- Rajalaxmi Rao. (2018). *Consumer is King.* Universal Law Publishing Company. New Delhi.
- Grimaji and Pushpa. (2019). *Consumer Rights for Everyon.* Penguin Books. UK.

E-Resources

- www.Consumereducation.in
- www.consumeraffairs.nic.in
- www.bis.org

E-ENTREPRENEURSHIP

UCCM615

Semester	**: VI**	**Credit**	**: 04**
Category	**: Core XIX**	**Hours/Week**	**: 05**
Class/Major	**: IIIB.Com (C.A)**	**Total hours**	**: 65**

Objectives:

To enable the students

- Understand the concept of e-entrepreneurship
- Identify the various e-business sites and its features
- Select entrepreneurship as a career option.

Learning outcomes:

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

- Draft a business proposal
- Establish e- business site.

UNIT-I INTRODUCTION **12 Hrs**

Meaning, definition, objectives of e-Entrepreneur, Evolution of e-Entrepreneurship, e- Entrepreneurship Vs Entrepreneurship.

UNIT-II ENTREPRENEURSHIP IN BUSINESS PLAN **13 Hrs**

e-Entrepreneurship in the business plan-Concept of Entrepreneurship- e-entrepreneurship market - e-commerce- e-market- fundamental of e-entrepreneurship, issues, opportunities and challenges in e-entrepreneurship.

UNIT-III e-BUSINESS **12 Hrs**

Creating an e-business –Components of an e-business site, additional features need for online payment - e-entrepreneurship and the law creating a mining e-business- B2B.

UNIT-IV e-CONSUMER **15 Hrs**

Meaning, definition-meaning-consumer-to-business,consumer-to-consumer(C2C) - Electronic Customer Relationship Management (E-CRM)-Advertising-Global Entrepreneurship Agreement-Guidelines-Better Business Bureau/BBB online.

UNIT-V MYTHS OF e-ENTREPRENEURSHIP **13 Hrs**

Myths of e-Entrepreneurship-common problems in e-Entrepreneurship-Entrepreneur and the Entrepreneurial Process-factors affecting e-Business Success.

Text Books

- Fang Zhao. (2019). *Entrepreneurship and Innovations in E-Business.* Idea Group publication. USA.

Reference Books

- Tobias Kollman. (2019). *E-Entrepreneurship. Foundations of Entrepreneurship in*

the Digital Economy. German Revised Edition. Germany.
- Ye-Sho Chen.(2019). *E-Entrepreneurship and Innovation in Franchising.* Louisiana State University. Baton Rouge. USA.

E-Resources

- www.igi.global.com
- www.e –entrepreneurship.in
- www. khawar.nehal @atrc.net.pk

III & IV EVALUATION COMPONENTS OF CIA

Semester	Category	Course Code	Course Title	Component III	Component IV
V	XVII/XV	UCOM506/ UCCM5 06/ UIAM501	Company Law	Case study	Seminar
VI	XXV//XXIII	UCOM616/ UCCM6 16/ UIAM604	Goods and Service Tax	Hands on training (Collecting Circulars & Notifications from the Concern Tax Department)	Problem solving
VI	XXVI/XXI	UCOM617/ UCCM6 17/ UIAM605	Service Marketing	Case Study	Seminar
VI	Major Elective	UCOO607/ UCCO6 07/ UIAO609	Consumer Protection	Poster Presentation	Seminar

COURSE PROFILE M.Phil.

(With effect from 2020-2021 batches onwards)

Semester	Paper	Category	Course Code	Course Title	Hours	Credit
I	1	Core I	MCOM106	Research Methodology	6	5
	2	Core II	MCOM104	Advanced Financial Management	6	5
	3	Core III	MCOM105	Special Area Study	6	5
	4	Core IV	MRPE101	Research and Publication Ethics	2	2
II	1	Core V	MCOD201	Dissertation & Viva-Voce		13
					Total	**30**

- Paper Presentation (minimum one) and /or
- Publication of articles in journals (minimum one) is mandatory for submission of Dissertation.

DEPARTMENT OF COMMERCE

PREAMBLE

**UG : ** Programme profile and Syllabi of courses offered in semester I and II along with III and IV evaluation components (With effect from 2020 – 2023 batch onwards) are presented in this booklet.

PROGRAMME PROFILE: B.Com.
INTERNATIONAL ACCOUNTING AND TAXATION

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 Hrs/ Week	Credit Min/ Max
I	I	Part I	UTAL105/UTAL106/ UFRL102/UHIL102	Basic Tamil – I/ Advanced Tamil – I/ French – I/Hindi - I	4	2/3
	II	Part II	UENL107/UENL108	General English -I / Advanced English- I	5	3 / 4
	III	Core I	UIAM101	Organisation Management /F1 – I	4	3/3
		Core II	UIAM102	Basics of Financial Accounting – F3	5	4/4
		Core III	UIAM103	International Accounting	5	4/4
		Allied	UMAA112	Business Mathematics	5	4/4
	IV	Value Education			2	1/1
				TOTAL	**30**	**21/23**
II	I	Part I	UTAL205/UTAL206/ UFRL202/UHIL202	Basic Tamil – II/ Advanced Tamil –II/ French – II/Hindi – II	4	2/3
	II	Part II	UENL207/UE NL208	General English II/ Advanced English II	5	3 / 4
	III	Core IV	UIAM201	Principles of Management –F1-II	4	4/4
		Core V	UIAM202	Basics of Cost Accounting/F2	5	4/4
		Allied	UCEA202	Indian Economic Development	5	4/4
		Core VI	UIAR201/ UCOR202/ UCCR202	Industry Interface Programme I- Banking and Insurance	1	1/1
	IV	Non Major Elective			4	2/2

		Soft skills			2	1/1
	V	Extension Activity/ Physical Education/NCC			-	1 / 2
				TOTAL	**30**	**22/25**
III	III	Core VII	UIAM301	Management Accounting – I /F5I	5	4/4
		Core VIII	UIAM302	International Marketing	5	4/4
		Core IX	UIAM303	Global Financial Markets	6	4/4
		Core X	UIAM304/	International Taxation	4	4/4
		Online course	-	NPTEL/ Spoken Tutorial	3	1 / 2
		Allied	UMAA301	Business Statistics	5	4/4
		Value Education			2	1/1
				TOTAL	**30**	**22/23**
IV	III	Core XI	UIAM401	Financial Reporting – I/F7- I	5	5/5
		Core XII	UIAM402	Management Accounting – II / F5 – II	5	4/4
		Core XIII	UIAM403	Business law/F4	5	4/4
		Core XIV	UIAR401/ UCOR402 /UCCR402	Industry Interface Programme II – Stock Market and Mutual Fund	1	1/1
		Core XV	UIAM405	Financial Management – I /F9 I	4	4/4
		Core XVI	UIAP501/ UCCP501/ UCOP501/ UIAM501	Project/Company Law	2	-
		Allied	UCSA407	Cyber Security in Finance	3	3/3
		Allied	UCSR413	Cyber Security – Lab	3	2/2
	IV	Soft Skills			2	1/1
	V	Extension Activity Physical Education/NCC			-	-/2
				TOTAL	**30**	**24/26**
V	III	Core XVII	UIAP501/ UCCP501/ UCOP501/ UIAM501	Project / Company Law	6	4/4
		Core XVIII	UIAM502	Financial Management –II/ F9 II	6	5/5
		Core XIX	UIAM503/ UCOM509/ UCCM509	Income Tax Law & Practice I//F6	6	5/5
		Core XX	UIAM504/ UCOM510/ UCCM510	Accounting Package	3	2/2
		Core XXI	UIAR501/ UCOR501/ UCCR501	Accounting Package – Lab	3	3/3
		Core XXII	UIAM505	Financial Reporting - II / F7 II	4	4/4
	IV	Value Education			2	1/1
				TOTAL	**30**	**24/24**

VI	III	Core XXIII	UIAM601/ UCOM612 UBAM609	Women Entrepreneurship	5	5/5
		Core XXIV	UIAM602	Audit & Assurance/ F8	6	5/5
		Core XXV	UIAR601/ UCOR602 UCCR602	Industry Interface Programme III – GST Practical	1	1/1
		Core XXVI	UIAM604/ UCCM616/ UCOM616/	Goods and Services Tax//F6	6	5/5
		Core XXVII	UIAM605/ UCOM617/ UCCM617	Service Marketing	5	5/5
		Viva Voce	UIAM606/ UCCM607/ UCOM607	Comprehensive Viva	-	1/1
		Major Elective	UIAO607/ UCOO605 UCCO605	1. E-Marketing	5	4/4
			UIAO608/ UCOO606/ UCCO606	2. Income Tax Law & Practice II//F6		
			UIAO609/ UCOO607/ UCCO607	3. Consumer Protection		
	IV	Soft skills			2	1/1
	V	Extension Activity/ Physical Education/NCC			-	-/2
				TOTAL	**30**	**27/29**
				GRAND TOTAL	**180**	**140/150**

ORGANISATION MANAGEMENT (F1-I)

UIAM101

Semester : I **Credits : 3**
Category : Core I **Hours/Week : 4**
Class& Major: I B.Com International Accounting &Taxation **Total Hours : 62**

Objectives:

To enable the students

- Understand the business and its environment.
- Gain knowledge on the framework of ethics and governance
- Analyse the factors influencing a business organisation.

Learning outcomes:

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

- Understand the types of business & the way they are structured
- Understand the role of corporate governance
- Understand the impact of external environment on the organization

UNIT– I TYPES OF ORGANISATION & STAKE HOLDER ANALYSIS **12 Hrs**

Definition and common features of business organisation, the purpose & types of organisation and their main features such as profit-oriented, not-for-profit, public sector, Co-operatives and Non-government(NGOs) - Stakeholders of an organisation – Internal &External – Objectives of stakeholders – How an organisation should satisfy these objectives – The power & interest of stakeholders in the organisation (use of Mendelow matrix)

UNIT- II EFFECT OF ENVIRONMENT ON ORGANISATION **12 Hrs**

Political & legal factors – How the policy framework of political system & legal framework influence the business organization in terms of employment, consumer protection, data security - Macro-economic factors – Understanding the effect of macro-economic policies, inflation, interest rates, unemployment, fiscal & monetary policies, global economic environment - Social & demographic factors – Impact of changes in social structure, values and demographic changes- Technological factors – Information technology – Automation, digitization

UNIT- III COMPETITION ANALYSIS **12 Hrs**

Understanding the role of competition and its impact on the business organisation, use of competition data to evaluate performance - Understand the influence of competition on business using Porter's Five Forces model-Understand the competitive position of an organisation by analysing competitive factors using SWOT analysis and Porter's Value Chain

UNIT- IV ORGANISATION STRUCTURE **12 Hrs**

The formal & informal structures –Types of structures such as entrepreneurial, functional, divisional, matrix and boundary less organisations – Suitability and relative merits &demerits of the types of organization -Principles of business governance – Separation of ownership from management. Concept of span of control-Centralization vs decentralization of business functions – Shared services approach – Off shoring & outsourcing of business functions – Hierarchical levels of business organization.

UNIT-V GOVERNANCE **14 Hrs**

Principles of corporate governance – Stewardship function of the Board- Role of committees in governance such as audit committee, remuneration committee, recruitment committee, share holders relations committee -Governance & social responsibility of an organisation – Role of ethics in business

Text Books

- Bhusan, Y.K. (2019). *Business Organisation.* Sultan Chand. New Delhi.
- GupthaC.B. (2019), *Business Management.* Sultan Chand. New Delhi.
- ACCA Study Material (2020). Kaplan Publishing. UK.

Reference Books

- Reddy, P.N and Gulshan, S.S (2019). *Principles of Business Organisation and Management.* S.Chand & Co. New Delhi.
- Shukla, M.K. (2019). *Business Organisations & Management.* S.Chand & Co. New Delhi.

BASICS OF FINANCIAL ACCOUNTING (F3)

UIAM102

Semester :I **Credits : 4**
Category :Core II **Hours/Week: 5**
Class & Major : I B.Com – International Accounting Taxation **Total Hours:65**

Objectives:

To enable the students

- Understand basic principles of financial accounting for different types of organisations.
- Exposed to the underlying concepts relating to financial accounting
- Prepare and present various financial statements.

Learning outcomes:

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

- Understand the purpose of financial accounting
- Comprehend the qualitative characteristics of financial statements
- Exhibit the use of double entry system in recording transaction
- Preparation of financial statements and the interpretation of results

UNIT –I PURPOSE OFFINANCIALACCOUNTING **13 Hrs**

Define financial accounting – Purposes of financial statements for the users – Main elements of financial reports – Conceptual framework – Definitions of asset, liability, equity, income & expenses-prudence. (International Accounting Standard Board's Conceptual Framework 2018)

UNIT – II QUALITATIVE CHARACTERISTICS OFFINANCIALSTATEMENTS **13 Hrs**

Concepts of relevance, faithful presentation, materiality, substance over form, going concern, business entity, accruals, consistency, comparability, verifiability, understandability and timeliness.(International Accounting Standard Board's Conceptual Framework 2018)

UNIT– III ACCOUNTING RECORDS & DOUBLE ENTRYACCOUNTING SYSTEM 13 Hrs

Main data sources for accounting – Different business documents such as sales order, purchase order, goods received note, quotation, goods dispatched note, invoice, credit & debit notes, receipt, remittance advice, cash vouchers – understand the double entry accounting & duality concept – types of transactions such as sales, purchases, payments & receipts**.**

UNIT- IV-RECORDING OF TRANSACTIONS 13 Hrs

Recording into journals – Ledger accounts – Balancing of ledger accounts – Accounting for discounts, sales tax – Recording cash transactions – Accounting & valuation of inventories(IAS 2 Inventory) – Accruals & prepayments – Tangible (IAS 16 Property, Plant and Equipment)&intangible assets(IAS 38 Intangible Assets) – Depreciation & amortization accounting – Receivables & payables – Provisions & contingencies (IAS 37 Provisions, Changes in Accounting Policies and Prior Period Items)– Errors & rectification – Bank reconciliation statements

UNIT – V TRIAL BALANCE, FINANCIAL STATEMENTS 13 Hrs

Statements of profit or loss and other comprehensive income, cash flow statements, balance sheet (IAS 1 Presentation of financial statements) – Events after reporting period (IAS 10 Events after the reporting date)–Interpretation of financial statements – Use of basic ratios related to profitability, liquidity, activity and resource utilization -Describe the principle of the equity method of accounting for Associate entities (IAS 28 Accounting for Associates)

Text Books

- Jain & Narang,(2020). *Financial Accounting.* Kalyani Publishers.Chennai.
- Reddy, T.S. and Murth, A.(2019). *Financial Accounting.* Margham Publication. Chennai.
- ACCA study Material. (2020). Kaplan Publishing. UK.

Reference Books

- Gupta, R.L.(2019). Advanced Accounting. Sultan Chand. New Delhi.
- Shukla & Grewal,(2019). *Advanced Accounting.* S.Chand. New Delhi.
- Antony, Hawkins and Merclant,(2019). *Accounting – Text and Cases.* Tata McGraw Hill. New Delhi.
- Steven Collins. (2020). *IFRS for Dummies.* Wiley Publications. USA.
- Frank Woods. (2018). *Business Accounting.* Volume 1 and 2. Pearson Publications. USA.

INTERNATIONAL ACCOUNTING

UIAM103

Semester :I **Credits : 4**
Category : Core III **Hours/Week: 5**
Class &Major: IB.Com International Accounting & Taxation **Total Hours : 65**

Objectives:

To enable the students

- Understand the prevailing International Accounting Systems
- Analyse the Generally Accepted Accounting Practices (GAAP) in different countries.

Learning outcomes:

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

- Understand the dimensions of international accounting
- Comprehend Country differences and Harmonization of Accounting Practices
- Analyse major Accounting Issues
- Analyse the Generally Accepted Accounting Practices (GAAP) in different countries

UNIT-I INTERNATIONAL DIMENSIONS OF ACCOUNTING 13 Hrs

Introduction – Definition – Importance-Scope of International Accounting-Status of International Accounting Education: World Scenario in India- Internationalization of the Accounting Profession: Introduction-The Accounting Profession in selected Countries-International Dimensions of Financial Reporting: Introduction Variables that influence Transnational reporting-Reporting practices- International Financing Reporting System(IFRS)-Salient Features –Need-Provisions-Applications in India-USA-UK and other Countries.

UNIT- II COUNTRY DIFFERENCES AND HARMONIZATION OF ACCOUNTING PRACTICES: **13 Hrs**

Accounting differences- Reasons for difference in National Practices– Concept of Harmonization-Need for Standardization-Impediments to Standardization- Endeavors towards Harmonization-Institution-IASC-The European Union-UN

UNIT- III INTERNATIONAL ACCOUNTING STANDARDS COMMITTEE 13 Hrs

Origins & Operations – Achievements- Current Issues-The Standards-Components and Structure of Financial Statements-Balance sheet items–Income Statement Items-Consolidated Financial Statements-Cash flow Statement-Requirements relating to particular Enterprises.

UNIT-IV COMPARATIVE ANALYSIS OF MAJOR ACCOUNTING ISSUES 13 Hrs

Legal basis of Accounting regulation-Existence of a Conceptual Frame work-Additional components of Financial Statements- General Approaches Asset Valuation-Internally Generates intangibles & Research & Development- Goodwill-Tangible Fixed Assets-Investments-Current assets-leases-Provisions-Deferred taxes.

UNIT- V ACCOUNTING DIFFERENCES & FINANCIAL STATEMENT ANALYSIS **13 Hrs**

Different approaches to Analysis-The place of Financial ratios-Factors that Generate Differences: Presentation of Financial Statements-Methods of Financing –Main problems in Financial Statement Analysis-Scope of Consolidation –Revaluation of Assets-Depreciation and Provisions-Leasing–Accounting for goodwill-Deferred Taxation –Capitalized Expenses-Transactions in Foreign Currencies-Extraordinary and Exceptional items - Changes in Accounting Principles OR Generally Accepted Accounting Practices (GAAP) India – USA-UK-Germany-France-Japan

(Only Theory)

Text Books

- Mohapatra Das, A.K. (2020). *International Accounting.* Prentice Hall of India. New Delhi.
- Rathore, Shirin. (2020). *International Accounting.* Prentice Hall of India. New Delhi.

Reference Books

- Peter Walton. (2020). *International Accounting*, International Thomson Business Press. UK.
- Saudagaran, Shahorkh. M, Cengage. (2020). *International Accounting a User Perspective*. Learning India Pvt. Ltd. New Delhi.
- Nobes Christopher & Parker Robert,(2020). *Comparative International Accounting.* Research Education Asia. New Delhi.
- Timothy Doupnik and Hector Perera. (2018). *International Accounting.* 4th Edition, McGraw-Hill Education. Chennai.

PRINCIPLES OF MANAGEMENT (F1-II)

UIAM201

Semester :II **Credit : 4**
Category : Core IV **Hours/Week: 4**
Class& Major: I B.Com International Accounting & Taxation **Total Hours: 52**

Objectives:

To enable the students

- Understand the principles of management of an organisation and management theories.
- Gain Knowledge on different managerial functions.
- Analyse business issues and achieve business objectives.

Learning outcomes:

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

- Understand strategic, managerial & operating levels of management with regard to the principles of authority, responsibility &accountability
- Understand the role of various functions of management such as R & D, sales, marketing, production, purchase, administration, finance & accounting, support services, and human resources
- Understand management functions such as planning, organising, decision-making, communicating, coordinating and control
- Understand the role of leadership with regard to different leadership styles

UNIT - I LEVELS OF MANAGEMENT IN AN ORGANISATION **10 Hrs**

Understand the functions, role and information needs of various levels of management such as strategic, middle management & operational levels – Delegation of authority – Communication – Formal & informal organization.

UNIT– II MANAGEMENT FUNCTIONS **12 Hrs**

Understand the role of different functions within an organisation such as R & D, sales, marketing, production, purchase, administration, finance & accounting, support services, and human resources – Relationship between accounting and other business functions- Outline the key features and applications of Block chain technology and distributed ledgers in accountancy.

UNIT- III FUNCTIONS OF MANAGEMENT **08 Hrs**

Understand the fundamental functions of management such as planning, organising, decision-making, communicating, and coordinating and control

UNIT- IV MANAGEMENT AND LEADERSHIP THEORIES **10 Hrs**

Management theories founded by Taylor, Fayol, Mayo, Mintzberg and Drucker - Define leadership – different types of leadership styles – Approaches to leadership referring to theories of Adair, Fiedler, Bennis, Kotter & Heifetz, Ashridge, Blake & Mouton – managing teams

UNIT - V USE OF FINANCIAL SYSTEMS AND ITS ORGANISATION MANAGEMENT **12Hrs**

Role of financial systems in the organisation with respect to data capturing, accounting and control of business - Understand the linkage between financial systems and other functions of management and departments - Understand importance of IT systems in planning, monitoring& controlling the activities of business functions - Describe cloud computing as a capability in accountancy and how it creates benefits for the organization - Explain how automation and artificial intelligence (AI) in accounting systems can affect the role and effectiveness of accountants - Describe how the application of big data and data analytics can improve the effectiveness of accountancy and audit - Define cyber security and identify the key risks to data that cyber-attacks bring.

Text Books

- Peter, F.Drucker.*(2018). The Practice of Management.* Harper Collins Publishers. USA
- Peter, F.Drucker.2013). *Management Tasks . Responsibilities and Practices.* Harper Collins. New York. USA.
- ACCA study Material, (2020). Kaplani Publishing. UK.

Reference Books

- Harold Koontz and Heinz Weihrich. (2019). *Essentials of Management.*10th Edition, Tata McGraw Hill Education, Chennai.
- Stephen, P. Robbins. (2020). *Management.* Global Edition. 14th Edition. San Diego State University. USA.
- Ricky, W.Griffin. (2019). *Management: Principles and Practices.* Tata McGraw Hill Education. Chennai.

BASICS OF COST ACCOUNTING (F2)

UIAM202

Semester :II **Credits : 4**
Category :Core V **Hours/Week : 5**
Class& Major: I B.Com – International Accounting & Taxation **Total Hours : 65**

Objectives:

To enable the students

- Understand the principles of cost & management accounting.
- Gain Knowledge on application to the management functions of planning, decision-making & control.
- Apply the cost accounting methods & techniques to various business contexts.

Learning outcomes:

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

- Knowledge and understanding of nature, purpose and scope of managerial information
- Understanding the concept of costs
- Methods of costing - absorption & marginal costing
- Use of budgets and standard costs for planning & control

UNIT - I INFORMATION FOR MANAGEMENT **13 Hrs**

Sources of data (internal & external) –Concept of cost – Cost classification based on nature of expenses, function, variability – cost behaviour with use of graphs – Concept of cost objects, cost units & cost centres- Data analysis and statistical techniques

UNIT- II ACCOUNTING FOR COSTS – MATERIAL &LABOUR **13 Hrs**

Accounting for material costs – Ordering, receiving & issuing material –Methods of valuing purchases and issues (FIFO & Weighted Average methods only) – EOQ – Inventory levels – Accounting for labour – direct & indirect cost of labour – Remuneration methods (individual & group) –Labour turnover – Overtime & idle time –Labour efficiency, capacity & volume ratios

UNIT– III ACCOUNTING FOR COSTS–OVER HEADS **13 Hrs**

Accounting for overheads – Allocation of overheads to production & nonproduction departments –Apportion service overheads to production departments -Production overhead absorption rates – Entries for accounting of material, labour & overhead costs

UNIT- IV METHODS OF COSTING **13 Hrs**

Understanding of applying job & batch costing, Process costing (including joint products & by-products, equivalent production), service costing – Understand the differences between absorption & marginal costing

UNIT- V BUDGETING &STANDARD COSTS **13 Hrs**

Understand the use of budgets and standard costs for planning & control – Flexible budgets –Reconciliation budgeted profits with actuals – Meaning & calculation of standard costs – Computation of simple variances v/s budgets & standards

Text Books

- Reddy & Murthy, (2019). *Cost Accounting*. Margham Publications. Chennai.
- Jain & Narang, (2018). *Cost Accounting.* Kalyani Publications. Ludhiana.
- ACCA study Material, (2020). Kaplan Publishing. UK.

Reference Books

- Charles, T. Horngren. (2018). *Cost Accounting- A Managerial Emphasis. (19th Edition).* Prentice Hall of India (P) Ltd, New Delhi.
- Maheshwari ,S.N. (2019). *Cost and Management Account.* Sultan Chand & Sons. New Delhi.
- Iyengar, S.P.(2019). *Cost and Management Accountancy.* Sultan Chand & Sons. New Delhi.
- Mahesh Dutta . (2018). Cost Accounting Principles and Practice. Pearson Education. USA.

INDUSTRY INTERFACE PROGRAMME I – BANKING AND NSURANCE

UIAR201/UCOR202/UCCR202

Semester :II	**Credit : 1**
Category :CoreV	**Hours /Week : 1**
Class &Major : I B. Com International Accounting & Taxation	**Totalhours : 13**

Objectives:

To enable the students

- Fill-up forms used in Banks, Insurance Companies and other business units.
- Acquire knowledge on documentation procedure.

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) DEMAT form
13) Life Insurance & General Insurance Documents
14) Challans of Non-banking Finance Companies

Evaluation Pattern for Industry Interface Programme

CIA		**60 Marks**
Daily Practical Assessment	: 30 Marks	
Test I	: 10 Marks	
Viva I	: 05 Marks	
Test II	: 10 Marks	
Viva II	: 05 Marks	
ESE		**40 Marks**
Record	: 10 Marks	
Practical Exam	: 20 Marks	
Viva voce	: 10 Marks	
Total		**100 Marks**

(Students will be given blank challans and forms to fill-up)

III & IV EVALUATION COMPONENTS OF CIA

Sem	Category	Course Code	Course Title	Component III	Component IV
I	I	UIAM101	Organisation Management (F1-I)	Assignment	Seminar
	II	UIAM102	Basics of Financial Accounting – F3	Problem solving	Assignment
II	Core III	UIAM201	Principles of Management –F1-II	Seminar	Assignment
	Core IV	UIAM202	Basics of Cost Accounting/ F2	Problem solving	Assignment

DEPARTMENT OF BIOCHEMISTRY

PREAMBLE:

UG : Programme profile and the syllabi of courses offered in semester V and VI along with III and IV evaluation Components (with effect from 2018-2021 batches onwards)

PROGRAMME PROFILE OF B.Sc BIOCHEMISTRY

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.
- Develop practical skills and strong speculative foundation in the interdisciplinary area.
- Analyze the applications of Biochemistry in the fields of Clinical Biochemistry, Genetic Engineering, Molecular Biology, Biotechnology etc.
- Expose the students to a wide range of careers that combine Biology, Plants &Medicine.

PROGRAMME PROFILE B.Sc(Biochemistry)

Semester	Part	Category	Course Code	Course Title	Previous Course Code	Hours Per Week	Credit Min / Max
I	I	Language	UTAL105/ UTAL106/ UHIL102/ UFRL102	Basic Tamil I/ Advanced Tamil I/ Hindi I / French I	UTAL103/ UTAL104/ UHIL101/ UFRL101	4	2/3
	II	English I	UENL107 /UENL108	General English I/ Advanced English I	- / UENL106	5	3/4
	III	Core I	UBCM106	Fundamentals of Biochemistry	--	2	1
		Core II	UBCM105/	Cell Biology	UBCM201	6	5
		Core Practical I	UBCR101	Cell Biology Practical	--	3	3
		Allied I	UCHA102	Allied Chemistry - I	UCHA101	5	4
		Allied Practical	UCHR103/ UCHR403	Volumetric and Organic Analysis	--	3	2
	IV	Value Education				2	1
					TOTAL	**30**	**21/23**
II	I	Language	UTAL205/ UTAL206/ UHIL202/ UFRL202	Basic Tamil II/ Advanced Tamil II/ Hindi II/ French II	UTAL203/ UTAL204/ UHIL201/ UFRL201	4	2/3
	II	English II	UENL207/ UENL208	General English II/ Advanced English II	- / UENL206	5	3/4
	III	Core III	UBCM202	Biomolecules	UBCM102	5	5
		Core Practical II	UBCR201	Qualitative Analysis of Biomolecules	--	3	2
		Allied II	UMBA201	Microbiology	--	4	4

		Allied II Practical	UMBR201	Microbiology Practical	--	3	3
	IV	Non Major Elective				4	2
		Soft Skill				2	1
	V	Extension Activity/ Physical Education/NCC				-	½
					TOTAL	**30**	**23/26**
III	I	Language	UTAL307/ UTAL308/ UHIL302/ UFRL302	Basic Tamil III/ Advanced Tamil III/ Hindi III/ French III	UTAL303/ UTAL304/ UHIL301/ UFRL301	4	2/3
	II	English III	UENL307/ UENL308	General English III/ Advanced English III	- / UENL306	5	¾
	III	Core IV	UBCM304	Biochemical Techniques	--	6	6
		Core Practical III	UBCR301	Biochemical Techniques practical I	--	5	5
		Allied III	UMAA305	Biostatistics	UMAA405	5	4
	IV	Online Course		NPTEL/Spoken Tutorial		3	½
		Value Education				2	1
					TOTAL	**30**	**22/25**
IV	I	Language	UTAL405/ UTAL406/ UHIL402/ UFRL402	Basic Tamil IV/ Advanced Tamil IV/ Hindi IV/ French IV	UTAL403/ UTAL404/ UHIL401/ UFRL401	4	2/3
	II	English IV	UENL407/ UENL408	General English IV/ Advanced English IV	-- / UENL406	5	¾
	III	Core V	UBCM403	Immunology	UBCO603	6	6
		Core VI	UIDM401	Pharmaceutical Chemistry	UIDM401	6	6
		Core Practical IV	UBCR401	Biochemical Techniques Practical II	UBCR401	5	5
		Core X	UBCP501	Project	UBCP601	2	-
	IV	Soft skill				2	1
	V	Extension Activity/ Physical Education/NCC				-	- /2
					TOTAL	**30**	**23/27**
V	III	Core VII	UBCM504	Enzymes & Intermediary Metabolism	UBCM501	6	6
		Core VIII	UBCM505	Human Physiology	UBCM502	6	6
		Core IX	UBCM506	Basics of Bioinformatics	UBCM503	6	6
		Core Practical V	UBCR501	Enzymology Practical	UBCM501	6	3
		Core X	UBCP501	Project	UBCP601	4	4
		Value Education				2	1

					TOTAL	**30**	**26**
VI	III	Core XI	UBCM605	Introduction to Biotechnology	UBCM601	5	4
		Core XII	UBCM606	Clinical Biochemistry	UBCM602	5	5
		Core XIII	UBCM607	Molecular Biology	UBCM603	5	5
		Core 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	UBCO604	Stem Cell Biology	--	5	4
			UBCO607	Molecular Endocrinology	UBCO605		
			UBCO606	Pathobiology of Human Diseases and Disorders	--		
			UIDM601	Nanotechnology in Medicine	--		
	IV	Soft Skill				2	1
	V	Extension Activity/ Physical Education/NCC				-	-/2
					TOTAL	**30**	**25/27**
					GRAND TOTAL	**180**	**140/154**

Experiential Learning for Clinical Biochemistry and Biotechnology Offered in Semester VI

Course Mapping				**Collaborating Agency –MSME & E.S. Hospital**		
Semester	**Course Code**	**Course Title**	**Assessment**	**Course Title**	**Hours/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

ENZYMES AND INTERMEDIARY METABOLISM

UBCM504

Semester : V	**Credits : 6**
Category : Core VII	**Hours/Week : 6**
Class &Major: III B.Sc Biochemistry	**Total Hours : 78**

Objectives:

To enable the students

- Understand the rate of acceleration of the biochemical reactions in the presence of the biocatalyst (enzymes).
- Elucidate how enzymes catalyze the bio chemical reactions.
- Analyze the importance of biochemical metabolic pathways.

Learning Outcomes:

On Completion of the course, the students will be able to

- Acquire fundamental knowledge on enzymes and their importance in biological reactions.
- Understand the difference between a chemical catalyst and biocatalyst.
- Understand the importance of high energy compounds, electron transport chain and synthesis of ATP under aerobic and an aerobic conditions.
- Exposed with the fact that perturbations in the carbohydrate, lipid, protein and nucleic acid metabolism that lead to various disorders.

UNIT-I INTRODUCTION **16 Hrs**

Enzymes - Introduction; Nomenclature and IUB Classification of Enzymes, Enzyme Units, Coenzymes and Isoenzymes. Active Site: Mode of action - Lock and Key theory and Induced fit theory. Factors influencing enzyme action, Michaelis Menten equation: Line weaver burke plot: Eadie – Hofstee plot; Enzyme Inhibition – Competitive, Non – Competitive and Uncompetitive Inhibition.

UNIT-IICARBOHYDRATE METABOLISM **16 Hrs**

Glycolysis - Aerobic and anaerobic pathway, Oxidation of Pyruvate, TCA cycle and its energetics - Anaplerotic reactions; Regulation, Gluconeogenesis, Glycogenesis, Glycogenolysis – pathway and Regulation. Pentose phosphate pathway.

UNIT-III LIPID METABOLISM **15 Hrs**

Biosynthesis of Fatty acid. Oxidation of Fatty acids - α, β and γ oxidation; Biosynthesis and Degradation of Lecithin, Cephalin, Phospatidlyl Inositol, Phosphatidyl Serine, Sphingomylin and Plasmalogen. Biosynthesis and Degradation of Cholesterol.

UNIT-IV PROTEIN METABOLISM **16 Hrs**

Fate of Dietary Proteins. Catabolism of Aminoacids –Transamination, Oxidative and non-Oxidative Deamination, Transdeamination, Decarboxylation, Urea cycle and its Regulation and Biosynthesis of Creatinine.

UNIT-V NUCLEICACID METABOLISM **15 Hrs**

Metabolism of Purines - Biomedical importance. Biosynthesis of Purine Nucleotides by De novo and Salvage Pathway, Regulation and Degradation, Metabolism of Pyrimidines – Biosynthesis of Pyrimidine Nucleotides by De novo and Salvage pathway and Degradation.

Text Books

- David L. Nelson, Michael M.Cox. (2017). *Lehninger-Principles of Biochemistry*. W.H.Freeman and company. (7^{th} ed.,). Newyork
- Robert, K & Murray.et.al, (2015). *Harpers Biochemistry*. Prentices Hall International. (30^{th} ed.,).

Reference Books

- Trevor Palmer. (2001).*Understanding Enzymes*. Scientific Publishers. Jodhpur (5^{th} ed.,)
- Voet &Voet, John Wiley & Sons, (2018). *Biochemistry*. Prentices Hall International.(5^{th} ed.,)
- Champe, P.C and Richard A Harvey. (2017). *Lippincotts Biochemistry*. Williams & Wilkins Publishers. (7^{th}ed.,).

E-Resources

- https://www.kobo.com/us/en/ebook/enzymes-6
- https://www.elsevier.com/books/the-enzymes/dalbey/978-0-12-373916-2
- https://www.kobo.com/us/en/ebook/metabolic-regulation
- https://www.kobo.com/us/en/ebook/hepatic-de-novo-lipogenesis-and-regulation-of-metabolism
- https://www.elsevier.com/books/metabolic-regulation/vogel/978-0-12-299255-1

HUMAN PHYSIOLOGY
UBCM505

Semester : V	**Credits : 6**
Category : Core VIII	**Hours/Week : 6**
Class &Major: III B.Sc Biochemistry	**Total Hours : 78**

Objectives:
To enable the Students

- Understand the physical structure and functioning of human body.
- Analyze the importance of human & human organs.
- Comprehend the functional organization of organ system of human body in the study of Biochemistry.

Learning Outcomes:
On Completion of the course, the students will be able to

- Explain the structure and functions of human organs and organ systems.
- Indentify causes and effects of homeostatic imbalance
- Exposure with the blood and circulatory system and the function of heart.
- Exposure with the process of gaseous exchange in tissues and lungs, respiratory adaption to high altitude.

UNIT - I BLOOD AND CIRCULATORY SYSTEM **15 Hrs**

Blood and Body fluids- Composition and Functions; Types of Blood Cells- Morphology and Function; Blood coagulation; Blood groups- ABO and Rhesus System. Circulation: Structure of Heart and Blood Vessels, Cardiac Cycles- Cardiac Factors Controlling Blood Pressure- Electrocardiogram- Functions of Heart.

UNIT - II DIGESTION & EXCRETORY SYSTEM **15 Hrs**

Structure and Function of different components of Digestive System, Mechanism of Digestion and Absorption of Carbohydrates, Lipids and Proteins, Gastric Secretion - Mechanism of HCl formation in Stomach. Kidney structure and its organization, Mechanism of Urine Formation- Glomerular Filtration Rate (GFR), Selective Reabsorption (active and passive) of substances and Secretion

UNIT –III RESPIRATION **16 Hrs**

Components of the respiratory system; Diffusion of gases in Lungs- Transport of oxygen from Lungs to Tissues, Transport of CO_2 from Tissues to Lungs.

UNIT – IV NERVOUS SYSTEM **16 Hrs**

Central Nervous System- General organization. Functional Units. Resting and Action potential- Conduction of Nerve Impulse, Structure of Synapses, Synaptic transmission; Structure of Neuromuscular Junction and Mechanism of Neuromuscular transmission, Neurotransmitters. Biochemical aspects of learning and memory.

Encephalin and Endorphins.

UNIT – V MUSCULAR SYSTEM **16 Hrs**

Types of Muscles and their Functions; Structure of Skeletal Muscle, Myosin, Actin and Regulatory proteins, Sarcomere unit, Mechanism of Contraction and Relaxation of Skeletal Muscles; Chemical changes during Muscle Contraction, Source of energy for Muscle Contraction.

Text Books

- Chatterjee, C.C . (2018). *Human Physiology*: Vol I & II. (12thed.,).
- Sembulingam, K and Prema Sembulingam. (2019). *Essentials of Medical Physiology*. Jaypee Brothers. (8thed.,).New Delhi.

Reference Books

- Guyton & Hall. (2010).*Textbook of Medical Physiology*. Reed Elsevier India Private Limited. (12thed.,).New Delhi.
- Murray et al., (2012).*Harper's Physiological Biochemistry*. Tata McGraw Hill Publication. Co. Limited. (29thed.,).New Delhi.
- Guyton, A.C.(1974). *Functions of the Human body*.

E-Resources

- https://openstax.org/details/books/anatomy-and-physiology
- https://open.umn.edu/opentextbooks/textbooks/anatomy-and-physiology
- https://oer.galileo.usg.edu/cgi/viewcontent.cgi?article=1004&context =biology- collections
- https://opentextbc.ca/anatomyandphysiology/
- https://libguides.com.edu/c.php?g=649894&p=4556867

BASICS OF BIOINFORMATICS

UBCM506

Semester	**: V**	**Credits**	**: 6**
Category	**: Core IX**	**Hours/Week**	**: 6**
Class &Major	**: III B.Sc Biochemistry**	**Total Hours**	**: 78**

Objectives:

To enable the students

- Understand the basics concepts of Bioinformatics and its significance in Biological data analysis.
- Classify different types of Biological databases.
- Overview about the biological macromolecular structures.

Learning Outcomes:

On Completion of the course, the students will be able to

- Explain the concepts of biology in computer science and mathematics using software to extract relevant information from large database.
- Assess the interface between Computational and Biological Science.
- Apply the Bioinformatics tools in Research

UNIT - I INTRODUCTION TO BIOINFORMATICS **12 Hrs**

Bioinformatics- An overview and definition, Objectives and Scope-Genomics, Proteomics and Computer aided Drug Design. Bioinformatics and Internet – Challenges and Applications. Bioinformatics Programmes in India

UNIT - II BIOLOGICAL DATABASE AND ITSTYPES **12 Hrs**

Introduction to Data types and Source. General Introduction of Biological Database; Nucleic acid databases-NCBI, DDBJ, SWISS-PROT and EMBL. Protein information resources - Biological databases, Protein databases – Primary, Composite and Secondary. Specialized Genome databases, TIGR and ACeDB, Structure databases – CATH, SCOP and PBD sum. String Database

Lab demo class-NCBI, EMBL and DDBJ **09 Hrs**

UNIT - III DNA SEQUENCE ANALYSIS **12 Hrs**

DNA sequence Analysis - DNA Sequence, Features of DNA sequence analysis, EST- differential approaches to EST analysis and c-DNA libraries.

UNIT – IV SEQUENCE ALIGNMENT **12 Hrs**

Pair wise alignment – Database searching (Needleman algorithm)- Comparing two sequences - Identity and Similarity, FASTA and BLAST, Multiple sequence alignment - Definition - ClustalW.

Lab demo class- FASTA, BLAST and ClustalW **09 Hrs**

UNIT – V BIOINFORMATICS APPLICATIONS 12 Hrs

Perl/Python for Bioinformatics: Basic concepts and application in Biological Sequence analysis. Bioinformatics tools for Primer designing and checking.

Text Books

- Attwood ,T.K and D.J Parry.(2014). *Introduction to Bioinformatics*. Pearson Education Ltd. New Delhi.
- N. Gautham, (2018). *Bioinformatics-Database and Algorithm*. Narrosa publishing house.

Reference Books

- Andreas, D Baxevanis and Francis Quellette, B F. (2016). *Bioinformatics- A Practical guide to the analysis of genes and proteins*. Willey publication. New Delhi.
- Arthur, M. Lesk. (2013). *Introduction to Bioinformatics*. Oxford university press. (4^{th}ed.,).UK .
- Jerry Gu, Phlip E Bowrne. (2009). *Structural Bioinformatics*. Willey- Blockwell publication. New Delhi.

E- Resources

- www.aun.edu.eg/.../Procedure%20Bioinformatics22.../Xiong%20-%20Es...
- www.iasri.res.in/ebook/CAFT_sd/Concepts%20of%20Bioinformatics.pdf
- goldenhelix.com/.../ebooks/Teaching-Bioinformatics-Concepts-Practical
- www.Bioinformatics.org
- www.bioinfo.mbb.yale.edu/mbb452a/intro/
- www.biology.ucsd.edu/others/dsmith/Bioinformatics.htm

ENZYMOLOGY PRACTICAL

UBCR501

Semester : V **Credits : 3**
Category : Core Practical V **Hours/Week: 6**
Class & Major: III B.Sc Biochemistry **Total Hours : 78**

Objectives:

To enable the Students

- Understand enzyme activity
- Develop technical competence with respect to kinetics of specific enzymes
- Inculcate the ability to engage in critical enquiry.

Learning Outcomes:

On Completion of the course, the students will be able to

- Aware of the influence of enzyme structure on catalytic properties
- Understand the chemical principles of enzyme catalysts, including Cofactor Chemistry.
- Analyze the action of enzymes as biocatalysts and in factors that influence enzyme activity.

Exercises

1. Assay of Salivary Amylase activity
2. Effect of pH on Salivary Amylase activity
3. Effect of Temperature on Salivary Amylase activity
4. Effect of Substrate Concentration on Salivary Amylase activity
5. Assay of Urease activity
6. Effect of pH on Urease activity
7. Effect of Temperature on Urease activity
8. Effect of Substrate Concentration on Urease activity
9. Assay of Serum Alanine Transaminase activity
10. Assay of Serum Alkaline Phosphatase activity
11. Assay of Serum Aspartate Transaminase activity

Text Books

- David, T. Plummer. (1999). *An Introduction to practical Biochemistry.* (3rd revised ed.,).
- Jayaraman, J. (2011). *Laboratory Mannualin Biochemistry.* New Age international limited publication.

Reference Books

- Pattabiraman. (2015). *Laboratory Manual in Biochemistry* (4thed.,).
- Singh .S.P.(2013). *Practical Manual of Biochemistry.* CBS Publication .(6th ed.,).

E-Resources

- https://www.worldcat.org/title/practical-enzymology/oclc/827358447
- https://onlinelibrary.wiley.com/doi/book/10.1002/9783527659227
- https://www.kobo.com/us/en/ebook/practical-enzymology
- https://books.google.co.in/books/about/Practical_enzymology.html?id=dxZrAA AAMAA J&redir_esc=y
- https://www.amazon.in/Practical-Enzymology-Hans-Bisswanger-ebook/dp/B00DOX8ESA

PROJECT
UBCP501

Semester	**: V**	**Credits**	**: 4**
Category	**: Core X**	**Hours/Week**	**: 4**
Class & Major:	**III B.Sc Biochemistry**	**Total Hours**	**: 52**

Objectives:
To enable the students

- Acquire knowledge in life science research.
- Develop problem solving and decision making skills.

Learning Outcomes:
On Completion of the course, the students will be able to

- Identify practical problem, Solve using the laboratory techniques and Biochemistry underpinning the set experiment.
- Provide students a hands-on experience of Designing, Performing, and Analyzing results from a Molecular Biology/Biochemical mini-project.
- Acquire effective knowledge in experiential learning for the students which plays a key role in bridging the gap between industry and Academia.

Guidelines

- Mini project is offered for final year B.Sc Biochemistry students in Semester VI.
- Project can be done according to area of interest
- Project should do either as individual or as group with maximum of three /four students.
- Project can be field study, survey, experimentation, extraction of components from medicinal plants and waste water treatment.
- Evaluation scheme for the project will be Internal 60 and External40.

Assessment

S. No	Internal		External	
	Component	**Marks**	**Component**	**Marks**
1	Review of the Literature	10	Dissertation	10
2	Area of Research	10	Presentation	20
3	Methodology	10	Viva - voce	10
4	Accuracy of result	10		-
5	Result and Discussion	10		-
6	Report preparation	10		-
	Total	**60**		**40**
	Maximum marks	100		

INTRODUCTION TO BIOTECHNOLOGY

UBCM605

Semester : VI **Credits : 4**
Category : Core Paper XI **Hours/Week : 5**
Class & Major: III B.Sc Biochemistry **Total Hours : 65**

Objectives:
To enable the students

- Understand the Recombinant DNA technology and its methods.
- Application of various Molecular Biology techniques.
- Analyze the scope of Biotechnology in plant and animal cell line.

Learning Outcomes:
On Completion of the course, the students will be able to

- Comprehend about the introduction & tools of Genetic Engineering.
- The scope in agriculture, medicinal &environment.
- Identify the techniques used for separation & isolation of molecules.

UNIT - I TOOLS OF GNETIC ENGINEERING **12 Hrs**

Introduction to Recombinant DNA technology -Restriction Enzymes, Ligases, Modifying Enzymes - Cloning Vectors: Plasmid, Phagemid, Cosmid, cDNA Clone Bank. Cloning Strategies-Screening and selection of Recombinants- Positive and negative stain

UNIT - II METHODS OF GENE TRANSFER **15 Hrs**

Gene Transfer Mechanism - Physical, Chemical and Biological methods. Gene Recombination and Gene transfer: Bacterial Conjugation- Transformation,

Transduction- Microinjection- Electroporation- Microprojectile- Shot Gun method- Ultrasonication- Liposome fusion.

UNIT – III PLANT BIOTECHNOLOGY **13 Hrs**

Plant Tissue Culture – Basic of Plant Tissue Culture, Plant Hormones – Their role in development of plant – Transgenic Plants - Herbicide resistance, Virus Resistance and Pest resistance. GMO's

UNIT – IV ANIMAL BIOTECHNOLOGY **15 Hrs**

Introduction to Cell Culture, Cryopreservation, Applications of Cell Culture. Culture Environment, Adherent Vs Suspension Culture, Cell Culture Laboratory, Cell Culture Equipment. Bioreactors and its applications. Transgenic animals and its applications

UNIT - V MOLECULAR BIOLOGY TECHNIQUES IN BIOTECHNOLOGY **10 Hrs**

Principles and techniques of Nucleic Acid- Hybridization, Northern, Southern and Western Blotting, Polymerase Chain Reaction(PCR), DNA Fingerprinting, Molecular Markers- Restriction Fragment length Polymorphism (RFLP) and Random Amplified Polymorphic DNA(RAPD).

Text Books

- Primrose. (1991). *Biotechnology. Black well Publishing house.* (2nd revised ed.,).
- Dubey R.C. (2014). *A text book of Biotechnology.* S.Chand Publications. (5th revised ed.,).

Reference Books

- Brown, T.A .(2016). *Gene Cloning and DNA Analysis*. Blackwell Publishing Co. (7th ed.,)
- Jack,W.Christian Maryland,(2006). *Biotechnology–Theory and techniques of plant biotechnology. Animal cell culture & immunobiotechnology*. CBS Publishers.
- John E Smith. (2012). *Biotechnology*. Cambridge University Press. (5th ed.,).

E-Resources

- www.springer.com/la/book/9781617799822
- www.freebookcentre.net › Medical Books
- www.indiabiotech.in/Free-e-Books-Journals.html
- nptel.ac.in.
- http://www.thanut-swu.com/images/BOT101/BiotechnologyBook.pdf

CLINICAL BIOCHEMISTRY
UBCM606

Semester : VI | **Credits : 5**
Category : Core Paper XII | **Hours/Week : 5**
Class & Major: III B.Sc Biochemistry | **Total Hours : 65**

Objectives:
To enable the students

- Understand the diagnostic and therapeutic methodologies available for selective diseases.
- Appraise the various clinical laboratory tests.
- Evaluate the effective information to correlate with clinical diagnostics.

Learning Outcomes:
On Completion of the course, the students will be able to

- Understand the good Clinical Laboratory Practices and the skills to be developed.
- Acquire in-depth knowledge on diseases and disorders in human life.
- Learn about the normal constituents of urine, blood and their significance in maintaining good health.
- Exposure to the mechanisms of causation of diseases of Liver and Kidney.
- Develop understanding of the current concepts related to mechanism of Cancer.
- Acquire knowledge on various diagnostic methods for renal, hepatic, pancreatic functions

UNIT - I INTRODUCTION TO CLINICAL BIOCHEMISTRY **14 Hrs**

Organization of Clinical laboratory, Introduction to Instrumentation and Automation in Clinical Biochemistry laboratories safety regulation and First aid. General comments on specimen collection, Types of specimens for Biochemical analysis. Reference ranges for clinical laboratory tests. Eligibility and personal skills required for clinical Biochemistry.

UNIT - II GLUCOSE HOMEOSTASIS-COMPLICATIONS, DISORDERS **13 Hrs**

Glucose homeostasis, Diabetes mellitus, hypoglycemia, metabolic complications, GTT and its Significance- Glycosylated Hb-Glycosuria- Glycogen storage diseases, Galactosemia- Fructosuria- Ketoacidosis.

UNIT - III LIPIDS-DISORDERS **13 Hrs**

Hypo and Hyperlipoproteinemias, Lipidosis, Fatty liver, Obesity and Cardio vascular diseases- Hypertension-Atherosclerosis- Myocardial Infarction-Congestive Heart Failure.

UNIT - IV INBORN ERRORS OF METABOLISM **12 Hrs**

Clinical manifestation of Phenylketoneuria, Tyrosinemia, Alkaptonuria, Homocysteineuria, Cysteinuria, Cystenosis, Maple syrup urine disease, Hartnups disease and Gout.

UNIT - V DIAGNOSTIC METHODS **13 Hrs**

Assessment and Clinical manifestation of Renal, Hepatic, Pancreatic Functions-RFT, LFT.Water and Electrolyte Balance and Imbalance. Jaundice and its types.

Text Books

- Shaun ,C A Anderson, Suncokayne, S A. (2015).*Clinical Chemistry concepts and applications*. CBS Publishers. New Delhi.
- Vasudevan (2019). *Text book of Medical Biochemistry*. ViJaypee Brothers *Medical Publishers* (P) Ltd.. (9^{th}ed.,).

Reference Books

- Harold Varley. (2006). *Practical Clinical Biochemistry*.CBS Publishers.(6^{th} ed.,).New Delhi
- Bhagavan N.V. (2001). *Medical Biochemistry*. Fourth edition. Academic Press (4^{th} ed.,).
- Victor,W Rodwell, David A Benda, Kathean M,Botham. (2015). *Harpers illustrated Biochemistry*. MC Graw Hill Education (13^{th} ed.,).

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
- http://web.mef.hr/web/images/pdf/i_clin_bioch.pdf
- https://www.worldscientific.com/worldscibooks/10.1142/7126

MOLECULAR BIOLOGY
UBCM607

Semester : VI **Credits : 5**
Category : Core Paper XIII **Hours/Week : 5**
Class & Major: III B.Sc Biochemistry **Total Hours : 65**

Objectives:
To enable the students

- Understand the history and scope of Molecular Biology.
- Acquire working knowledge of gene &to know how genes are expressed.
- Appreciate how genetic engineering & biotechnology influence a health care in the next century.

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

- Study the discovery of DNA as genetic material, DNA Replication, Transcription, DNA Repair and Translation.
- Analyze coding and non-coding regions of prokaryotic genome and their importance.
- Understand the fundamentals of DNA damage and repair, including types of mutation & repair mechanisms.

- Exposure with the importance of E. coli Lac Operon, PCR, expression vectors and their importance in Biotechnology.

UNIT-I INTRODUCTION **13 Hrs**

History of Molecular Biology- Discovery of DNA -Experimental evidence to prove DNA as a carrier of Genetic material-Bacterial Transformation, Transduction and Conjugation. Replication - Evidence to show DNA Replication is Semi Conservative; Messelson and Stahl experiment. DNA Replication in Prokaryotes -Types.DNA repair mechanism.

UNIT-II TRANSCRIPTION **14 Hrs**

Transcription in Prokaryotes: Central Dogma, DNA dependent RNA Polymerases, Mechanism - Various sites of Transcription, rho dependent and independent termination. Post transcriptional modification-mRNA, rRNA and tRNA processing. RNA Splicing, editing. Inhibitors of Transcription, Eukaryotic RNA Polymerases. Reverse transcription.

UNIT-III GENETIC CODE AND TRANSLATION **13 Hrs**

Genetic Code-Definition, deciphering of the Genetic Code, Codon Dictionary, salient features, Experimental evidences, Wobble Hypothesis. Translation in Prokaryotes Initiation, Elongation, Translocation, Termination, Post translational modification. Protein targeting

UNIT-IV OPERON **13 Hrs**

Operon model - Lac operon positive and negative control, repression and attenution (Trp operon), Recombination, Gene amplification.

UNIT-V GENE AND CHROMOSOME MUTATION **12 Hrs**

Mutation- Base pair substitution- Frame shift mutation- Missense mutation, nonsense mutation- Mutation in termination codons- Silent mutation- Chromosome mutation.

Text Books

- David, L.Nelson. (2005). Michael M.Cox,*Lehninger -Principles of Biochemistry.* W.H.Freeman and Company. (4th ed.,). Newyork
- David Freifelder. (2004).*Molecular cell Biology*.Narosa publishing house New Delhi.

Reference Books

- Karp,G. (2005). *Cell and Molecular Biology*. Willey International edition (4th ed.,).
- Harvey Lodish, David Baltimore, Adrenold berk, S.Lawrence Zipursky, Paul Matsudaira, James Darnell, (2015). *Molecular Cell Biology*. W.H.Freeman & Company. (5thed.,). New York .
- Twyman, R.M. (2001). *Advanced Molecular Cell Biology*. W.WisdenViva books private Ltd. New Delhi.

E-Resources

- http://www.freebookcentre.net/Biology/Molecular-Biology-Books.html
- https://www.amazon.in/Molecular-Biology-N-Vidyavathi-ebook/dp/B078KWF9BN

- https://pothi.com/pothi/book/ebook-kaushlendratripathi-introduction-molecular- biology
- https://www.worldcat.org/title/molecular-biology/oclc/1062496183
- https://www.us.elsevierhealth.com/medicine/molecular-biology

CLINICAL BIOCHEMISTRY-PRACTICAL
UBCR601

Semester : VI **Credits : 3**
Category : Core Practical VI **Hours/Week : 5**
Class & Major: III B.Sc Biochemistry **Total Hours : 65**

Objectives:
To enable the students

- Develop good Clinical practice of Diagnostic Biochemical tests.
- Develop competence and confidence in the associated calculation skills.
- Understanding of the basic Principles of Clinical Analysis.

Learning Outcomes:
On completion of the course, the students will be able

- Analyze the appropriate specimen collection procedures, staining methods, and Biochemical techniques used in the laboratory.
- Acquire practical training for qualitative and quantitative analysis of biological materials/molecules such Glucose, Cholesterol, Protein, Urea, Uric acid, Creatinine, Phosphorus, etc. and their estimation using multiple methods
- Perform and interpret Body fluid tests, detect abnormalities, assign a diagnosis and prescribe follow-uptesting.

Colorimetric Estimations:

1. Estimation of Blood Glucose by
   a) Folin's Wu method
   b) Ortho Toluidine method
2. Estimation of Cholesterol by Zak'smethod
3. Estimation of Creatinine by Jaffe's method.
4. Estimation of Urea by Diacetyl monoxime method.
5. Estimation of Albumin/Globulin ratio in serum.
6. Estimation of DNA by Diphenylamine method
7. Estimation of RNA by Orcinol method
8. Estimation of Bilirubin by Malley Evelyn method.
9. Estimation of Protein by Biuret method.
10. Estimation of Inorganic Phosphorous by Fiske and Subbarrow method.

Text Books

- Harold Varley.(2005). *Practical Clinical Biochemistry*. CBS Publication.
- Shirish , M. Kawthalkar. (2018). *Essentials of Clinical Pathology*. Paperback.

Reference Books

- Chatterjea, RanaShinde. (2008). *Textbook of Medical Biochemistry*. Jaypee publication.
- Chawla, Ranjna. (2014). *Practical Clinical Biochemistry.* Jaypee Publisher.(3rd ed.,).
- Saini, A.S. (2011). *Clinical Biochemistry in Diagnosis &Management*. B. S Publishers (1st ed.,).

E-Resources

- https://books.google.co.in/books/about/Fundamentals_of_Practical_Clinical_Bi och.html d=oqrOT5xnbekC&redir_esc=y
- https://in.pinterest.com/pin/746049494494648558/
- http://clinicalbiochemistryupdates.blogspot.com/2010/01/biochemistry-ebook-links-free-download.html
- https://books.google.co.in/books/about/Practical_Clinical_Biochemistry.html?id =HP2YA wAAQBAJ&redir_esc=y
- https://www.amazon.in/Basic-Concepts-Clinical-Biochemistry-Practical-ebook/dp/B07BTJ12SR

HEMATOLOGY AND URINE ANALYSIS

UBCR602

Semester	**: VI**	**Credits**	**: 2**
Category	**: Core Practical VII**	**Hours/Week**	**: 3**
Class & Major:	**III B.Sc Biochemistry**	**Total Hours**	**: 39**

Objectives:

To enable the students

- Understand good clinical practice of various diagnostic biochemical tests.
- Evaluate different test and procedures related to clinical lab.

Learning Outcomes:

On completion of the course, the students will be able

- Demonstrate the theoretical knowledge and technical skills in the performance of routine Clinical laboratory testing
- Distinguish normal and abnormal microscopic characteristics of Blood cells through performance of a complete Blood count.

1. Hematology

- RBC Count
- Total and differential WBC count
- PCV

- ESR
- Hemoglobin.

2. Urine Analysis

I. Qualitative analysis of normal and abnormal constituents of Urine (Sugar, Protein, Aminoacids, Ketone bodies, Bile salts, Bile pigments, Bence jones protein)

II. Quantitative estimations in urine
    - Glucose by Benedict' smethod.
    - Urea by Diacetyl Monoxime Method.
    - Creatinine by modified Jaff's method.

Text Books

- Varley. (2005).*Practical Biochemistry.*CBS Publishers.
- Sawhney, S. K, Randhir Singh. (2011).*Introductory practical Biochemistry.* Narosa Publishing House.

Reference Books

- Rajagopal, G,Toora, BD. (2014). *Practical Biochemistry for medical Dental and Allied Course.* Ahuja Publishing House. (3rd ed.,).
- Kanai, L Mukherjee. (2004). *Medical Laboratory Technology.* Tata Mc GRAW-Hill publishing company Limited. (15th ed.,).
- David T Plummer.(2004). *An Introduction to Practical Biochemistry.* Tata Mc GRAW- Hill Publishing Company Limited.(15th ed.,).

E-Resources

- https://www.researchgate.net/publication/284722237_Laboratory_Manual_and_Review_on_Clinical_Pathology.
- https://www.academia.edu/36985667/Dacie_and_Lewis_Practical_Haematology
- http://vetbooks.ir/laboratory-urinalysis-and-hematology-for-the-small-animal-practitioner/
- http://uploads.worldlibrary.net/uploads/pdf/20150424022016laboratory_feb14.pdf
- http://medsoulsmedicine.com/clinical-pathology-hematology-and-blood-banking-for-dmlt-students-3e-true-pdf/

STEM CELL BIOLOGY
UBCO604

Semester : VI | **Credits : 4**
Category : Major Elective | **Hours/Week : 5**
Class &Major: III B.Sc Biochemistry | **Total Hours : 65**

Objectives:

To enable the students

- Understand physiology of stem cells at cellular level.
- Understand the culture of stem cells.
- Identify the diagnosis and management of diseases and disorders with stem cells

UNIT –I INTRODUCTION TO STEM CELLS **15 Hrs**

Stem cell definition, kinds of stem cells - Embryonic and adult stem cells. Characteristics of stem cells. Totipotent, Unipotent, oligopotent and pluripotent cells.

UNIT- II GROWTH INDUCING AGENTS **10 Hrs**

Role of bone marrow in cell synthesis, Growth factors – Types and their role in cell development.

UNIT- III CELL LINES **12 Hrs**

Cell lines – Types, Commonly used cell lines and selection of cell lines; maintenance of cell culture; Sub culture – Mono layer culture, Criteria for sub culture of mono layer, technique; Suspension cultures.

UNIT- IV EMBRYONIC STEM CELLS **13 Hrs**

Stem cell culture – Embryonic stem cell, methods to produce differentiated cells, maintenance of stem cells. Stem cell bank.

UNIT- V APPLICATIONS OF STEM CELLS **15 Hrs**

Human embryonic stem cell research- Parkinson's Diseases, Diabetes, Heart muscle repair. Applications of stem cells in study of tissue differentiation, molecular signals and testing of new drugs.

Text Books

- U. Sathiyanarayana (2007).*Biotechnology*. Books & Allied (P) Ltd.
- V. Kumaresan (2009). *Biotechnology*. Saras publication. Nagercoil revised edition.

Reference Books

- Old ,R.W, PrimroseS.B (2003).An introduction to Genetic Engineering. Blackwell Science.
- Sasidhara,(2006).Animal Biotechnology. MJP publishers.

MOLECULAR ENDOCRINOLOGY
UBCO607

Semester	**: VI**	**Credits**	**: 4**
Category	**: Major Elective**	**Hours/Week**	**: 5**
Class & Major	**: III B.Sc Biochemistry**	**Total Hours**	**: 65**

Objectives:

To enable the students

- Understand hormonal influence in human physiology
- Determine the familial and medical history relevant to endocrine problems

Learning Outcomes:

On completion of the course, the students will be able

- Identify the integration of the endocrine system in general with focus on specific interactions
- Apply endocrinological principles to determine the pathophysiological basis and consequences of specific endocrine disorders.

UNIT-I INTRODUCTION **15 Hrs**

Hormones - Definition, Classification, Biosynthesis, Characteristic features. Hormones receptors - Features and Structure, Regulation of receptor levels. Mechanism of Hormone action. Signal transduction.

UNIT-II PITUTUARY HORMONES **15 Hrs**

Secretion, biological action, and regulation of growth hormone. Adreno corticotropic hormone, Prolactin, Gonadotropic hormone, Follicle stimulating hormone. Leutinizing hormone, Antidiuretic hormone and oxytocin. Hyper and Hypopituitarism Disorders - Dwarfism, Gigantism, Acromegaly, Cushing's disease and Diabetes Insipidus.

UNIT-III THYROID HORMONES **15 Hrs**

Biosynthesis, secretion, transport, regulation and Biological action of thyroid stimulating hormones. Thyroxine. Disorders: Hyperthyroidism & Hypothyroidism disorders- Cretinism, Myxoedema and Hashimoto's diseases, Graves's diseases, Exophthalmoses, Toxic Goiter and Non- toxic Goiter.

UNIT-IVPANCREATIC HORMONES **10 Hrs**

Synthesis, Regulation, Biological action of Insulin, Glucagon, Somatostatin and insulin growth factor, Disorders- Diabetes Mellitus, Hypoglycemia.

UNIT-V ADRENAL AND GONADOL HORMONES **10 Hrs**

Glucocorticoids and Mineralocorticoids - Synthesis-Secretion- Transport, Biological effects-Metabolism and Excretion. Gonadal hormones-Biological action of Androgens and Estrogens.

Text Books

- Lohar, S.Prakasa (2006). *Endocrinology- Hormones & human health.*MJP Publishers.
- Devlin, Thomas, M (2010).*Textbook of Biochemistry (with clinical correlation).*John Wiley & Son's publishers. (7th ed.,).

Reference Books

- Austin and Short (2019). *Mechanism of hormone action*. Prema Jaypee Brothers.
- Robert, K. Murray *et al* Appleton and Lange Stanford Connecticut, (2005). *Harper's Biochemistry*.(25th ed.,).

E-Resources

- https://www.elsevier.com/books/molecular-endocrinology/bolander/978-0-12-111232-5
- https://www.amazon.in/Molecular-Endocrinology-Franklyn-Bolander-ebook/dp/B01D4CI1AQ
- https://www.amazon.in/Molecular-Endocrinology-Human-Genetics-ebook/dp /B01E3EUF8U
- https://www.kobo.com/us/en/ebook/molecular-endocrinology-1
- https://www.ebooks.com/en-ao/297039/molecular-endocrinology/franklyn-f-bolander/

PATHOBIOLOGY OF HUMAN DISEASES AND DISORDERS

UBCO606

Semester	**: VI**	**Credits**	**: 4**
Category	**: Major Elective**	**Hours/Week**	**: 5**
Class &Major	**: III B.Sc Biochemistry**	**Total Hours**	**: 65**

Objectives:

To enable the students

- Understand pre-clinical and clinical education in Pathobiology
- Categorize the contemporary in health issues
- Compare normal and abnormal cells in humans that generates new knowledge in Pathology

UNIT –I DIGESTIVE TRACT DISORDERS 13 Hrs

Diseases related to digestive tract - Inflammatory Bowel Syndrome, Electrolyte disorder, Liver cirrhosis, Food poisoning, GI tract cancers, Peptic ulcer -H.pylori infection.

UNIT- II HAEMODYNAMIC DISORDERS AND CLINICAL PATHOLOGY 13 Hrs

Mechanism of Blood Coagulation, Intrinsic and extrinsic pathways of blood clotting, List the blood clotting factors, Fibrinolytic system, Importance of coagulation. Blood coagulation profile determination, Examination of Bone marrow and it uses

UNIT- III CELL INJURY AND PARASITIC INFECTIONS 13 Hrs

Normal and abnormal cell, Cell Injury- Types of cell injury, Etiology of cell injury,

morphology of cell injury, Cellular swelling. Diagnosis of blood parasites like Malarial, Filariasis, Viruses like Hepatitis virus, Vibrio cholera.

UNIT- IV INFLAMMATION 13 Hrs

Inflammatory markers – C Reactive protein, Estimation of C - reactive protein, Rheumatoid Arthritis, Rheumatoid fever, Tuberculosis and Neoplasia.

UNIT- V DISEASES DUE TO MISFOLDED PROTEINS 13 Hrs

Introduction to protein folding and proteosome, Removal of misfolded proteins; Etiology and Molecular basis for Alzheimer's, Prion diseases, Huntington's chorea, Sickle cell anemia and Thalassemia.

Text Books

- Chakraborty Gargi Chakraborty,P (2005).*Practical Pathology*. New Central Book Agency. Kolkotta.
- Praful, B. Godkar(2014).*Text Book of Medical Laboratory Technology*. Bhalani publishing house.

Reference Books

- Sir John Dacie (2011).*Practical Hematology.* Churchill Livingstone. London (5^{th} ed.,).
- Todd & Sanford (2009).*Clinical Diagnosis & Management by Laboratory Methods*. All India traveler Book sellar. New Delhi.
- Harsh Mohan (2010).*Text Book of Pathology* .Jaypee Brothers. (6^{th} ed.,).

E_Resources

- https://www.elsevier.com/books/clinical-biochemistry/murphy/978-0-7020-7298-7
- https://bookboon.com/en/introduction-to-clinical-biochemistry-ebook

NANOTECHNOLGY IN MEDICINE

UIDM601

Semester : VI **Credits : 4**
Category : Major Elective **Hours/Week : 5**
Class &Major : III B.Sc. Biochemistry **Total Hours : 65**

Objectives:

To enable the students

- Identify the various types of Nano medicine.
- Determine the importance of Nano materials in Nano medicine

UNIT- I OVERVIEW OF NANOTECHNOLOGY 13 Hrs

Basics of nanotechnology - State of art of nanotechnology- Relevance of nanotechnology- impact on economy and future development- Applications.

UNIT- II NANOTECHNOLOGY IN EVERYDAY LIFE 13 Hrs

Nanotechnology based products- Daily usage- Associated concepts-Advantages of using

nanotechnology products. Applications of nanotechnology in Biomedical fields.

UNIT -III NANOMEDICINE **13 Hrs**

History of the idea – Nanomedicine taxonomy – Bio pharmaceuticals –implantable materials – surgical Aids – diagnostic Tools – imaging. Polymer micelles as drug carriers: polymer micelle structures – drug loading and release – Phramacokinetics and Biodistribution – Drug delivery applications – clinical trials.

UNIT -IV NANOCAPSULES **13 Hrs**

Introduction – preparation – Characteristics of Nano Capsules – Drug release – Applications.

UNIT- V NANOTECHNOLOGY IN MEDICINE AND HEALTH **13 Hrs**

Cardiovascular diseases, Cancer, Diabetes . Nanotechnology - Implants and prosthetics - nanotechnology and burn victims - Diagnosis and therapy - Drug delivery using nanoparticles - Nanotechnology fights infections - Pharmaceutical nanotechnology research.

Text Books

- John Mongillo (2007).*Nanotechnology 101*. Greenwood Press.
- Chattopadhyay , K.K. and BanerjeeA.N (2009).*Introduction to Nanoscience and Nanotechnology*. PHI Learning Ltd. New Delhi.

Reference Books

- Joe Anne Shatkin ,(2008).*Nanotechnology: Health and Environmental risks.* CRC press.
- Parag Diwan and Asish ,Bharadwaj,(2006).*Nanomedicines*. Ed. By, Pentagan Press.
- Vladimir P Torchilin (2006). *Nanoparticles as Drug Carriers*. Imperial College Press. North Eastern University. USA**.**

E_Resources

- https://booksfree4u.tk/download-nanomedicine-ebook-pdf-free
- https://sites.google.com/site/.../The-Handbook-of-Nanomedicine.pdf
- nptel.ac.in

III & IV Evaluation Components of CIA

I Semester	II Semester	Credit
Paper I (6 hours)	-	5
Paper II (6 hours)	-	5
Paper III (Special area study paper)	-	5
Paper IV(Research And Publication Ethics)(2 hours)	-	**2**
-	Dissertation & Viva voce	13
▪ **Paper Presentation (minimum one) &** ▪ **Publication of articles in Journals (minimum one) are mandatory for submission of Dissertation.**		**30**

M.Phil PROGRAMME PROFILE – ALLOTMENT OF HOURS & CREDITS
(With effect from 2020-2021 batches onwards)

Semester	Category	Course Code	Course Title	Component III	Component IV
V	Core VII	UBCM504	Enzymes & Intermediary Metabolism	Assignment	Seminar
	Core VIII	UBCM505	Human Physiology	Model presentation	Seminar
	Core IX	UBCM506	Basics of Bioinformatics	Creating protein database	Assignment
VI	Core XI	UBCM605	Introduction to Biotechnology	Model presentation	Experiential Learning
	Core XII	UBCM606	Clinical Biochemistry	Experiential Learning	Seminar
	Core XIII	UBCM607	Molecular Biology	Assignment	Seminar
	Major Elective	UBCO604	Stem Cell Biology	Culture preparation	Seminar
		UBCO607	Molecular Endocrinology	Poster Presentation	Seminar
		UBCO606	Pathobiology of Human Diseases and Disorders	Case Study	Seminar
		UIDM601	Nanotechnology in Medicine	Model presentation	Seminar

DEPARTMENT OF CHEMISTRY

PREAMBLE

UG **:**Programme Profile and the Syllabi of Courses Offered in Semester V and VI Along with III And IV Evaluation Components (With Effect From 2018 – 2021 Batch onwards)

PROGRAMME PROFILE B.Sc. (Chemistry)

Programme Specific Outcome (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 Hrs/ Week	Min/Max
I	I	Tamil/Hindi/French	UTAL105/ UTAL106/ UHIL101/ UFRL101	Basic Tamil-I/ Advanced Tamil-I/ Hindi-I/ French-I	UTAL103/ UTAL104	4	2/3
	II	English	UENL107/ UENL108	General English-I/ Advanced English-I	-/ UENL106	5	3/4
	III	Core I	UCHM104	Fundamentals of Chemistry	-	2	1
		Core II	UCHM105	General Chemistry –I	-	4	4
		Core III	UCHM106/UCHM107	Analytical Chemistry	-	4	4
		Core Practical I	UCHR204/UCHR205	Volumetric Analysis	-	3	-
		Allied I	UPHA102	Allied Physics - I	-	3	3
		Allied Practical I	UPHR103	Allied Physics Practical-I	-	3	2
	IV	Value Education				2	1
Total						**30**	**20/22**
II	I	Tamil/Hindi/French	UTAL205/ UTAL206/ UHIL201/ UFRL201	Basic Tamil-II/ Advanced Tamil-II/ Hindi-II/ French-II	UTAL203/ UTAL204	4	2/3
	II	English	UENL207/ UENL208	General English-II/ Advanced English-II	-/ UENL206	5	3/4
	III	Core IV	UCHM202	General Chemistry –II	-	6	6
		Core Practical I	UCHR204/UCHR205	Volumetric Analysis	-	3	4
		Allied II	UPHA201	Allied Physics II	-	3	3
		Allied Practical I	UPHR202	Allied Physics Practical-II	-	3	2
	IV	NME			-	4	2
		Soft Skill			-	2	1
	V	Extension Programme/ Physical Education/NCC			-	-	1/2
Total						**30**	**24/27**
III	I	Tamil/Hindi/French	UTAL305/ UTAL306/ UHIL301/ UFRL301	Basic Tamil-III/ Advanced Tamil-III/ Hindi-III/ French-III	UTAL303/ UTAL304	4	2/3

	II	English	UENL307/ UENL308	General English-III/ Advanced English-III	-/ UENL306	5	3/4
	III	Core V	UCHM305	General Chemistry –III	UCHM303	5	5
		Core Practical II	UCHR404/UCHR405	Semi Micro Qualitative Inorganic Analysis	-	3	-
		Core VI	UCHM306	Separation & Purification Techniques	UCHM304	3	3
		Core VII		Online Course (NPTEL/ST)	-	3	1/2
		Allied	UMAA304	Algebra, Differential Calculus and Trigonometry	-	5	5
	IV	Value Education				2	1
				Total		**30**	**20/23**
IV	I	Tamil/Hindi/French	UTAL405/ UTAL406/ UHIL401/ UFRL401	Basic Tamil-IV/Advanced Tamil-IV/ Hindi-IV/ French-IV	UTAL403/ UTAL404	4	2/3
	II	English	UENL407/ UENL408	General English/ Advanced English	-/ UENL406	5	3/4
	III	Core VIII	UCHM405	General Chemistry –IV	UCHM402 UCHM403	5	5
		Core Practical II	UCHR404/UCHR405	Semi Micro Qualitative Inorganic Analysis	-	3	4
		Core IX	UCHM406	Instrumental Method of Analysis	UCHM404	4	4
		Allied	UMAA406	Integral Calculus, Laplace Transform & Ordinary Differential Equation	-	5	5
		Core X Project/ paper	UCHP501/UCHM507	Project/Dairy and its Products	-	2	-
	IV	Soft Skill	USKS401			2	1
	V	Extension Programme/ Physical Education/NCC				-	2
				Total		**30**	**24/28**
V	III	Core XI	UCHM508	Inorganic Chemistry – I	UCHM501 UCHM504	**5**	**4**
		Core XII	UCHM509	Organic Chemistry –I	UCHM502 UCHM505	**6**	**5**
		Core XIII	UCHM506	Physical Chemistry –I	UCHM503	5	4
		Core Practical III	UCHR501	Gravimetric Analysis	-	4	4
		Core Practical IV	UCHR605	Physical Chemistry Practical	-	4	-
		Core X Paper/ Project	UCHP501/ UCHM507	Project / Dairy and its Products	-	4	4/5
	IV	Value Education				2	1
				Total		**30**	**22/23**
VI	III	Core XIV	UCHM611	Inorganic Chemistry II	UCHM601 UCHM607	**4**	**4**
		Core XV	UCHM612	Organic Chemistry II	UCHM602 UCHM608	**4**	**4**
		Core XVI	UCHM609	Physical Chemistry II	UCHM603	4	4
		Core XVII	UCHM613	Physical Chemistry III	UCHM610	**4**	**4**
		Major elective	UCHO602 UCHO603 UCHO604	Polymer Chemistry Medicinal Chemistry Forensic Chemistry	-	5	4

			UCHO605	Dyes and Textile fibre			
		Core Practical IV	UCHR605	Physical Chemistry Practical	-	3	4/4
		Core Practical V	UCHR606	Organic Analysis and Preparation	-	4	4
		Viva –Voce	UCHM605	Comprehensive Viva-Voce	-	-	1
	IV	Soft Skill	USKS601		-	2	1
	V	Extension Programme/ Physical Education			-	-	2
Total						**30**	**30/32**
Grand Total						**180**	**140/155**

LIST OF COURSES OFFERED TO OTHER DEPARTMENTS
ALLIED AND ALLIED OPTIONAL COURSES

Semester	Part	Category	Course Code	Course Title	Pervious Course Code	Contact hrs per week	Credits
							Min/Max
I	III	Allied- I	UCHA102	Chemistry – I		5	4
IV	III	Allied- I	UCHA402	Chemistry for Physics		3	3
I	III	Allied Practical-I	UCHR103	Volumetric & Organic Analysis	-	3	2
IV	III	Allied 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 hrs per Week	Credits
							Min/Max
II	IV	Non major Elective	UCHE204	Food Chemistry	-	4	2

EXTRA CREDIT EARNING PROVISION

Semester	Category	Course Code	Course Title	Pervious Course Code	Hrs 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	Hours/Days /Month	Mode of Evaluation
V	Core	UCHT501	Industrial Lab Safety	TCIL	4 days	To Get Certificate

INORGANIC CHEMISTRY – I

UCHM508

Semester : V **Credit : 4**
Category : Core XI **Hours/Week: 5**
Class Major : III-B.Sc. Chemistry **Total Hours: 65**

Objectives:

To Enable the Students

- Learn the binary compounds.
- Understand organometallic compounds.
- Acquire the basic concept and theory of co-ordination chemistry and nuclear chemistry

Learning Outcomes:

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

- Understand the classification, preparation, properties and uses of binary and organometallic compounds
- Comprehend the theories, crystal defects and semi-conducting nature of metallic state substances.
- Acquires the basic concepts of nuclear chemistry, radioactivity and nuclear transformations.
- Applying the knowledge of gravimetric and precipitation techniques in the chemical industries.

UNIT-I BINARY AND ORGANOMETALLIC COMPOUNDS 11 Hrs

Binary compounds - Hydrides, borides and nitrides - Classification, preparation, properties and uses. Organometallic compounds of alkenes like ethylene & butadiene, alkynes like acetylene & diphenyl acetylene and cyclopentadiene.

UNIT –II GRAVIMETRIC ANALYSIS 12 Hrs

Principles of gravimetric analysis – Gravimetric factor – Calculations involved – conditions for precipitation – Theory of precipitation – Types of precipitants - Organic

precipitants & advantages – Purity of precipitates – Co-precipitation and post-precipitation – precipitation from homogeneous solution; crucibles – Types and maintenance – Washing of the precipitates – Drying and ignition of precipitates.

UNIT- III SOLID STATE **15 Hrs**

Packing of atoms (Bcc, Ccp and Hcp) - Theories of Bonding - Electron gas, pauling and band theories. Structure of alloys - Interstitial solid solutions - Hume- Rothery rule - Crystal defects in Stoichiometric and non-Stoichiometric compounds. Semi-conductors - extrinsic and Intrinsic - N-Type and P-Type - Composition, structure and uses in electronic industry

UNIT- IV NUCLEAR CHEMISTRY **12 Hrs**

Introduction - Composition of nucleus and nuclear forces. Nuclear stability - n/p ratio - mass defect, binding energy, packing fraction and magic numbers - Nuclear shell and liquid drop models. Isotopes - Detection and separation - Isotopic constitution of elements - Whole number rule - Isobars, isotones and nuclear isomers.

UNIT -V RADIOACTIVITY AND NUCLEAR TRANSFORMATIONS **15 Hrs**

Radioactivity - Discovery, detection and measurement (Wilson Cloud Chamber) - radioactive emission - Disintegration theory - Modes of decay - Rate of disintegration - Half-life- Average life - Radioactive series. Nuclear transformations - Use of Projectiles - Nuclear Reactions - Fission and fusion - Nuclear reactor - Applications of radioisotopes - Carbon dating - Radioactive waste disposal.

Reference Books

- Madan, R.D. (2008). *Modern Inorganic Chemistry.* (2nd ed.,). S. Chand and Company Ltd. New Delhi.
- Satyaprakash. Tuli, G.D. Basu,S.K. and Madan, R.D. (2006). *Advanced Inorganic Chemistry* (Vol. I & II). S. Chand. New Delhi.

Text Books

- Soni, P.L and Mohan Katyal. (2007) *Text Book of Inorganic Chemistry.* (20thed.,). Sultan Chand & Sons. New Delhi.
- Lee, J.D. (1991). *Concise Inorganic Chemistry.* (4thed.,). ELBS.

e-Resources

- http://dpuadweb.depauw.edu/harvey_web/eTextProject/pdfFiles/Chapter8.pdf
- https://www.fys.ku.dk/~jjensen/Book/echap1_3.pdf
- https://preparatorychemistry.com/Bishop_Book_atoms_16.pdf
- https://www.mcvts.net/cms/lib/NJ01911694/Centricity/Domain/136/chap24.pdf
- https://uomustansiriyah.edu.iq/media/lectures/6/6_2017_03_14!12_38_50_AM.pdf
- https://shodhganga.inflibnet.ac.in/bitstream/10603/24695/2/02_chapter%201%20with%20references.pdf

ORGANIC CHEMISTRY – I

UCHM509

Semester	**: V**	**Credits**	**: 05**
Category	**: Core XII**	**Hours/Week**	**: 06**
Class Major	**: III-B.Sc. Chemistry**	**Total Hours**	**: 78**

Objectives:

To Enable the Students

- Understand reactions of alcohols and phenols
- Identifythe organic compounds of nitrogen
- Classify the Carbohydrates
- Developthe Carbonyl compounds

Learning Outcomes:

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

- Acquires the knowledge of preparation, properties and applications of alcohols, phenols, thiols and ethers.
- Understands the knowledge of reaction mechanisms of nitro and carbonyl compounds.
- Classifies and elucidates the structure, properties and uses of carbohydrates.

UNIT- I REACTION OF ALCOHOLS, PHENOLS & THIOLS 15 Hrs

Alcohols: Reactions with sodium - hx (lucas test) – Esterification. Oxidation with PCC - Alkaline.$kmno_4$ - Acidic dichromate - Con.hno_3. oxidation of diols - Pinacol-pinacolone rearrangement.

Phenols: Preparation – Bicumene hydroperoxide method - Diazonium salts. reactions – Electophilic substitution - Nitration, halogenations and sulphonation. Gattermann-Koch reaction, Houben - Hoesch condensation, Schotten Baumann reaction. Acidic character of phenol, Comparative strength of alcohol and phenol.

Thiols: Nomenclature - Methods of preparation, properties and uses. Thioethers – Nomenclature - Methods of preparation, properties and uses.

UNIT- II NAME REACTIONS 15 Hrs

Mannich reaction, Birch reduction, Dakin reaction, Simmons - Smith reaction, Kolbe-schmitt reaction, Mukaiyama reaction, Hundiecker reaction, Chichibabin reaction, Nef reaction, Stephen reaction, Reimer-tiemann reaction, Wurtz reaction, Ullmann reaction, Norrish type cleavage.

UNIT -III ORGANIC COMPOUNDS OF NITROGEN 15 Hrs

Nitro Compounds: Preparation of nitroalkanes and nitroarenes. reduction of nitrobenzene under various conditions, nitro-aci nitro tautomerism.

Amines (aliphatic and aromatic): Cassification, preparation from alkyl halides, gabriel- Phthalimide synthesis, Hofmann bromamide reaction. Hofmann and saytzeff Elimination, Carbylamine test, Hinsberg test, with $nano_2$+hcl, schotten-baumann reaction, Electophilic substitution in aniline: nitration, bromination and sulphonation.

Diazonium salts: preparation from aromatic amines. Conversion to Benzene, Phenol and Azodyes.

UNIT- IV CARBONYL COMPOUNDS 18 Hrs

Aldehydes and Ketones: Structural significance of the carbonyl function and Nomenclature. Formaldehye, acetaldehyde, acetone and benzaldehyde - Preparation from

acid chlorides & Nitriles. Reactions with HCN, ROH, $NaHSO_3$, Amino derivatives. Iodoform test, Aldol condensation, Cannizzaro's Reaction, Wittig Reaction, Benzoin condensation, Clemmensen reduction, Wolff Kishner reduction and meerwein Pondorff-Verley reduction.

Carboxylic Acids & Their Derivatives: Preparation of formic, Acetic and benzoic acids. Synthetic applications of diethyl malonate & Ethyl acetoacetate. Preparation of acid chlorides, Anhydrides, Esters and amides from acids and their inter-Conversion. Comparative study of the Nucleophilicity of acyl derivatives. Reformatsky reaction, Perkin condensation and hell-Volhardt-Zelinsky reaction.

UNIT –V CARBOHYDRATES **15 Hrs**

Carbohydrates - Classification – Aldoses and ketoses, Reducing and non-reducing sugars - Reactions of glucose and fructose – Osazone formation, mutarotation and their mechanism - Structural elucidation of glucose and fructose – Pyranose and furanose forms – Haworth's method. Determination of ring size- Haworth projection formula - Configuration of glucose and fructose - Epimerization - Chain lengthening and chain shortening of aldoses - Inter conversion of aldoses and ketoses – uses of glucose. Disaccharides and polysaccharides - Reactions and structural elucidation of sucrose and maltose - Properties, structure and uses of starch and cellulose.

Reference Books

- Morrison and Boyd, R.T. (2010). *Organic Chemistry* (VI ed.,). Prentice Hall of India. New Delhi.
- Ahluwalia,V.K & Rakesh Kumar Parashar. (2015). *Organic Reaction Mechanisms.* (IV ed.,). Narosa Publishing house.

Text Books

- Soni, P.L. (2010). *Text Book of Organic Chemistry.* Sultan Chand.
- Bahl and Arun Bahl. (2014). *Advanced Organic Chemistry.* S. Chand.
- Peter Sykes. (2013). *A Guide Book to Mechanism in Organic Chemistry.* (VI ed.,)

e-Resources

- http://www.ncert.nic.in/ncerts/l/lech202.pdf
- https://www.angelo.edu/faculty/kboudrea/index_2353/Chapter_03_2SPP.pdf
- http://www.chtf.stuba.sk/~szolcsanyi/education/files/Organicka%20chemia%20II/Prednaska%209_Sacharidy/Doplnkove%20studijne%20materialy/Carbohydrates_Boudreaux.pdf
- https://authors.library.caltech.edu/25034/17/BPOCchapter16.pdf
- http://cms.gcg11.ac.in/attachments/article/105/NITRO%20COMPOUNDS.pdf

PHYSICAL CHEMISTRY-I

UCHM506

Semester : V **Credits : 4**
Category : Core XIII **Hours/Week : 5**
Class Major: III-B.Sc. Chemistry **Total Hours : 65**

Objectives:

- To improve the ability of mathematical calculations involved in physical chemistry.
- To enable the students to understand the concepts of thermodynamics and apply it to more space physical and chemical system.
- To make the students know the concepts of chemical kinetics and to apply the concepts of kinetics to different processes.

UNIT-I PARTIAL MOLAR PROPERTIES 12 Hrs

Chemical potential – Gibbs Duhem equation – Effect of temperature and pressure on chemical potential – Chemical potential in systems of ideal gases – Duhem margules equation.

Homogeneous catalysis-Definition- Function of a catalyst in terms of gibbs free energy of activation. Heterogeneous catalysis- Application of catalysis.

UNIT-II PHASE RULE 13 Hrs

Concepts of phase, Components and degrees of freedom with examples. Gibb's Phase Rule-Derivation, Classius - Clapeyron equations and their applications to equilibria in Phase Transitions. (Solid– Liquid, Liquid – Vapour, Solid-Vapour)

One Component System: Phase diagram-Water and sulphur systems.

Reduced Phase Rule: Two component systems - Simple eutectic: Lead-Silver system - Formation of compound with Congruent melting point: $FeCl_3$ -Water system , Other examples formation of compound with incongruent melting point: Na-K system

UNIT-III ADSORPTION: 10 Hrs

Physisorption & chemisorption- Freundlich adsorption isotherm – Langmuir adsorption isotherm –Bet equation (no derivation) application of adsorption.

Concept of fugacity & activity: Determination of fugacity of a gas- Change of fugacity with temperature. Activity & activity coefficient- Determination of activities – variation of activity of a gas with temperature & pressure- Nernst distribution law – limitations- Thermodynamic derivation –Applications.

UNIT-IV CHEMICAL KINETICS I 15 Hrs

Order and molecularity of reactions: Definition of rate, order rate law, rate constants, molecularity – Simple reactions involving zero, first, second and third order reactions derivations of rate equations for zero, first, second and third order reactions - pseudo first order reactions. Derivation of half life time – Change with examples. Methods to determine order of reactions. Problems based on order, Rate equations and $T_{1/2}$.

Types of reactions: Reversible or opposing, consecutive and parallel reactions (simple ideas only). Thermal chain reactions (i) h_2 and br_2 reaction (ii) Dissociation of acetaldehyde steps involved only (no kinetics expressions needed)

UNIT-V CHEMICAL KINETICS II **15 Hrs**

Theories of chemical reaction rates: Factors affecting chemical reactions – Nature of reactants concentration, Catalyst, Solvent polarity and ionic strength (only qualitative ideas), Arrehenius theory of chemical reaction rates collision theory of bimolecular and unimolecular reactions. Lindemann hypothesis, Transition state or absolute reaction rate theory (ARRT)

Text Books:

- Puri Sharma Pathania.(2009). *Principles of Physical Chemistry*. Shoban Lal Nagin Chand & Co. Jalandhar.
- Soni, P. L. (2006). *Text Book of Physical Chemistry.* Sultan Chand.

Reference Books:

- Negi and Anand. (2000). *Physical Chemistry.* New Age.
- Kundu and Jain. (1999). *Physical Chemistry.* S. Chand.

GRAVIMETRIC ANALYSIS

UCHR501

(This Replaces the Course UCHR601 Gravimetric Analysis Found in Academic Council Booklet-II)

Semester :V **Credit : 4**
Category : Core Practical III **Hours/Week : 4**
Class Major: III-B.Sc. Chemistry **Total Hours : 52**

Objectives:

To Enable the Students

- Analyze the ions or metals present in the given substance by gravimetric method.
- Acquire quantitative skills to get accurate result.

Experiments:

Part I : Gravimetric Estimation

1. Estimation of Sulphate as Barium sulphate.
2. Estimation of Barium as Barium sulphate.
3. Estimation of Barium as Barium chromate.
4. Estimation of Lead as Lead chromate.
5. Estimation of Calcium as Calcium oxalate monohydrate.
6. Estimation Zinc or Magnesium as oxinate.

Part-II

1. Physical constant (melting & boiling point)

Text Books:

- Venkateswaran,V. Veerasawamy, R. & Kulandaivelu, A. R. (1998) *Basic Principles of Practical Chemistry.* S. Chand & Sons Publications.

Reference Books:

- Vogel's. (1989). *Text book of Quantitative Chemical Analysis* (5^{th} ed.,). ELBS/ Longman. England.

- Thomas, A. O. (1999). *Practical Chemistry.* Scientific Book Center. Cannanore
- Sundaram, S. and Viswanthan, S. (1998). *Practical Chemistry.* (3 Volumes).

PHYSICAL CHEMISTRY PRACTICAL

UCHR605

(This Replaces the Course UCHR501 Physical Chemistry Practical Found in Academic Council Booklet-II)

Semester: V & VI **Credit : 4**

Category: Core Practical- IV **Hours/Week: 4 + 4**

Total Hours: 52+52

Objectives:

To Enable the Students

- Acquire skills through the experimental techniques.
- Interpret the experimental results.

1. Distribution law:

a) Determination partition coefficient of iodine between carbon tetra chloride and water.

b) Equilibrium constant of the reaction $KI + I_2 = KI_3$

2. Kinetics:

Determination of the orders of the following reactions.

a) Acid catalysed hydrolysis of an ester (Methyl or Ethyl Acetate).

3. Molecular Weight of Solute – Rast method using Naphthalene, Meta Dinitrobenzene and Diphenyl as solvents.

4. Heterogeneous Equilibria:

Phenol – water system CST.

5. A) Effect of Impurity – 1 % Nacl or 2% Succinic acid solutions on phenol determination of the concentration of the given solution.

B) Determination of the Transition Temperature of the Given Salt Hydrate. $Na_2S_2O_3.5H_2O$, $CH_3COONa.H_2O$, $SrCl_2.6H_2O$, MnCl2.4H2O.

6. Electrochemistry: Conductivity

A) Determination of cell constant.

B) Conductometric titration of a strong acid against a strong base.

7. Potentio metric Titration

A) Strong acid against a strong base.

8. Calorimetric Titration.

9. Polarimetric– inversion of sugar.

Text Books

- Venkateswaran. V, Veerasawamy. R. & Kulandaivelu, A. R. (1998). *Basic Principles of Practical Chemistry.*S. Chand & Sons Publications.

Reference Books

- Vogel's. (1989). *Text Book of Quantitative Chemical Analysis.* (5^{th}ed.,). ELBS/ Longman. England.
- Thomas, O. (2000). *Practical Chemistry.* Scientific Book Center. Cannanore.
- Sundaram, S. (1999). *Practical Chemistry.*(3^{rd}Vol).

PROJECT
UCHP501

Semester : V **Credit :1**
Category : Project
Class &Major: III-B.Sc., Chemistry

Objectives:
To Enable the Students
- Acquire the Research Knowledge About the Subject.
- Analyze the Experiments on their Own Knowledge.

Mini-Project:
- This course will be offered as project for the final year ug students under extra credit earning provision to gifted students outside the class hours.
- It could be done either individual or as a group with the maximum of three students

Evaluation Scheme for the Project (Internal-60 + External-40)
Internal Assessment:

S. No	Component	Marks
1	Review of the Literature	
2	Title of the Topic	10
3	Experimental	10
4	Characterization	20
5	Result and Discussion	30
6.	Conclusions	
Total		60

External Assessment:
1. **Report : 10**
2. **Presentation : 20**
3. **Viva-Voce : 10**
   Total : 40

INORGANIC CHEMISTRY – II
UCHM611

Semester : VI **Credits : 4**
Category : Core XIV **Hours/Week : 4**
Total Hours : 52

Objectives:
To Enable the Students
- Understand Biological Aspects of Metals.
- Classify Metallurgy of d-block Elements.
- Compare Lanthanides and Actinides.

Learning Outcomes:
On Completion of the Course, the Student will be Able to
- Understands the fundamentals of subatomic particles, Nucleon theory, Orbital electron capture

- Acquires the basic knowledge, Isomerisation and applications of coordination compounds.
- Classifies and elucidates the structure, Preparation, Properties and applications of biological, carbonyl and nitrosyl compounds**.**

UNIT- I LANTHANIDES 12 Hrs

General study involving electronic configuration, Oxidation state, Magnetic properties and complexation behaviour - Lanthanide contraction - Comparative study of lanthanides and actinides.

UNIT- II ACTINIDES 10 Hrs

General study involving electronic configuration, Oxidation state, Magnetic properties and complexation behaviour - Actinide contraction - Comparative study of lanthanides and actinides.

UNIT- III COORDINATION CHEMISTRY 12 Hrs

Types of ligands – Chelations & effects of chelation- Applications of complexes- IUPAC nomenclature-Theories of coordination compounds – Valence bond and its application crystal field theory – Splitting of d-orbitals on oh, td &square plannar complexes – Cfse- calculation of cfse in oh &td complex. Stability of complexes - Factors affecting stability. unimolecular and bimolecular nucleophilic substitution reactions in octahedral and square planar complexes - Trans effect. Application of coordination compounds

UNIT- IV BIOINORGANIC CHEMISTRY 10 Hrs

Biologically important coordination compounds - Chlorophyll, hemoglobin and vitamin b_{12}- Structure and applications (elucidation not required). metal carbonyls - Mono and polynuclear carbonyls of ni, fe, cr, co and mn- synthesis, reaction, structure and uses. nitrosyl compounds -Classification, preparation and properties - Structure of nitrosyl chloride and sodium nitro prusside.

UNIT- V ACIDS AND BASES 08 Hrs

Arrehenium concept - Lowry-Bronsted concept - Lux-flood concept - The solvent system concept - The Lewis concept - Hard & soft acids and bases - Pearson's concept - HSAB principle and its applications.

Reference Books

- Soni, P. L. and Mohan Katyal. (2007). *Text Book of Inorganic Chemistry.* (20^{th} ed.,). SultanChand & Sons. New Delhi.
- Lee, J. D. (1991). *Concise Inorganic Chemistry.* ELBS. (4^{th} ed.,)

Text Books

- Madan, R.D. (2008). *Modern Inorganic Chemistry.* (2^{nd} ed.,). S. Chand and Company Ltd. New Delhi.
- Puri, B.R. Sharma, L.R. & Kalia. K.C. (2011-12). *Principles of Inorganic Chemistry.* (31^{st} ed.,).

e-Resources

- https://chandand.weebly.com/uploads/9/2/2/7/92278224/_inorganic_chemistry__a_textbook_series__lawrance_g.a.introduction_to_coordination_chemistrywiley__2010_.pdf
- https://fns.uniba.sk/fileadmin/prif/chem/kag/Bakalar/vch_noga/GEN_INORG_CHEM15.pdf
- http://www.rbmcollege.ac.in/sites/default/files/files/reading%20material/hard-and-soft-acids-and-bases.pdf
- http://downloads.hindawi.com/journals/ijp/2001/107129.pdf

ORGANIC CHEMISTRY – II
UCHM612

Semester : VI **Credit : 04**
Category : Core XV **Hours/Week : 04**
Class &Major : III B.Sc. Chemistry **Total Hours : 52**

Objectives:
To Enable the Students

- Understand heterocyclic compounds
- Illustrate the Terpenoids and Alkaloids
- Analyze Aminoacids and Nucleic acids
- Categorize rearrangement reactions.

Learning Outcomes:
On Completion of the Course, the Student will be Able to

- Acquires the knowledge of synthesis and aromaticity of hetero cycling compounds.
- Gains the knowledge of structural properties of the amino acids, peptides, proteins and nucleic acids.
- Understands the mechanism and reactions of molecular rearrangement.
- Justifies the isolation and structural determination of natural products and its classification.

UNIT-I HETEROCYCLIC COMPOUNDS 12 Hrs

Molecular orbital and aromatic characteristics of pyrrole, furan, thiophene and pyridine. Methods of synthesis and chemical reactions with emphasis on the mechanism of electrophilic substitution reaction - Mechanism of nucleophilic substitution reactions in pyridine derivatives. Comparison of basicity of pyridine, piperidine and pyrrole. Introduction to condensed five and six-membered heterocyclic compounds. Preparation and reaction of indole, quinoline and isoquinoline with special reference to Bisler-Napieralski synthesis. reaction mechanism of electrophilic substitution reactions of indole, quinoline and isoquinoline.

UNIT-II NATURAL PRODUCTS 10 Hrs

Occurrence of terpenoids and alkaloids. Terpenes - Definition - General properties – Isoperene rule – Structural elucidation of citral, Geraniol, A-Terpenol and Camphor. Alkaloids - Definition – General properties – Classification – Isolation – Structure determination of conine, piperine and nicotine.

UNIT- III AMINOACIDS, PEPTIDES, PROTEINS AND NUCLEIC ACIDS 12 Hrs

Aminoacids: Classification, Structure and stereochemistry of amino acids, Isoelectric point of amino acids. Preparation and properties of amino acids - Tests for amino acids.

Peptides: Structure and nomenclature, Synthesis of polypeptides (General methods). Solid phase peptide synthesis. Structure determination of polypeptides- End group analysis.

Proteins: Classification of protein, Structure of protein (Determination of structure are not required). Protein de-naturation and re-naturation.

Nucleic Acids: Introduction, Constituents of nucleic acid, RNA and DNA, Types of RNA, Structure of DNA.

UNIT-IV REAGENTS AND THEIR APPLICATIONS 08 Hrs

Reagents and their applications in organic chemistry – Anhydrous $AlCl_3$, P_2O_5, H_2/ Pd- $BaSO_4$, Zn/ Hg- HCl and Ag_2O, Diazomethane, DDQ, DCC, LTA, $KMnO_4$, H_2O_2, CrO_3, MCPBA, $NaBH_2$.

UNIT- V MOLECULAR REARRANGEMENT 10 Hrs

Classification – Types of skeletal rearrangements - Anionotropic and cationotropic, Inter molecular and intra molecular rearrangements - Mechanisms, Migratory aptitude, Inter or intra molecular of the following rearrangements: Hofmann rearrangement, Beckmann rearrangement, Benzil-Benzilic acid rearrangement, Baeyer-Villiger, Fries rearrangement, Claisen rearrangement, Benzidine rearrangement, Curtius rearrangement, Wagner-Meerwein rearrangement and Wolff rearrangement.

Reference Books

- Morrison and Boyd, R.T. (2010). *Organic Chemistry.* VI Edition – Prentice Hall of India. New Delhi.
- Ahluwalia and Rakesh Kumar Parashar, V.K. (2011). *Organic Reaction Mechanisms.* Narosa Publishing House.

Text Books

- Soni, P.L. (2010). *Text Book of Organic Chemistry.* Sultan Chand.
- Bahl and Arun Bahl (2014). *Advanced Organic Chemistry.* S. Chand.
- Gurdeep Chatwal. (2010). *Chemistry of Natural Products.* Himalaya Publishing House.
- Finar, I. L (Volume - I)(2010). *Natural Products in Stereo Chemistry.* (VI ed.,).

e-Resources

- https://www.alchemyst.co.uk/pdf/Organic/rearrangements.pdf
- https://nptel.ac.in/content/storage2/courses/104101005/downloads/LectureNotes/chapter%2011.pdf
- https://application.wiley-vch.de/books/sample/3527317864_c01.pdf
- https://www.weizmann.ac.il/plants/aharoni/sites/plants.aharoni/files/uploads/june192007.pdf
- https://application.wiley-vch.de/books/sample/3527332014_c01.pdf
- http://www.chem.gla.ac.uk/staff/stephenc/teaching/HeterocycleLectures2011_2C12.pdf

PHYSICAL CHEMISTRY-II

UCHM609

Semester : VI **Credits : 4**
Category : Core XVI **Hours/Week : 4**
Class & Major: III-B.Sc. Chemistry **Total Hours : 52**

Objectives:
To Enable the Students

- Acquire the knowledge about the essential concepts of physical chemistry
- Analyze the various photophysical and photochemical processes
- Evaluate the physical concepts of molecular spectroscopy in molecular interaction

UNIT-I GROUP THEORY **12 Hrs**

VSEPR theory - Symmetry operations and symmetry elements (E, C_n, Σ, S_n, I) - Products of symmetry operations - Groups and properties of a groups - Classes and subgroups - Group multiplication table - Point groups.

UNIT-II PHOTOCHEMISTRY **08 Hrs**

Law of photochemistry, Jablonski diagram: Photophysical processes – Fluorescence and phosphorescence - Conditions for phosphorescence emission - Quantum yield – Determination of quantum yield. Kinetics of H_2-Cl_2 and H_2-Br_2 reactions - Basic concepts of photosensitization – Chemiluminescene and bioluminescence.

UNIT- III ELECTRO CHEMISTRY-I **12 Hrs**

Electrolytic conductance, Specific equivalent and molar conductance, Measurement – variation of conductance with dilution for strong and weak electrolytes, Kohlraush's law - Applications of conductivity measurements – Conductometric titrations - Ionic mobility-Transport number and its determination by Hittorff's and moving boundary methods - Debye-Huckel Onsager equation - Verification of Onsager equation, Wien effect and Debye-Falkenhagen effect.

UNIT-IV ELECTRO CHEMISTRY-II **13 Hrs**

Electrode potential**:** Standard electrode potentials, Reference electrodes–Primary and secondary reference electrode - Saturated calomel electrode – Importance of electrochemical series - Derivation of Nernst equation and its use in calculating EMF of cells - Relationship between EMF and (i) Free – energy changes (ii) Enthalpy changes (iii) Entropy changes - Liquid junction potential - Applications of EMF- Potentiometric titrations – Acid base and redox titrations.

UNIT-V PHYSICAL PRINCIPLES OF MOLECULAR SPECTROSCOPY **7 Hrs**

Doppler broadening - Line spectra and band spectra – Molecular spectra - Rotational spectra of diatomic molecules – Reduced mass – Relative intensities of rotational spectral lines - Vibrational spectra of diatomic molecules – Zero point energy – Electronic spectra: Franck-Condon principle – Electronic spectra of diatomic molecule.

Text Books

- Puri, Sharma and Pathania. (2010). *Principles of Physical Chemistry.* Shoban Lal Nagin Chand & Co. Jalandhar.
- Soni, P.L. (2011).*Text Book of Physical Chemistry*. Sultan Chand.
- Colin, N. Banwell & Elaine M. McCash. (2012). *Fundamentals of Molecular Spectroscopy*. (4th ed.,) Tata McGraw Hill Education Pvt. Ltd.

Reference Books

- Negi and Anand. (2010).*Physical Chemistry*. New Age International Publishers.
- Kundu and Jain. (2010). *Physical Chemistry*. S. Chand.

PHYSICAL CHEMISTRY III

UCHM613

Semester : VI **Credits : 04**
Category : Core XVII **Hours/Week : 04**
Class &Major: III-B.Sc. Chemistry **Total Hour : 52**

Objectives:

To Enable the Students

- Understand the Absorption spectroscopy
- Compare the NMR and Mass spectroscopy
- Distinguishthe energy and fuel cell

Learning outcomes:

On completion of the course, the student will be able to

- Acquires the basic knowledge of Nanochemistry.
- Understands the fundamentals of basic spectroscopic techniques.
- Applies the knowledge to control the water pollution, environmental and energy management systems.

UNIT -I UV VISIBLE-AND IR SPECTROSCOPY 12 Hrs

UV-visible spectroscopy: Woodward-Fieser rules - Types of electronic transitions - Effect of conjugation – Hydrogen bonding - Concepts of chromophore, auxochrome, bathochromic, hypsochromic, hyper chromic and hypochromic shifts.

Infra-red spectroscopy: Molecular vibrations, Hook's Law, Selection rules, Intensity and position of IR bands, Measurement of IR spectrum, Finger print region, Characteristic absorptions of various functional groups.

UNIT- II NMR SPECTROSCOPY AND MASS SPECTROMETRY 12 Hrs

Proton magnetic resonance (^{1}H NMR) spectroscopy: Magnetic and non-magnetic nuclei, Nuclear shielding and de-shielding, Chemical shift, Spin-spin splitting and coupling constants, Intensity of signals.

Mass spectrometry: Basic principle, Mass spectrum - Molecular ion peak – Base peak- Isotopic peak- Metastable peak- Nitrogen and ring rule - General fragmentation modes.

UNIT- III BASICS OF NANO CHEMISTRY 08 Hrs

Definition, Length scales and importance of nanoscale and its technology – Classification of nanomaterials (0D, 1D and 2D) - Self-assembly of materials – Self-assembled nanostructures – Porous solids-Carbon and zeolites, nanowires, nanomachines and quantum dots.

UNIT-IV ENERGY SYSTEMS **12 Hrs**

Batteries: Primary and secondary batteries - Difference between primary and secondary batteries - Chemistry of primary batteries such as zinc-carbon and alkaline - Secondary batteries such as lead acid, nickel cadmium, metal hydrides, lithium ion, lithium phosphate - Advantages, disadvantages, limitations of primary and secondary batteries.

Supercapacitor: Definition of capacitor, Supercapacitor, Specific capacitance, Charge and energy density - Working principle of supercapacitor- Types of supercapacitor- Symmetric, asymmetric and hybrid supercapacitor - Applications and limitations of supercapacitor.

Fuel Cell: Definition, Working principle and components of fuel cell – General characteristics, EMF and types of fuel cells - Advantages, disadvantages and applications of fuel cells.

UNIT- V APPLICATIONS OF SPECTROSCOPY **08 Hrs**

IR spectroscopy: Identification of functional groups - Interpretation of the spectra of alcohols, aldehydes, ketones and esters (Aliphatic and aromatic).

UV spectroscopy: Identification of conjugated dienes, trienes, unsaturated carbonyl compounds and aromatic compounds.

NMR spectroscopy: Interpretation of ^{1}H NMR spectra of ethyl bromide, ethanol and acetaldehyde.

Mass spectroscopy: Interpretation and fragmentation patterns of n-butane, 1-butanol and benzene, toluene - Mc-lafferty rearrangement of butanal and 2-pentanone.

Text Books

- Gregor Hoogers. (2003). *Fuel Cell Technology Handbook*. CRC Press.
- David Linden. (1984).*Handbook of Batteries and Fuel Cell*. McGraw-Hill Book Company.
- Dudley H Williams and Ian Fleming. (1984). *Spectroscopic Methods in Organic Chemistry.* (IV ed.,). Tata McGraw-Hill Publishing Company Ltd. New Delhi.

Reference Books

- Sharma, Y.R. (2013). *Elementary Organic Spectroscopy.* S. Chand & Company Ltd.
- Shanmugam, S. (2010). *Nanotechnology.* MJP Publishers. Chennai.
- Patrick Salomon. (2008). *A Handbook on Nanochemistry.* Dominant Publishers and Distributers. New Delhi.

e-Resources

- http://www.mssl.ucl.ac.uk/~gbr/workshop3/papers/Paerels_school_Mar17.pdf
- https://www.lehigh.edu/~kjs0/carey-13.PDF
- https://www.svce.ac.in/departments/chemistry/CITM/CY6151%20Notes%20PDF/Unit%20V%20-%20Nanochemistry.pdf
- http://folk.ntnu.no/fredrol/Nanomaterials%20and%20Nanochemistry.pdf
- https://www.who.int/water_sanitation_health/resourcesquality/watpolcontrol.pdf
- https://www.intechopen.com/books/water-challenges-of-an-urbanizing-world/water-pollution-effects-prevention-and-climatic-impact

POLYMER CHEMISTRY

UCHO602

Semester : VI **Credit : 4**
Category : Major Optional **Hours/Week : 5**
Class and Major: III B.Sc. Chemistry **Total Hours : 65**

Objectives:

- To provide students with an overview of the structure and composition of Polymers, types of polymerization and a working knowledge of polymer nomenclature
- To introduce students to polymer processing techniques.
- To expose students to the applications of polymers in everyday life.

UNIT-I INTRODUCTION TO POLYMERS **13 Hrs**

Monomers, oligomers, polymers and their characteristics **-** Classification of polymers - Natural, synthetic, linear, cross linked and network, plastics, elastomers, fibres, homopolymers and co-polymers **-** Bonding in polymers - Primary and secondary bond forces in polymers - Cohesive energy and decomposition of polymers. Molecular mass of polymers, M_n and M_w.

UNIT-II MECHANISM FOR POLYMERIZATION **11 Hrs**

Chain growth polymerization: Cationic, anionic, free radical polymerization, stereo regular polymers - Ziegler Natta polymers. Step growth polymers

UNIT-III TECHNIQUES OF POLYMERIZATION AND POLYMER DEGRADATION **11 Hrs**

Bulk, solution, suspension, interfacial and gas phase polymerization. Types of polymer degradation, thermal degradation, mechanical degradation, photo degradation, photo stabilizers.

UNIT-IV INDUSTRIAL POLYMERS **17 Hrs**

Raw material, preparation, fiber forming polymers, elastomeric material. Thermoplastics - Polyethylene, polypropylene, polystyrene, polyacrylonitrile, poly vinyl chloride, poly tetra fluoro ethylene, nylon and polyester. Thermosetting plastics - Phenol formaldehyde and expoxide resin. Elastomers - Natural rubber and synthetic rubber - Buna-n, buna-s and neoprene. Conducting polymers - Elementary ideas – Examples - Poly sulphur nitriles, polyphenylene, polypyrrole and polyacetylene.

UNIT-VINTRODUCTION TO POLYMER PROCESSING **13 Hrs**

Compounding - Polymer additives - Fillers, plasticizers antioxidants and thermal stabilizers fire retardants and colorants. Processing techniques - Calendaring, die casting, compression moulding, injection moulding, blow moulding, extrusion moulding and reinforcing.

Text Book:

- Gowariker, V.R. (1995). *Polymer Science*. Wiley Eastern.

Reference Books:

- Misra, G.S. (1996). *Introductory Polymer Chemistry*. New Age International (Pvt) Ltd.
- Kumar, A. & Guptha. S.K.(1978). *Fundamentals and Polymer Science & Engineering*. Tata McGraw-Hill.
- Billmeyer, F.N. (1971). *Textbook of Polymer Science.* Wiley Inter science.

MEDICINAL CHEMISTRY

UCHO603

Semester : VI **Credits : 4**
Category : Major Elective **Hours/Week: 5**
Class & Major: III-B.Sc. Chemistry **Total Hours: 65**

Objectives:

To Enable the Students

- Understand the essential concepts of Medicinal chemistry
- Categorize various drug candidates and its mechanism of action
- Design and synthesize drug molecules by appropriate chemical moieties

UNIT-I INTRODUCTION 16 Hrs

Important terminology used in medicinal chemistry - Mechanism of action of drugs - Metabolism of drug. Naming of drugs - Assay in general. Drug and their mode of action - Causes of common disease and their treatment by drugs – Encapsulation. Indian medicinal plants - Traditional practice. Testing of potential drugs using experimental animals - Clinical trial and wide spread use after the approval – Side effects.

UNIT-II ANTIBIOTICS 15 Hrs

Synthesis, assay and uses of chloramphenical, streptomycin and penicillin. Structural features – SAR – Functional group responsible for drug action – Structural modification that enhance and retard the potency (for the above drugs). Action of drug - Drug action and physiochemical properties, hydrophobicity, electronic effect, steric effect.

UNIT-III ANTIPYRETICS AND ANALGESICS 10 Hrs

Classification - Action of analgesics - Narcotics analgesics – Morphine and its derivatives with reference to SAR - Synthetic analgesics – Pethidines and methadones. - Antipyretic analgesics – Salicylic acid derivates, indolyl derivatives and p-amino phenol derivatives – Mechanism of action.

UNIT-IV NARCOTICS AND NON NARCOTICS 13 Hrs

Tranquilizers - Sedatives - Psychedelic drugs (LSD), Antineo plastic and hypoglycemic drugs – Diabetics - Cause and control - Organic pharmaceutical aids and their role as preservatives, antioxidants, colouring, flavouring and sweetening agents, emulsifying agents - Stabilizing and suspending agents – Ointment bases.

UNIT-V SYNTHESIS OF DRUGS AND CHEMICAL USES 11 Hrs

Procaine hydrochloride, meprobamate, oxy-phenbutazone, hydralazine hydrochloride, methyl dopa, propranolol hydrochloride, iso propamide iodide, chloropheniramine maleate, indomethacin and ibuprofen.

Text books

- Sudha, P.N. (1998). *Applied Chemistry*. Supra Associates Vellore.
- Jayashree Ghosh. (1999). *Fundamental Concepts of Applied Chemistry*.S.Chand Publications.

Reference books

- Billmeyer, F. (2002). *Textbook of Polymer Science*. New Age international.

FORENSIC CHEMISTRY

UCHO604

Semester : VI **Credit : 4**
Category : Major Elective **Hours/Week : 5**
Class&Major : III-UG **Total Hours : 65**

Objectives:

To enable the students

- Identify the food contamination and food poisons
- Examine suitable method for detecting the crime, forgery and medical aspects

UNIT- I FOOD ADULTRATION 15 Hrs

Contamination of wheat, rice, dhal, milk, butter - With clay, sand, stone, water and toxic chemicals (e.g. kasseri dhal with mentanil yellow). Food poisons - Natural poisons (alkaloids, nephrotoxins), pesticides (DDT, BHC, follidol), chemical poisons (KCN). First aid and antidotes for poisoned persons. Heavy metal (Hg, Pb, Cd) contamination of sea food. Use of neutron activation analysis in detecting poisoning (e.g., as in human hair).

UNIT –II TRANSPORTATION 10 Hrs

Drunken driving - Breath analyzer for ethanol. Incendiary and timed bombs in road and railway tracks. Defusing live bombs. Hit and go traffic accidents - Paint analysis by AAS. Soil of toxic and corrosive chemicals (e.g., conc.acids) from tankers.

UNIT- III CRIME DETECTION 15 Hrs

Accidental explosions during manufacture of matches and fire-works (as in sivakasi). Human bombs, possible explosives (gelatin sticks,rdx). Metal detector devices and other security measures for VVIP. Composition of bullets and detection of powder burns. Scene of crime: finger prints and their matching using computer records. Smell tracks and police dogs. Analysis of blood and other body fluids in rape cases.typing of blood.dna fingerprinting for tissue identification in dismembered bodies. Blood stains on clothing.cranial analysis (head and teeth).

UNIT-IV FORGERY AND COUNTER FEITING **13 Hrs**

Detecting forgery in bank cheques/drafts and educational records (mark lists, certificates), using UV-light. Alloy analysis using AAS to detect counterfeit coins. Checking silver line water mark in currency notes. Jewelers- detection of gold purity in 22 carat ornaments, detecting gold plated jewels, authenticity of diamonds (natural, synthetic, glassy).

UNIT-VMEDICAL ASPECTS **12 Hrs**

Misuse of scheduled drugs. Burns and their treatment by plastic surgery. Metabolite analysis, using mass spectrum – Gas chromatography. Detecting steroid consumption among athletes and race horses.

Text Books

- Richard Safestein. and Criminalistics. (2014). *An Introduction to Forensic Science (College Version).* Pearson Pentice Hall.
- James, S. H. and Jon J Noard. (2009).*Forensic Science: An Introduction to Scientific and Investigative Techniques.*CRC Press.

Reference Books

- Ngaire E. Genge.(2008).*The Forensic Casebook. The Science of Crime Scene Investigation.* Ebury Digital.

DYES AND TEXTILE FIBER

UCHO605

Semester : VI **Credits : 4**
Category : Major Elective **Hours/Week: 5**
Class & Major: III-UG **Total Hours: 65**

Objectives:

To Enable the Students

- Understand the various dye molecules and its properties
- Categorize the preparation and properties of fibers, polymers, dyes and its applications

UNIT – I DYES AND DYE INTERMEDIATES **10 Hrs**

Classification of dyes (based on their use and on their structures) – Classes of dyes for dyeing on different fabrics (natural and manmade). Important dyestuff intermediates – Their names and structures. General properties of dye stuff – Linearity, coplanarity, fastness properties, fluorescene, optical brighteners.

UNIT – II FIBER SCIENCE **15 Hrs**

Fiber classification – Properties (count, denier, tex, staple length, spinning properties, strength, elasticity and creep) natural fibres – Cotton, wool, silk – General characteristics. Synthetic fibres – Polyamide fibre (nylon 66 – preparation nylon degradation) – Polyester fibre (preparation, degradation) – Polyacrylonitrile fibre (preparation, properties) – Viscose (preparation and properties). Identification tests for cellulose, cotton, wool, silk, rayon, acrylic,viscose, polyamide and polyester fibres.

UNIT – III DYE APPLICATIONS-I PRE TREATMENTS 15 Hrs

Sizing and desizing – Purpose – Desizing methods (hydrolytic and enzymatic). Scouring – Purpose – Kier boiling – Alkali scouring – Acid scouring – Principles involved in these methods. Bleaching – Methods (hypochlorite, peroxide and bleaching powder bleaching).

UNIT – IV DYE APPLICATIONS- II PRINCIPLES OF DYEING 15 Hrs

Dye bath preparation – M.L.ratio – Fixation of dye and additive concentration on the basis of weight of the material – Methods of expressing the concentrations in dye bath (GPL). dyeing assistants – Wetting agent (TR oil – Preparation and purpose) – Anionic and non-ionic detergents (examples, functions) - Leveling agents (examples, functions) – Fasters improvers (example functions) – Dispersing agents (examples, functions) – Exhausting agents (examples, functions) – Mordants – Ingrain. Dye bath receipe model (Dyeing of cotton with reactive dyes, sulfur dyes, aboicdyes – Dyeing of polyester with disperse dyes with and without carriers, dyeing of silk with metal - Complex dyes).

UNIT – V DYE APPLICATIONS – II 10Hrs

Vat dyeing – classification of vat dyes – Vatting – Dyeing procedure – Exhaution in vat dyeing – Oxdation. Reactive dyeing – Hot and cold brand – Principles involved in the dyeing process – Batch and continuous processes. Dyeing of polyester and blends – Function of dispersing agents – Fiber swelling – Carrier dyeing – High temperature dyeing – Selection of dye stuff.

Text Books

- Shenai, V.A. (1984). *An Introduction to Dye Stuff and intermediates.* Sevak Publications. Wadela. Bombay.
- Abrahard, E.N. (1989). *Outlines of Chemistry of Dye Staff and Intermediates*. Chemical Publishing. New York.

Reference Book

- Chatwal and Anan. (2009). *Synthetic Organic Dyes.* Himalaya Publishing House.

ORGANIC ANALYSIS AND PREPARATION

UCHR606

(This Replaces the Course UCHR602 Organic Analysis Found in Academic Council Booklet-II)

Semester: VI **Credit :4**
Category: Core Practical - V **Hours/Week : 4**
Total Hours : 52

Objectives:

To Enable the Students

- Analyze the special element and functional group present in the given organic compound.
- Acquire skill to prepare the organic compound.

I) Organic preparations:

1. Oxidation (Benzaldeyde to benzoic acid).

2. Hydrolysis (Methyl salicylate or Ethyl benzoate to the acid).
3. Nitration (meta-Dinitrobenzene or picric acid).
4. Halogenation (para-Bromoacetanilide from acetanilide).
5. Diazotisation (Methyl orange).
6. Acylation (Benzoylation of betanaphthol).

II) Micro level organic analysis:

Reaction of the following functional groups:

Aldehyde, Ketone, Carboxylic Acid (Mono and Di), Ester, Carbohydrate (Reducing), Phenol, Aromatic primary amine, Amide, Nitro compounds and anilide. Analysis of organic compound containing one functional group and characterization with a derivative.

Text Books

- Venkateswaran. V, Veeraswamy. R. & Kulandaivelu, A. R. (1998*).Basic Principles of Practical Chemistry.* S. Chand & Sons Publications.

Reference Books

- Thomas, A. O. (1999). *Practical Chemistry.* Scientific Book Center. Cannanore.
- Sundaram, S.(1998).*Practical Chemistry.*(3rdVol).
- Vogel's. (1998) *Text Book of Practical Organic Chemistry.* Longman.

GREEN CHEMISTRY
UCHS601

Semester : VI | **Credit : 1**
Category : Self Study | **Hours/ week : 2**
Class & Major : III B.Sc. Chemistry | **Total Hours : 26**

Objectives:

To Enable the Students

- Trace the Principles of Green Chemistry and its Development
- Evaluate the Green Synthetic Routes for Solvent Free Reactions

UNIT-I INTRODUCTION **10 Hrs**

Definition - The current status of chemistry and the environment - Evolution of the environmental movement - The role of chemists and goals - Prevent waste - Synthetic methods to design - Awareness of toxicity and their chemical products.

UNIT –II EXAMPLES OF GREEN CHEMISTRY **08 Hrs**

Green reactions - Green reagents - Green solvents and reaction conditions - Green chemical products.

UNIT – III FUTURE TRENDS IN GREEN CHEMISTRY **08 Hrs**

Oxidation reagents and catalysts – Biomimetic - Multifunctional reagents- Combinatorial green chemistry - Current pollution problems - Energy focus.

Text Book

- Dr. Kidwai (1997). *Green Chemistry Theory & Practice.* Boston, December.

Reference Books

- Collins ,T.J. (1996). *Green Chemistry* in Mac Millan Encyclopedia of Chemistry, MacMillan Inc. New York.
- Anastas, P.T. and Williamson. T.C. (1996). *Green Chemistry.* Oxford Univ. Press.
- Breslow, R. (1998). *Chemistry Today and Tomorrow*. American Chemical Society, Washington. DC.

III and IV EVALUATION COMPONENT OF CIA

Semester	Course Code	Course Title	Component-III	Component-IV
V	UCHM508	Inorganic Chemistry I	Assignment	Seminar
V	UCHM509	Organic Chemistry I	Reaction Writing (Chemdraw)	Seminar
V	UCHM506	Physical Chemistry I	Problem Solving	Seminar
VI	UCHM611	Inorganic Chemistry II	Poster	Seminar
VI	UCHM612	Organic Chemistry II	Mechanism Writing	Seminar
VI	UCHM609	Physical Chemistry II	Problem Solving	Seminar
VI	UCHM613	Physical Chemistry III	Assignment	Seminar
VI	UCHO602 UCHO603 UCHO604 UCHO605	Polymer Chemistry Medicinal Chemistry Forensic Chemistry Dyes and Textile Fiber	Assignment	Seminar

PROGRAMME PROFILE M.Phil (Chemistry)

(With Effect From2020-2021 Batch Onwards)

Semester	Category	Course Code	Course Title	Hrs per Week	Credit
I	Core I	MCHM105	Research Methodology	6	5
	Core II	MCHM106	Instrumental Methods of Analysis	6	5
	Core III	MCHM107	Special Area of Study	-	5
	Core IV	MRPE101	Research and Publication Ethics (RPE)	-	2
II	Core V	MCHD201	Dissertation & Viva voce	-	13
Total					**30**

- **Paper Presentation (Minimum One) &**
- **Publication of Articles in Journals (Minimum One) areMandatory for Submission of Dissertation.**

III & IV EVALUATION COMPONENTS OF CIA

Semester	Course Code	Course Title	Component III	Component IV
I	MRPE101	Research and Publication Ethics (RPE)	Assignment	Tutorials

DEPARTMENT OF MATHEMATICS

PREAMBLE

UG **:** Programme Profile and the syllabi of courses offered in the V and VI semester along with evaluation components III&IV (With effect from 2018-2021batch onwards)

PROGRAMME PROFILE B.Sc., Mathematics

PROGRAMME SPECIFIC OUTCOMES (PSO)

Upon Completion of the Programme, the Students will able to

- Interprete the effective use of mathematical skills to solve quantitative problems from a wide array of authentic contexts.
- Ability to apply rigorous 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	Language	UTAL105/ UTAL106/ UHIL102/ UFRL102	Basic Tamil-I/Advanced Tamil-I/Hindi-I / French-I	UTAL103/ UTAL104/ UHIL101/ UFRL101	4	2/3
	II	English	UENL107/ UENL108	General English-I/ Advanced English-I	UENL106	5	3/4
	III	Core I	UMAM107	Fundamentals of Mathematics	UMAM103	2	1
	III	Core II	UMAM104	Differential Calculus	-	5	4
	III	Core III	UMAM106	Analytical Solid Geometry	UMAM105	6	5
	III	Allied	UMAA111	Mathematical Statistics	-	6	5
	IV	Value Education				2	1
TOTAL						**30**	**21/23**
II	I	Language	UTAL205/ UTAL206/ UHIL202/ UFRL202	Basic Tamil II/ Advanced Tamil-II/ Hindi-II /French-II	UTAL203/ UTAL204/ UHIL201/ UFRL201	4	2/3
	II	English	UENL207/ UENL208	General English II/ Advanced English II	UENL 206	5	3/4
	III	Core IV	UMAM204	Integral Calculus	-	5	5
	III	Core V	UMAM205	Graph Theory	UMAM402	5	4
	III	Core VI	UMAM206	Discrete Mathematics	UMAM606	5	4
	IV	Non Major				4	2
	IV	Soft Skill				2	1

	V	Extension Programme/ Physical Education				-	1/2
					TOTAL	**30**	**22/25**
III	I	Language	UTAL305/ UTAL306/ UHIL302/ UFRL302	Basic Tamil III/ Advanced Tamil-III/ Hindi-III /French-III	UTAL303/ UTAL304/ UHIL301/ UFRL301	4	2/3
	II	English	UENL307/ UENL308	Basic English III/ Advanced English III	UENL306	5	¾
	III	Core VII	UMAM306	Differential Equation	UMAM302/ UMAM301	5	4
	III	Core VIII	UMAM307	Introduction to Probability Theory	-	5	5
	III	Allied	UCSA303	Mathematical Programming in C	-	3	3
	III	Allied Practical	UCSR305	Mathematical Programming in C Practical	-	3	2
	IV	Online Course (NPTEL/ SP)	UMAV381			3	1/2
	IV	Value Education				2	1
					TOTAL	**30**	**21/24**
IV	I	Language	UTAL405/ UTAL406/ UHIL402/ UFRL402	Basic Tamil IV/ Advanced Tamil-IV/ Hindi-IV/French-IV	UTAL403/ UTAL404/ UHIL401/ UFRL401	4	2/3
	II	English	UENL407/ UENL408	Basic English IV/ Advanced English IV	UENL406	5	3/4
	III	Core IX	UMAM405	Applications of Transforms	-	4	3
	III	Core X	UMAM406	Mechanics	UMAM401	4	4
	III	Core XI	UMAM404	Mathematical modeling	-	4	4
	III	Core XVI	UMAP501 / UMAR511	Project/ R Programming	-	2	-
	III	Allied	UPHA402	Electronics for Mathematics	-	3	3
		Allied Practical	UPHR402	Electronics for Mathematics Practical	-	2	2
	IV	Soft Skill				2	1
	V	Extension programme/ Physical Education				-	-/2
					TOTAL	**30**	**22/26**
V	III	Core XII	UMAM507	Modern Algebra	UMAM501	6	5
	III	Core XIII	UMAM512	Real Analysis I	UMAM508	6	5
	III	Core XIV	UMAM506	Number Theory	UMAM502	6	5
	III	Core XV	UMAM510	Numerical Methods	-	6	5
	III	Core XVI	UMAP501/ UMAR511	Project/ R Programming	-	4	4/5
	IV	Value				2	1

		Education					
					TOTAL	**30**	**25/26**
VI	III	Core XVII	UMAM614	Linear Algebra	UMAM610	5	5
	III	Core XVIII	UMAM615	Real Analysis II	UMAM611	6	6
	III	Core XIX	UMAM602	Complex Analysis	UMAM509	6	6
	III	Core XX	UMAM613	Operations Research	UMAM608	6	6
	III	Major Elective	UMAO607	Mathematics in Space Science	UMAM612	5	4
			UMAO606	Mathematics for Construction Craft	-		
	III	Comprehensive Viva	UMAM601			-	1
	IV	Soft Skill				2	1
	V	Extension programme/ Physical Education				-	-/2
TOTAL						**30**	**29/31**
GRAND TOTAL						**180**	**140/155**

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 B Com (CA)	I	Allied	UMAA112	Business Mathematics	-	5	4
I B.Sc PHY			UMAA114/ UMAA312	Allied Mathematics I	UMAA106	5	5
I BCA			UMAA110	Mathematical Methods I	-	5	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		5	4
I B.Sc PHY			UMAA222	Allied Mathematics II	UMAA212	5	5
II B.ScChem	III		UMAA312/ UMAA114	Allied Mathematics I	UMAA310	5	5
II B.Sc BIO			UMAA305	Bio-Statistics	-	5	4
II BBA/ II B.Com/ II B.Com CA			UMAA301	Business Statistics	UMAA211/ UMAA403/ UMAA107	5	4
II B.ScChem	IV		UMAA406	Integral Calculus, Laplace Transform And Ordinary Differential Equations	-	5	5
II BBA			UMAA410	Quantitative techniques for Business	UMAA505	5	4

NON-MAJOR ELECTIVE

Semester	Part	Category	Course Code	Course Title	Previous course code	Contact Hrs/ week	Credit
II	IV	Non Major Elective	UMAE204	Basic Mathematics for Science	-	4	2
			UMAE202	Mathematics for Business and Decision Making	-	4	2
			UMAE206	Numerical Methods using C++	UIDE302/ UMAE302	4	2
			UMAE209	Operations Research for Managers	UMAE306/ UMAE402	4	2
			UMAE207	Statistical Data Analysis through SPSS	UMAA501/ UMAE305	4	2
			UMAE208	Applied Mathematics	UMAE309/ UMAE502	4	2

EXTRA CREDIT EARNING PROVISION

Semester	Part	Category	Course code	Course Title	Contact Hrs/ week	Credit	
						Min	Max
II	III	Self Study paper	UMAI201	Summer Internship	-	-	1
IV	III	Self Study paper	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	Hours/ Days/ Month	Mode of Evaluation
I	UMAA111	Mathematical Statistics	Component IV	Applied Statistics Certification	2 Days	Reflection

SKILL ORIENTATION PROGRAMME (Only for Interested students) –
Extra Credit Earning Provision

Sem	Category	Course Code	Course Title	Collaborating Agency	Hours/ Days/ Month	Mode of Evaluation	Credits (Min/Max)
II	Core	UMAT201	Statistics Process Control	**MSME**	4 Days	Reflection	1

MODERN ALGEBRA

UMAM507

Semester : V **Credits : 5**
Category : Core XII **Hours/Week : 6**
Class & Major: III B.Sc Mathematics **Total Hours : 78**

Objectives:
To enable the students

- Understand the Algebraic structures such as Groups, Rings and Ideals
- Compare the operations of Group structures with Rings and Ideals.
- Solve the problems based on the basic algebraic structures.

Learning Outcomes:
On completion of the course, the student will be able to

- Write the abstract mathematical proofs in a clear and logical manner.
- Locate and use theorems to solve problems in number theory and theory of polynomials over a field.
- Present the Relationships between abstract algebraic structures with familiar numbers.
- Demonstrate capacity for mathematical reasoning through analyzing, proving, and explaining concepts.

UNIT-I GROUP **15 Hrs**

Definition of a Group – Some Preliminary Lemmas – Subgroups.
Chapter-2: Sec 2.1 – 2.4

UNIT-II NORMAL SUBGROUPS **15 Hrs**

Counting Principle, Normal subgroups and quotient groups, Homomorphism.
Chapter-2: Sec 2.5 – 2.7

UNIT-III AUTOMORPHISMS **15 Hrs**

Automorphisms - Cayley theorem - Permutation Groups.
Chapter-2: Sec 2.8 – 2.10

UNIT-IV RINGS **18 Hrs**

Definition and examples – Some special classes of Rings – Integral Domain – Homomorphisms of Rings- Ideals and Quotient Rings- More Ideals and Quotient Rings.
Chapter-3: Sec 3.1 – 3.4

UNIT-V IDEALS **15 Hrs**

The field of an integral domain – Euclidean ring- Polynomial rings.
Chapter-3: Sec 3.5 – 3.7

Text Book

- Herstein,I.N. (2013). *Topics in Algebra*. John Wiley & Sons Publishers. (2^{nd} ed.,). Asia.

Reference Books

- Santiago,M.L. (2001). *Modern Algebra*.Tata McGraw-Hill Publishing Co. Chapters 1-4 except the section 2.3 and 2.12
- John Fraleigh,B.(2003). *A first course in Abstract Algebra*. Addison Wesley publishing Co.(7^{th} ed.,).

E- Resources

- http://matterhorn.dce.harvard.edu/engage/ui/index.html#/1999/01/82345
- https://ocw.mit.edu/courses/mathematics/18-703-modern-algebra-spring-2013/lecture-notes/

REAL ANALYSIS I

UMAM512

Semester : V **Credits : 5**
Category : Core XIII **Hours/Week : 6**
Class & Major: III B.Sc Mathematics **Total Hours : 78**

Objectives:
To enable the students

- Gain the Knowledge of Sequences and Series of real numbers.
- Understand the concept of Metric Spaces and, differentiate the sets and functions defined on it
- Illustrate the Sequences and Series, and analyze them.

Learning Outcomes:
On completion of the course, the student will be able to

- Describe the Fundamental Properties of the real numbers.
- Demonstrate an understanding of the sequence and series, continuity etc
- Apply the theory in the course to solve a variety of problem at an appropriate level of difficulty
- Using skills in communicating mathematics.

UNIT-I FUNCTIONS **15 Hrs**

Functions – Real valued functions – Equivalence – Countability and Real numbers – Least Upper Bound.
Chapter 1: Sec: 1.4 to 1.7

UNIT-II LIMITS OF SEQUENCES **15 Hrs**

Definition – Subsequence – Limit of a Sequence – Convergent Sequence – Divergent Sequence – Bounded Sequence – Monotone Sequence.
Chapter 2: Sec: 2.1 to 2.6.

UNIT-III CONVERGENT SEQUENCES AND SERIES **16 Hrs**

Operations on Convergent Sequence - Operations on Divergent Sequence – Limit Superior and Limit Inferior – Cauchy Sequence.

Series: Convergence and Divergence – Series with Non- negative terms – Alternating Series – Conditional Convergence and Absolute Convergence.

Chapter 2: Sec: 2.7 to 2.10 **Chapter 3:** Sec: 3.1 to 3.4

UNIT-IV REARRANGEMENT OF SERIES **16 Hrs**

Rearrangement of series – Tests for Absolute Convergence – Series whose terms form a Non – decreasing sequence – Summation by parts. Limits and Metric Spaces: Limit of a function of the real line – Metric space – Limits in metric spaces.

Chapter 3: Sec: 3.5 to 3.8 **Chapter 4:** Sec: 4.1 to 4.3

UNIT-V CONTINUOUS FUNCTIONS ON METRIC SPACES **16 Hrs**

Functions continuous at a point on the real line – Reformulation - Functions Continuous on a Metric Spaces – Open Sets – Closed Sets.

Chapter 5: Sec: 5.1 to 5.5

Text Book

- Goldberg,R. (2009). *Methods of Real Analysis*. Oxford & IBH Publishing Co. New Delhi.

Reference Books

- Tom Apostol, M. (2004). *Mathematical Analysis.* Addison –Wesley New York (4^{th} ed.,).
- Malik,S.C. and Savita Arora. (2010). *Mathematical Analysis.*Wiley Eastern Limited New Delhi.
- Sanjay Arora and BansiLal. (2000). *Introduction to Real Analysis*. SatyaPrakashan. New Delhi.

E- Resources

- http://nptel.ac.in/courses/122104017/

NUMBER THEORY

UMAM506

Semester : V **Credits : 5**
Category : Core XI **Hours/Week : 6**
Class &Major: III B.Sc Mathematics **Total Hours : 52**

Objectives:

To enable the students

- Acquire basic knowledge in Number System.
- Apply the properties of various functions of Number System.
- Apply the concepts of Number theory in the field of Algebra and Cryptography.

Learning Outcomes:

On completion of the course, the student will be able to

- Construct Mathematical Proofs and Statements and find counterexamples to false statements

- Collect and use numerical data to form conjectures about the integers
- Express the concept and results
- Apply Euclid`s Algorithm

UNIT-I THE FUNDAMENTAL THEOREM OF ARITHMETIC 10 Hrs

Introduction – Divisibility - Greatest common divisor - Prime numbers – The fundamental theorem of arithmetic- The series of reciprocals of the primes – The Euclidean algorithm - The greatest common divisor of more than two numbers.

Chapter-1. Section:1.1-1.8.

UNIT-II ARITHMETICAL FUNCTIONS 10 Hrs

Introduction – The mobius function (n) – The Euler totient functionμ (n) – Aϕ relation connecting ϕ and – A product formula for μ(n) – The Dirichlet of arithmeticalϕ functions – Dirichlet inverses and the mobius inversion formula - Multiplicative functions.

Chapter-2. Section:2.1-2.9.

UNIT-III DIRICHLET MULTIPLICATIONS 12 Hrs

Multiplicative functions and Dirichlet Multiplication -The inverse of a completely multiplicative function – Lioville's function - The division function-Generalised convolutions - Formal power series - The bell series of an arithmetical functions - Bell series and Dirichlet multiplication. - Derivatives of arithmetical functions - The Selberg identity.

Chapter-2. Section:2.10-2.19.

UNIT –IV CONGRUENCES 10 Hrs

Congruences - Definition and basic properties of Congruences – Linear congruence - Reduced residue systems and The Euler-Fermat theorem - Polynomial Congruences modulo p Lagrange theorem - Application of Lagrange's theorem - Simultaneous linear congruences - The Chinese remainder theorem - Applications of the Chinese remainder theorem.

Chapter-5. Section:5.1-5.8.

UNIT-V QUADRATIC RESIDUES AND DIRICHLET SERIES 10 Hrs

Quadratic residues and the quadratic reciprocity lemma - Evaluation of (-1/p) and (2/p) - Gauss lemma - The quadratic reciprocity law - introduction - The half-plane of absolute convergence of a Dirichlet series - The function defined by a Dirichlet series - Multiplication of Dirichlet series.

Chapter-9. Section:9.3-9.5 Chapter-11. Section:11.1-11.4.

Text Book

- Tom Apostol, M. (2000).*Introduction to Analytic Number Theory*. Springer-Verlag. New York.

Reference Books

- Neal Koblitz. (1987). *A Course in Number Theory and Cryptography.* Springer-Verlag. New York.
- John Stillwell.(2006). *Elements of Number Theory. Springer* – Verlag. New York.

- Ivan Niven Herbert Zuckerman,S. and Hugh Montgomery,L. (2008). *An Introduction to the Theory of numbers*.Wiley .(5^{th} ed.,). India.

NUMERICAL METHODS

UMAM510

Semester :V **Credits : 5**
Category :XV **Hours/Week: 6**
Class & Major: III B.Sc Mathematics **Total Hours: 78**

Objectives:
To enable the students

- Introduce the basic concepts of algebraic and transcendental equations.
- Understand the numerical techniques of differentiation and integration.
- Acquaint the knowledge of various techniques and methods of solving ordinary and partial differential equations.

Learning Outcomes:
On completion of the course, the student will be able to

- Demonstrate understanding of numerical methods and how they are used to obtain approximate solutions.
- Apply numerical methods to find out solution of algebraic equations using different methods under different conditions, and numerical solution of system of algebraic equations.
- Work out numerical differentiation and integration whenever and wherever routine methods are not applicable.
- Apply various interpolation methods and finite difference concepts

UNIT-I SOLUTION OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS 15 Hrs

Solution of algebraic and transcendental equations - Fixed point iteration method – Newton Raphson method.
Chapter: 3

UNIT- II SOLUTION OF LINEAR SYSTEM EQUATIONS & EIGENVALUE PROBLEMS 16 Hrs

Solution of linear system of equations - Gauss Elimination method –Pivoting - Gauss-Jordan methods -Iterative methods of Gauss-Jacobi and Gauss-Seidel -Matrix Inversion by Gauss-Jordan method – Eigen values of a matrix by Power method and by Jacobi`s method.
Chapter : 4,13 (Sec 13.1-13.2)

UNIT- III INTERPOLATION AND APPROXIMATION 15 Hrs

Interpolation with unequal intervals - Lagrange interpolation – Newton`s divided difference interpolation – Cubic Splines - Interpolation with equal intervals – Newton`s forward and backward difference formulae – Least square method - Linear curve fitting.
Chapter: 7 & 8

UNIT- IV NUMERICAL DIFFERENTATION AND INTEGRATION 16 Hrs

Approximation of derivatives using interpolation polynomials - Numerical integration using Trapezoidal, Simpson`s 1/3 and Simpson`s 3/8 rules – Romberg`s method - Two point and three point Gaussian quadrature formulae – Evaluation of double integrals by Trapezoidal and Simpson`s rules.

Chapter : 9

UNIT-V INITIAL VALUE PROBLEMS FOR ORDINARY DIFFERENTIAL EQUATIONS 16 Hrs

Single step-methods – Taylor`s series method – Euler`s method - Modified Euler`s method -Fourth order Runge - Kutta method for solving first and second order equations - Multi-step methods – Milne`s and Adams-Bash forth predictor-corrector methods for solving first order equations.

Chapter:11

Text Books

- Grewal, B.S. and Grewal, J.S. (2007). *Numerical methods in Engineering and Science.* Khanna Publishers.(9^{th} ed.,).India.
- Kandasamy, P.Thilagavathy, K.and Gunavathy, K. (2009). *Numerical Methods*. S.Chand & Company limited. New Delhi.

References

- Sastry, S.S.(2002). Introducing Methods of Numerical Analysis. Prentice Hall of India. (3^{rd}.,). New Delhi.
- Brian Bradie. (2007). Friendly Introduction to Numerical Analysis. Pearson Education.(1sted.,). Asia.
- Gerald, C.F. and Wheatley, P.O.(2006). Applied Numerical Analysis. Pearson Education. (6th ed.,). New Delhi.

E-Resources:

- http://textofvideo.nptel.iitm.ac.in/video.php?courseId=111101003&p=3
- http://textofvideo.nptel.iitm.ac.in/video.php?courseId=111101003&p=1
- http://textofvideo.nptel.iitm.ac.in/video.php?courseId=111101003&p=1
- http://textofvideo.nptel.iitm.ac.in/video.php?courseId=111101003&p=4
- http://freevideolectures.com/Course/3277/Numerical-methods-of-Ordinary-and-Partial-Differential-Equations

PROJECT

UMAP501

Semester	**: V**	**Credits**	**: 5**
Category	**: Core X**	**Hours/Week**	**: 2+4**
Class & Major:	**III B.Sc Mathematics**	**Total Hours**	**: 78**

Objectives:
To enable the students

- Acquire knowledge in Mathematical research.
- Develop problem solving and decision making skills.

Learning Outcomes:
On Completion of the course, the students will be able to

- Identify practical problem, solve using the Mathematical techniques.
- Provide students a hands-on experience of Designing, Performing, and Analyzing results from a Application Oriented project.

Guidelines

- Project is offered for final year B.Sc Mathematics students in Semester VI.
- Project can be done according to area of interest.
- Project should do either as individual or as group with maximum of three /four students.
- Project can be field study, survey, extraction of components from Real life and application oriented.
- Evaluation scheme for the project will be Internal 60 and External40.

Assessment

S. No	**Internal**		**External**	
	Component	**Marks**	**Component**	**Marks**
1	Review of the Literature	10	Dissertation	10
2	Area of Research	10	Presentation	20
3	Methodology	10	Viva - voce	10
4	Statistical Tool	10		-
5	Result and Discussion	10		-
6	Report preparation	10		-
	Total	**60**		**40**
	Maximum marks	100		

LINEAR ALGEBRA

UMAM614

Semester : VI **Credits : 5**
Category : Core XVII **Hours/Week : 5**
Class & Major: III B.Sc Mathematics **Total Hours : 65**

Objectives:
To enable the students

- Understand the concepts of Vector spaces, linear transformations and Matrix Algebra.
- Solve system of linear equations and assess the nature of solutions.
- Compute determinants and canonical forms of a matrix.

Learning Outcomes:
On completion of the course, the student will be able to

- Do elementary matrix operations
- Recognize and use equivalent statements regarding invertible matrices, pivot positions, and solutions of homogeneous systems.
- Interpret existence and uniqueness of solutions geometrically.
- Perform common matrix operations such as addition, scalar multiplication, multiplication and transposition.

UNIT-I VECTOR SPACES & DUAL SPACES 13 Hrs

Elementary Basic Concepts – Linear Independence and bases- Dual Spaces- Inner Product Spaces.

UNIT-II INNER PRODUCT SPACES& LINEAR TRANSFORMATION 13Hrs

Modules-The Algebra of Linear Transformation- Characteristic Roots.

UNIT-III MATRIX & CANONICAL FORMS 13Hrs

Matrix -Canonical forms: Triangular forms-Nilpotent Transformations-Decomposition of V:Jordon forms.

UNIT-IV MATRIX OPERATIONS 13Hrs

Trace and Transpose – Determinants.

UNIT-V HERMITIAN-UNITARY & NORMAL TRANSFORMATIONS 13Hrs

Hermitian-Unitary & Normal Transformations-Real Quadratic forms

Text Book

- Devi Prasad. (2016). *Elementary linear Algebra*. Narosa publishing company. (3^{rd} ed.,).

Reference Books

- Kumaresan, S. (2000). *Linear Algebra A geometric Approach.* PHI Learning Private Limited.(10^{th} ed.,). New Delhi.
- Herstein,I.N. (2013). *Topics in Algebra*. John Wiley & Sons inc.(2^{nd}ed.,).
- Kenneth Hoffmann, and Ray Kunze.(2014). *Linear Algebra*. (2^{nd} ed.,).
- John Fraleigh,B. (2003). *A first course in Abstract Algebra*. Addison Wesley publishing Co. (7^{th} ed.,).

E- Resources

- http://nptel.ac.in/courses/111106051/
- https://www.khanacademy.org/math/linear-algebra

REAL ANALYSIS II

UMAM615

Semester : VI **Credits : 6**
Category : Core XVIII **Hours/Week : 6**
Class & Major: III B.Sc Mathematics **Total Hours :78**

Objectives:
To enable the students to

- Understand the sequence and series of functions, and fundamental properties of real numbers.
- Construct rigorous mathematical proofs of basic results in real analysis.
- Apply principles of real analysis to perform Riemann integration.

Learning Outcomes:
On completion of the course, the student will be able to

- Determine the Riemann integrability and the Riemann-Stieltjes integrability of a bounded function and prove a selection of theorems concerning integration
- Recognize the difference between point wise and uniform convergence of a sequence of functions,
- Illustrate the effect of uniform convergence on the limit function with respect to continuity, differentiability, and integrability
- Illustrate the convergence properties of power series.

UNIT-I CONNECTEDNESS, COMPLETENESS **15 Hrs**

More about Open sets, Connected Sets – Bounded Sets and Totally Bounded Sets – Complete Metric Spaces.

Chapter 4 : Sec 6.1 to 6.4

UNIT-II COMPACTNESS **15 Hrs**

Compact Metric Space – Continuous Functions on Compact Metric Spaces – Continuity of Inverse Functions – Uniform Continuity.

Chapter 6: Sec 6.5 to 6.8

UNIT-III RIEMANN INTEGRATION **16 Hrs**

Definition of the Riemann Integral – Existence of Riemann integral(Statement only)- Properties of the Riemann Integral – Derivatives – Rolle's Theorem – The Law of the Mean – Fundamental Theorem of Calculus.

Chapter 7: Sec 7.2 to 7.8

UNIT-IV IMPROPER RIEMANN INTEGRATION **16 Hrs**

Improper integrals – Cauchy's Principle Value -Taylor's Theorem: Taylor's formula with Different Forms of Remainder – The Binomial Theorem – L'Hospitals Rule.

Chapter 7 : Sec 7.9 & 7.10 **Chapter 8 :** Sec 8.5 to 8.7

UNIT-V SEQUENCES AND SERIES OF FUNCTIONS **16 Hrs**

Pointwise Convergence of Sequence of Functions – Uniform Convergence of Sequence of Functions – Consequence of Uniform Convergence – Convergence and Uniform Convergence of Series of Functions.

Chapter 9 : Sec 9.1 to 9.4

Text Book

- Richard Goldberg.(2009). *Methods of Real Analysis.*Oxford & IBH Publishing Co. New Delhi.

Reference Books

- Tom Apostol, M.(2004). *Mathematical Analysis.* Addison-Wesley publishing Company Inc.(2nd ed.,). New York.
- Malik, S.C. and SavitaArora. (2010). *Mathematical Analysis*.Wiley Eastern Limited. New Delhi.
- Sanjay Arora and BansiLal.(2000). *Introduction to Real Analysis*. Sathya Prakashan. New Delhi.

E- Resources

- https://nptel.ac.in/syllabus/111106053/

COMPLEX ANALYSIS

UMAM602

Semester : VI **Credit : 6**
Category : Core XIV **Hours/Week: 6**
Class & Major: III B.Sc Mathematics **Total Hours :65**

Objectives:

To enable the students

- Understand imaginary value and concept winding around imaginary numbers.
- Apply the methods to solve problems in pure as well as in applied mathematics.

Learning Outcomes:

On completion of the course, the student will be able to

- Define the concepts of derivation of analytic functions.
- Define the concept of sequences and series of the complex functions.
- Express concepts of convergence sequences and series of the complex functions.
- Express concepts of Residue theorem.

UNIT-I FUNCTIONS **13 Hrs**

Function of a complex Variable – Mappings – Limits - Theorems on Limits - Limits involving the Point at Infinity - Continuity – Derivatives - Differentiation Formulas – Cauchy-Riemann Equations – Sufficient Conditions for Differentiability – Polar Coordinates – Analytic Functions - Harmonic Functions.

Chapter 2: Sec:9-20, 22

UNIT-II LINEAR TRANSFORMATIONS **13 Hrs**

Linear Transformations – The Transformation w=1/z – Linear Fractional Transformations – An Implicit Form - Mappings of the upper Half Plane – Exponential and Logarithmic Transformations – The Transformation w=sinz – Preservation of Angles – Further Properties.

Chapter 8: Sec 68-74

Chapter 9: Sec 79, 80

UNIT-III CONTOURS **12 Hrs**

Contours – Contours Integrals – Examples - Cauchy–Goursat's Theorem (without proof) - Simply and Multiply connected Domains (Theorems without proof) – Cauchy's Integral Formula – Derivatives of Analytic Functions – Maximum Moduli of Functions.

Chapter 4: Sec 31-33,36,38-40,42

UNIT- IV RESIDUES & POLES **14 Hrs**

Taylors Series – Examples - Laurents Series – Examples – Residues – Residue theorems – The Three Types of Isolate Singular Points – Residues at Poles – Zeros and poles of Order m.

Chapter 5: Sec 44-47 **Chapter 6:** Sec 53-56

UNIT-V IMPROPER INTEGRALS **13 Hrs**

Evaluation of Improper Integrals – Improper Integrals Involving Sines and Cosines – Steady Temperatures – Steady Temperatures in a Half Plane – A Related Problem – Temperatures in a Quadrant – Electrostatic Potential – potential in a Cylindrical Shape.

Chapter 7: Sec 60,61 154

Chapter 8: Sec 84-89

Text Book

- Churchill, R.V. and Brown, J.W. (1984). *Complex Variables and Applications.* Mc Gra Hill International Book Co., Singapore.
  Sections 8 to 20, 29 to 39, 41, 43 to 46, 54 to 60, 63 to 68, 70, 74.

Reference Books:

- Durai pandian, P. and Laxmi Duraipandian.(1976). *Complex analysis.* Emerald Publishers. Chennai.
- Ponnusamy, S.(2000). *Foundations of Complex Analysis.* Narosa Publishing House. New Delhi.

OPERATIONS RESEARCH

UMAM613

Semester : VI **Credits : 6**
Category : Core XVI **Hours/Week : 6**
Class & Major: III B.Sc Mathematics **Total Hours : 65**

Objectives:
To enable the students

- Gain the knowledge of optimization techniques
- Analyze the systems of queuing and networking
- Solve real life problems in Business and Management.

Learning Outcomes:
On completion of the course, the student will be able to

- Formulate and solve problems as networks and graphs.
- Develop linear programming (LP) models for shortest path, maximum flow, minimal spanning tree, critical path, minimum cost flow, and transshipment problems.
- Construct linear integer programming models and discuss the solution techniques.
- Propose the best strategy using decision making methods under uncertainty and game theory.

UNIT-I LINEAR PROGRAMMING PROBLEM **15 Hrs**

Linear Programming problem - Mathematical formulation of the problem - Graphical solution method – Some exceptional cases- Simplex method problem- Simplex Algorithm. Artificial Variable techniques - Big - M method, two phase method.

Chapter 2 : Section 2.1-2.4
Chapter 3: Section 3.1- 3.4
Chapter 4: Section 4.1, 4.3, 4.4

UNIT-II TRANSPORTATION AND ASSIGNMENT PROBLEMS **13 Hrs**

Transportation problem - The Transportation Algorithm - Degeneracy in Transportation problem-Unbalanced Transportation problem.The Assignment problem - The Assignment algorithm, Simple problems.

Chapter 10: Section 10.1-10.3, 10.5, 10.6, 10.8-10.10, 10.12-10.13
Chapter 11: Section 11.1 -11.4

UNIT-III SEQUENCING PROBLEM AND GAME THEORY **13 Hrs**

Sequencing problem - n jobs through 2 machines, n jobs through k machines - Two jobs through k machines, Simple problems. Game Theory - Two persons Zero sum game - The maximinminimax principle - Saddle points - Games without saddle points - Mixed Strategies - Graphical solution of 2 x n and m x 2 games - Dominance property.

Chapter 12: Section 12.1-12.6
Chapter 17: Section 17.1-17.7

UNIT-IV QUEUING THEORY **14 Hrs**

Queuing Theory- Queuing system- Elements of Queuing system-Operating Characteristic of a queuing system- Deterministic Queuing system-Probability distributions in Queuing systems-Classification of queuing models- Definition of Transient and steady state-Poisson Queuing systems (upto Model –VI)

Chapter 21: section 21.1-21.9

UNIT-V PERT AND CPM **10 Hrs**

Introduction-Basic components-Logical Sequencing Rules of Network construction-Concurrent Activities-Critical Path analysis –Probability consideration in PERT.

Chapter 25: Section25.1-25.7

Text Book

- Kanti Swaroop, Gupta,P.K. and Manmohan. (2010). *Problems in Operation Research*. Sultan Chand & Sons. Delhi.

Reference Books

- Sharma,J.K. (2001). *Operations Research Theory and Applications*. Macmillan.Delhi.
- Ravindran, A. Philips, D.T. and Solberg, J.J. (1987). *Operation Research*. John Wiley & Sons. New York.
- Taha, H.A. (2003).*Operations Research*. Macmillan publishing Company. New York.

MATHEMATICS FOR CONSTRUCTION

UMAO606

Semester : VI **Credits : 4**
Category : Major Optional **Hours/Week: 5**
Class &Major: III B.Sc Mathematics **Total Hours :65**

Objectives:

To enable the students

- Understand Concept of transposition and evaluation of formulae of construction
- Apply principles of area and volume for calculating concrete mix, flooring, painting
- Design setting-outs for a simple building site

Learning Outcomes:

On completion of the course, the student will be able to

- Produce creative works that demonstrate innovation in concepts.
- Describe, analyze and interpret the problem.
- Create original objects of art in a specific medium.
- Select appropriate media relative to concepts and forms of art.

UNIT - I CONVERSION AND EVALUATION OF FORMULAE **12 Hrs**

Introduction - Length – Conversion factors – Use of the graphical method – Mass-Area volume and capacity – Temperature – Transpositions of formulae – Evaluation of formulae.

Chapter 9: Section 9.1-9.5.

Chapter 6: Section 6.1-6.2.

UNIT - II AREAS AND VOLUMES OF STRUCTURES 14 Hrs

Introduction – Area of triangles-Area of quadrilaterals – Area of circles – Application of area to practical problems- Cavity walls- Volumes introduction- Volume of Prism, Cylinders, Pyramids and Cones- Mass, Volume and Density- concrete mix and its constituents.

Chapter 11: Section 11.1-11.5.

Chapter 12: Section 12.1-12.4.

UNIT – III SPECIAL STRUCTURES AND MATERIALS 15 Hrs

Introduction - Surface area of a pyramid - Frustum of a pyramid - Surface area of a cone - Frustum of a cone- Costing materials Introduction - Foundations - Cavity walls - Flooring – Painting.

Chapter 17: Section 17.1-17.3.

Chapter 15: Section 15.1-15.5

UNIT - IV ELEVATION AND DEPRESSION 12 Hrs

Introduction - The Trigonometrical ratios - Trigonometric ratios for 30°, 45°, 60° - Angles of elevation and Depression - Stairs - Roofs - Excavations and Embankments.

Chapter 13: Section 13.1-13.7.

UNIT - V SETTING OUT 12 Hrs

Introduction - Setting out a simple building site - Bay windows and curved brickwork - Checking a building for square corners - Circular arches - Elliptical arches.

Chapter 14: Section 14.1-14.6.

Text Book

- Surinder Singh Virdi, and Roy Baker,T. (2007).*Construction Mathematics*. Elsevier Publications.

Reference Books

- Lal, D. (2012). *Construction Managements and PWD accounts.* Kataria and sons publishers.(2nd ed.,). New Delhi.
- Alfred Webster, and Kathryn bright. (2010). *Mathematics for the carpentering and the construction trade*. Pearson education trust. (2nd ed.,).

MATHEMATICS IN SPACE SCIENCE

UMAO607

Semester : VI **Credit : 4**
Category : Major Elective **Hours/Week : 5**
Class &Major: III B.Sc Mathematics **Total Hours : 65**

Objectives:
To enable the students

- The process of star and planet formation.
- Introduce the exciting world of astronomy to the students.
- Familiarize the students with the moon and stellar Universe.

Learning Outcomes:
On completion of the course, the student will be able to

- Demonstrate an understanding of our present picture of the cosmos on a large scale.
- Detail the main features and formation theories of the various types of observed Galaxies, in particular the Milky Way.
- Demonstrate an understanding of our present picture of the cosmos on a large scale.
- Demonstrate observations of the universe and to understand some phenomenon of our world.

UNIT-I CELESTIAL SPHERE **13 Hrs**

Celestial sphere – Diurnal motion. Chap 2.

UNIT-II ZONES OF EARTH **13 Hrs**

Zones of Earth – Dip of the Horizon – Twilight – Astronomical refraction – Tangent and Cassinies formulae – Properties and simple problems. Chap 3

UNIT-III KEPLER`S LAW **13 Hrs**

Kepler's law (statement only) – Newton's deduction from them – Three Anamalies of the earth and relations between them – Times – Equation of time, Season. Chap 6, 7

UNIT-IVABERRATIONS **13 Hrs**

Conversion of time – Years and Calendar – Heliocentric Parallax – Geometric Parallax – Annual Parallax – Aberration of light – Simple problems in the above. Chap 7.

UNIT-VECLIPSES **13 Hrs**

Moon (omitting moon liberations), Phases of moon- Harvest moon – Metonic cycle - Lunar mountain - Earth shine - Tides – Eclipses**.** Chap 12

Text Book:

- Kumaravelu,S. and SusheelaKumarvelu. (2005). *Astronomy for Degree Classes*. Rainbow Printers. Nagarcoil.

Reference Books:

- Kartunen,H. (2013). *Fundamental Astronomy.* Content Technologies Publications.
- Prophet Mohammed, (2013). *Astronomy Supplementary Guide.* Core Knowledge Foundation.

E-Resources:

- http://www.astronomy.com/
- http://www.theastronomer.org/

III & IV EVALUATION COMPONENTS OF CIA

Semester	Category	Course Code	Course Title	Component – III	Component - IV
V	III	UMAM507	Modern Algebra	Seminar	Assignment
V	III	UMAM512	Real Analysis I	Assignment	Seminar
V	III	UMAM506	Number Theory	Assignment	Seminar
V	III	UMAM510	Numerical Methods	Problem solving	Seminar
VI	III	UMAM614	Linear Algebra	Problem solving	Seminar
VI	III	UMAM615	Real Analysis II	Assignment	Seminar
VI	III	UMAM602	Complex Analysis	Assignment	Seminar
VI	III	UMAM613	Operations Research	Problem solving	Poster Presentation
VI	III	UMAO606	Mathematics for construction craft	Problem solving	Poster Presentation
VI	III	UMAO607	Mathematics in Space Science	Assignment	Poster Presentation

PROGRAMME PROFILE M.Phil Mathematics

Semester	Category	Course Code	Course Title	Contact Hrs/week	Credit
I	CORE	MMAM103	Algebra and Analysis	6	5
	CORE	MMAM102	Topology and Differential Geometry	6	5
	CORE	MMAM105	Special Area Study	6	5
	ELECTIVE	MRPE101	Research and Publication Ethics	2	2
II	CORE	MMAD201	Dissertation & Viva-Voce	30	13
TOTAL					**30**
Paper Presentation (Minimum one) and/ or Publication of articles in Journals (Minimum one) is mandatory for submission of Dissertation					

DEPARTMENT OF PHYSICS

PREAMBLE

UG : Programme Profile and Syllabi of Courses offered in the V and VI Semesters along with Evaluation Components III & IV (With Effect from 2018-2021batch 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	Language	UTAL105/UTAL106/ UHIL101/UFRL101	Basic Tamil-I/Advanced Tamil I/Hindi/French	UTAL103/ UTAL104	4	2/3
	II	English	UENL107/UENL108	General English-I/Advanced English-I	-/UENL106	5	3/4
	III	Core I	UPHM103	Mechanics	-	5	5
	III	Core II	UPHM105	Properties of Matter	-	6	5
	III	Core Practical-I	UPHR102/UPHR202	Major Practical I		3	2
	III	Allied	UMAA114	Allied Mathematics I	UMAA104	5	5
	IV	Value Education				2	1
					TOTAL	**30**	**23/25**
II	I	Language	UTAL205/UTAL206 UHIL201/UFRL201	Basic Tamil-II/Advanced Tamil-II/Hindi/French	UTAL203/ UTAL204	4	2/3
	II	English	UENL207/UENL208	General English-II/Advanced English-II	-/UENL206	5	3/4
	III	Core III	UPHM203	Thermal and Statistical Physics	UPHM104	7	6
	III	Core Practical-II	UPHR203/UPHR101	Major Practical II	-	3	2
	III	Allied	UMAA222	Allied Mathematics II	UMAA212	5	5
	IV	NME	-	-	-	4	2
	IV	Soft Skill				2	1
	V	Extension Programme/ Physical Education/NCC	-	-		-	1/2
					TOTAL	**30**	**22/25**
III	I	Language	UTAL305/ UTAL306/ UHIL301/ UFRL301	Basic Tamil-III/Advanced Tamil-III/Hindi/ French	UTAL303/ UTAL304	4	2/3
	II	English	UENL307/UENL308	General English-III/ Advanced English-III	-/UENL306	5	3/4

	III	Core IV	UPHM303	Electricity and Magnetism	UPHM402	6	5
		Core V	UPHM304	Mathematical Physics	UPHM509	4	3
	III	Core Practical-III	UPHR303	Major Practical III	-	3	2
	III	Allied	UCSA306	Computational Physics with Python	-	3	3
	III	Allied Practical	UCSR310	Computational Physics with Python Lab	-	3	2
	IV	Value Education	-	-		2	1
					TOTAL	**30**	**21/23**
IV	I	Language	UTAL405/ UTAL406/ UHIL401/ UFRL401	Basic Tamil-IV/Advanced Tamil-IV/Hindi/ French	UTAL403/ UTAL404	4	2/3
	II	English	UENL407/ UENL408	General English-IV/ Advanced English-IV	- /UENL406	5	3/4
	III	Core VI	UPHM406	Optics and Laser Physics	UPHM302	4	4
	III	Core VII	UPHM407	Atomic Physics	-	4	4
	III	Core Practical-IV	UPHR405	Major Practical IV	-	3	3
	III	Allied	UCHA401/ UCHA402/ UCHA403	Chemistry for Physics	-	3	3
	III	Allied Practical	UCHA402/ UCHR403	Volumetric and Organic Analysis-I	-	3	2
	III	Core XI	UPHP501/ UPHP511	Project / Instrumentation Techniques	-	2	-
	IV	Soft Skill				2	1
	V	Extension Program -me/ Physical Education/NCC				-	-/2
					TOTAL	**30**	**22/26**
V	III	Core VIII	UPHM501	Quantum Mechanics and Relativity	-	6	5
	III	Core IX	UPHM505	Basic Electronics	-	6	5
	III	Core X	UPHM506	Solid State Physics	UPHM608	6	5
	III	Core Practical-V	UPHR502	Major Practical V	-	3	3
	III	Core XI	UPHP501/ UPHP511	Project / Instrumentation Techniques	-	4	4/5
	III	Online Course		NPTEL/Spoken Tutorial		3	1
	IV	Value Education				2	1
				TOTAL		**30**	**24/26**
VI	III	Core XII	UPHM609	Numerical methods and Basic Computational Physics	-	5	5
	III	Core XIII	UPHM611	Nuclear and Radiation Physics	-	5	5
	III	Core XIV	UPHM612	Material Science	-	5	5
	III	Core XV	UPHM613	Digital Electronics	-	5	4
	III	Core Practical VI	UPHR605	Major Practical VI	-	3	3
	III	Major Elective	UPHO601/ UPHO602/ UPHO603	Nanophysics/ Astrophysics/ Functional Materials	-	5	4
	III	Viva Voce	UPHM610	Comprehensive Viva Voce	-	-	1
	IV	Soft Skill				2	1
	V	Extension Program -me/Physical Education/NCC				-	-/2
				TOTAL		**30**	**28/30**
					GRAND TOTAL	**180**	**140/155**

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	UPHE202	Applied Physics	-	4	2
			UPHE203	Biomedical Instrumentation	-	4	2
			UPHE204	Electrical Appliances	-	4	2
			UPHE205	Telecommunication System	UPHE304 /UPHE503	4	2
			UPHE206	Servicing and maintenance of home appliances	UPHE303	4	2

ALLIED

Semester	Part	Category	Course Code	Course Title	Previous Course Code	Contact Hrs/week	Credit Min/ Max
I	III	Allied	UPHA102	Allied Physics-I	UPHA101	3	3
I	III	Allied	UPHR103	Physics for Chemistry Practical – I	UPHR102	3	2
II	III	Allied	UPHA203	Allied Physics-II	UPHA202	3	3
II	III	Allied	UPHR202	Physics for Chemistry Practical – II	-	3	2
III	III	Allied	UPHA303	Digital Electronics	-	3	3
III	III	Allied	UPHR303	Digital Electronics Practical	-	3	2
IV	III	Allied	UPHA402	Electronics(For Mathematics major)	-	3	3
IV	III	Allied	UPHR402	Electronics Practical (For Mathematics major)	-	2	2

Inclusion of Experiential Learning

A. Experiential Learning (Mandatory)

Course Mapping				Collaborating Agency - MSME		
Semester	Course Code	Course Title	Assessment	Course Title	Hours / 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	Hours / Days/ Month	Mode of Evaluation	Credits (Min/Max)
V	Core	UPHT501	PCB Design	MSME	4 days	Reflection	1

QUANTUM MECHANICS AND RELATIVITY

UPHM501

Semester : V **Credit : 5**
Category : Core XI **Hours/Week: 6**
Class & Major: III B.Sc Physics **Total Hours: 78**

Objectives:
To enable the students

- Understand the basic concepts of Quantum Mechanics and Fundamental Postulates of Relativity.
- Expose the Students to the Applications of Quantum Mechanics and Relativity.

UNIT- I FOUNDATIONS OF WAVE MECHANICS 15 Hrs

Introduction–Inadequacy of Classical Mechanics – Dual Nature of Light and Matter – de Broglie wavelength–Compton Effect -Experiments of Davisson–Germer and G.P. Thomson–The Electron Microscope –Heisenberg Uncertainty Principle –Applications of Uncertainty Principle.

UNIT -II SCHRODINGER EQUATION 15 Hrs

Schrodinger Equation – Physical Interpretation of Wave function– Probability Current Density –Ehrenfest Theorem–Eigenfunction and Eigenvalue –Eigenvalue Equation – Orthogonal Eigenfunctions– Reality of Energy Equivalence.

UNIT- IIIAPPLICATIONS OF SCHRODINGER EQUATION 16 Hrs

Free Particle –Particle in a Bound State – Eigenfunctions and Eigen values of a Particle in a Rectangular Potential – Reflection and Transmission Coefficient Rectangular Potential – Particle in 1-DWell of Finite Depth –Bound States –One Dimensional Linear Harmonic Oscillator.

UNIY-IV SPECIAL THEORY OF RELATIVITY 16 Hrs

Frames of References –Inertial Frames and Non inertial frames–Galilean Transformation – Michelson-Morley Experiment –Interpretation of the Results –Postulates of Special Theory of Relativity –Lorentz Transformation Equations –Length Contraction –Time Dilation – Transformation of Velocities –Redefining Momentum –Variation of Mass with Velocity – Mass– Energy Equivalence.

UNIT-V APPLICATIONS OF QUANTUM MECHANICS 16 Hrs

Teleportation– Instantaneous Communication –Quantum Computers –Quantum Tunneling –Quantum Sensing and Imaging –Quantum Metrology –The Transistor –Energy Harvesters –Ultra Precise Thermometer – Lasers–Random less Generator–Quantum Cryptography –Ultra Price Clocks.

Text Books

- Mathews, P.M. and Venkatesan, K. (2005). *A Text Book of Quantum Mechanics*. Tata McGraw-Hill. New Delhi.
- Murugesan, R. (2008). *Modern Physics*. S. Chand & Company Ltd. New Delhi.

Reference Books

- Ghatak and Loganathan. (2004).*Introduction to Quantum Mechanics*. Macmillan India Ltd. India.
- Arthur Beiser. (2006). *Concepts of Modern Physics.* McGraw Hill. New Delhi.
- Narlikar. (2004). *Lectures on General Theory of Relativity.* Macmillan India Ltd. India.

BASIC ELECTRONICS

UPHM505

Semester : V **Credit : 5**
Category : Core XII **Hours/Week : 6**
Class & Major: III B.Sc Physics **Total Hours : 78**

Objectives:
To enable the students

- Introduce the various Principles of Analog Electronics and its Applications to various Electronic Instruments.
- Provide a Theoretical Basis for the Electronics Experiments and the Students will do in their Practical Sessions.

UNIT-I SEMICONDUCTOR DEVICES 16 Hrs

Classification of Solids in terms of Forbidden Energy Gap – Effect of Temperature on Fermi Level – Semiconductor Diode – Characteristics–Zener Diode– Working and Output Characteristics–Voltage Stabilization using Zener Diode– Transistor Construction and Working – Types of Biasing – Characteristics in CE,CB,CC mode.

UNIT-II RECTIFIERS AND MULTIVIBRATORS 16 Hrs

Half–Wave and Full–Wave Bridge Rectifiers–Output and Efficiency of Full Wave Rectifier – Expressions for Efficiency and Ripple Factor – Application: Regulated Power Supply using Zener Diode–Multivibrators – Types of Multivibrators– Astable, Monostable, Bistable Multivibrator – Circuit Details and Operations.

UNIT-III CIRCUIT ANALYSIS AND OSCILLATORS 16 Hrs

Network Analysis – Thevenin's, Norton's and Maximum Power Transfer Theorems Wave– Shaping Circuits: Differentiating Circuit – Output Waveforms – Integrating Circuit – Output Waveforms – Clipping and Clamping Circuits – Types and Applications – Fundamental Principles of Oscillators – Concept of Positive Feedback – Types of Oscillators – Hartley, Colpitts, Phase Shift and Wien Bridge Oscillators –Their Analysis.

UNIT-IV AMPLIFIERS AND POWER ELECTRONICS 15 Hrs

Voltage and Power Amplifiers– Classification of Amplifiers– RC Coupled Amplifier – Frequency Response Curve – Power Amplifier – Characteristics – Emitter Follower– FET,MOSFET,UJT and SCR – Construction and Working – Output Characteristics – Parameters of FET – SCR as Half and Full Wave Rectifiers.

UNIT-V OPERATIONAL AMPLIFIERS 15 Hrs

Introduction – Characteristics of an Ideal OP–AMP – CMRR – Slew Rate – Inverting/ Non inverting Amplifiers - Adder and Difference Amplifiers– Differential Amplifier – Integrator, Voltage Follower, Comparator.

Text Books

- Metha, V.K. (2001). *Principle of Electronics*. S. Chand & Company Ltd. New Delhi.
- Sedha, R.S. (2005). *A Text Book of Applied Electronics.* S. Chand & Company Ltd. New Delhi.

Reference Books

- Theraja, B.L. (2005).*Basic Electronics*. S. Chand & Company Ltd. New Delhi.
- Gaykwad, A. (1995). *Operational Amplifiers and Linear Integrated Circuits*. Printice Hall of India Pvt. Ltd. India.
- Millman, J. and Halkias, C. C. (1991).*Integrated Electronics*. Tata McGraw – Hill. New Delhi.

SOLID STATE PHYSICS

UPHM506

Semester : V **Credit : 5**
Category : Core X **Hours/Week: 6**
Class & Major: III B.Sc Physics **Total Hours: 78**

Objectives:

To enable the students

- Understand the basic concepts of Crystal Structure and Materials Science.
- Analyze the Mechanical Properties of Metals and Electron Theory of Metals.
- Acquire the knowledge about X – Rays and XRD Techniques.

UNIT-I CRYSTAL STRUCTURE 16 Hrs

Classification of Solids – Unit Cell – Crystal Lattice and Basis– Seven Classes of Crystals – Bravais Lattice– Miller Indices – Symmetry Operations – Point Groups and Space Groups – Types of Lattice (Plane Lattice with BCC and FCC) –Structure of Crystals: Simple Cubic, HCP, FCC and BCC– Examples: NaCl, Diamond and ZnS Structures– Crystal Imperfections – Types of Imperfections.

UNIT-II ELECTRON THEORY OF METALS 16 Hrs

Classical Free Electron Theory – Drawbacks of Classical Theory– Quantum Theory of Free Electron– Somerfield's Model for Free Electron (1D Solids, generalization for 3D Solids) – Electron Energies in a Metal – Band Theory of Solids –Energy Gaps – Density of States – Bands in Conductors, Insulators and Semiconductors – Factors Affecting Electrical Resistance of Materials.

UNIT-III (a) CLASSIFICATION OF MATERIALS **15 Hrs**

Advanced Materials and Modern Material Structure – Types of Bonds and their Energies – Bond Formation Mechanism – Ionic and Covalent Bonds– Ceramics – Thermal and Electric Properties – Uses.

(b) MECHANICAL PROPERTIES OF METALS

Elastic Deformation – Plastic Deformation – Interpretation of Tensile Stress–Strain Curves –Yield Criteria and Macroscopic Aspects of Plastic Deformation – Property Variability and Design Factor.

UNIT-IV (a) X-RAYS AND XRD **15 Hrs**

X–Rays – Absorption of X–Rays – X-Ray Spectra – Diffraction of X–Rays by Crystals – Bragg's Law– Laue Method – Rotating Crystal Method – Powder Photographic Method.

(b) NON DESTRUCTIVE TESTING

Radiographic Method – Ultrasonic Method–Equipment's used for NDT –Electron Microscope – Scanning Electron Microscope (SEM).

UNIT-V MAGNETIC MATERIALS AND DIELECTRICS **15 Hrs**

Types of Magnetic Materials – Magnetic Permeability, Magnetization, Susceptibility, Electric Current in Atoms – Bohr Magneton– Electron Spin – Magnetic Moment due to Nuclear Spin – Quantum Theory of Paramagnetism– Quantum Theory of Ferromagnetism, I-H Curve– Magnetic Moments due to Electron Spin – Ferromagnetism the Domain Structure – Soft and Hard Magnetic Materials– Polarization Electronic, Ionic, Orientation and Space Charge Polarization – Temperature and Frequency Effects – Electric Breakdown – Ferroelectric Materials.

Text Books

- Gupta, R.B. (2001). *Material Science for AMIE*. Umesh Publications.
- Pillai, S.O. (2005). *Solid State Physics*. Wiley Eastern Ltd.

Reference Books

- Kittel, C. (1996). *Introduction to Solid State Physics,* Wiley Eastern, (7^{th}ed.,).
- Narula, G.K. Narula, K.S. Gupta, V.K. (1989). *Materials Science*, Tata McGraw Hill. New Delhi.
- Raghavan, V. (1990). *Materials Science and Engineering a First Course.* Prentice Hall of India. India.

PROJECT

UPHP501

Semester : V **Credit : 4**
Category : Core XI **Hours/Weeks : 2 + 4**
Class &Major: III B.Sc Physics **Total Hour : 78**

Guidelines

- This course is offered as group project
- No. of students is limited from 5 to 6

PROJECT EVALUATION

S.No.	Criteria		Evaluation	
			CIA (Valuation by Faculty Guide)	**ESE (Average of Internal &External marks)**
1	Choice of the Problem & Defining the Problem		10	-
2	Review of Literature		10	-
3	Research Proposal		10	-
4	Collection of Data / Experimentation		10	-
5	Analysis of Data / Experimentation Result		10	-
6	Preparation of Report	I Draft II Draft III Draft Final Draft	10	-
7	Project Report		-	30
8	Viva Voce		-	10
Total			**60**	**40**

INSTRUMENTATION TECHNIQUES

UPHM511

Semester : V **Credit : 4**
Category : Core XI **Hours/Weeks: 6**
Class &Major: III B.Sc Physics **Total Hours : 78**

Objectives:
To enable the students

- Understand the Concepts of Electromagnetic Radiation.
- Apply the Knowledge in Different Techniques.

UNIT- I ELECTROMAGNETIC RADIATION **16 Hrs**

Electromagnetic Radiation–Different Regions, their Wavelengths, Frequencies and Energies–Interaction of EM Radiations with Matter – Atomic, Molecular, Electronic Interaction–Basic Principles of Spectroscopy –Emission and Absorption of Radiations– Radiation Sources – Dispersing and Resolving Techniques – Detectors – typical Atomic Emission and Absorption Spectrographs in the UV and Visible Region.

UNIT- II MOLECULAR SPECTRA **14 Hrs**

IR Absorption – Spectroscopy –RAMAN Spectroscopy – Instrumentation Techniques for Analyzing Solid, Liquid and Gaseous samples – Sample handling Techniques.

UNIT- III DIFFRACTION TECHNIQUES **16 Hrs**

Microstructure Characterization Diffraction Techniques: Interpretation of Single Crystal and Powder Crystal X-RAY Diffraction Patterns, Identification &Quantitative Estimation of unknown samples by X-ray Powder Diffraction Technique and Fluorescent Analysis – Theory and Method of Particle Size Analysis.

UNIT-IV ELECTRON MICROSCOPY TECHNIQUES AND ELCTRONIC INSTRUMENTS **16 Hrs**

Electron Microscopy techniques related to Nanomaterials SEM, TEM& AFM (Instrumentation and Working only).

Digital Voltmeters and Multimeters–Electronic Counters–AC Milli voltmeter–Wave Analyzers and Spectrum Analyzers–Frequency Synthesizers –Lock in Amplifier–Frequency Response Analyzer Phase Meter.

UNIT- V ELECTRONIC RECORDERS AND DISPLAYS **16 Hrs**

Standard Lab Equipments–Signal Generator–Pulse Generator–CRO–VTVM–Wave Analysis Recorders–Analog Recorders–XY – Recorders–Stripe Chart Recorder–Oscilloscope Recorder–Digital Recorder– Digital Readout CRO.

Text Books

- Aruldas, G. (2007). *Molecular Structure and Spectroscopy*. Print Book. English. (2nd ed.,). New Delhi.
- Sawnney, A.K.(2005). *A Course in Electrical &Electronic Measurements &Instrumentation.* Dhanpat Rai & Company Ltd.

Reference Books

- Skoog, D.A. West, D.M. (2000).*Principles of Instrumental Analysis*.(2nd ed.,). Holt-Saunders.
- Cottrell, Sir A. (2000). *An Introduction to Metallurgy*. University Press.
- Brophy, J.H. Rose, R.M. Wulff, J. (2007).*The Structure & Properties of Materials*(Volume II). Wiley Eastern Ltd.

MAJOR PRACTICAL V

UPHR502

Semester	**: V**	**Credit**	**: 3**
Category	**: Core Practical-V**	**Hours/Week**	**: 3**
Class & Major:	**III B.Sc Physics**	**Total Hours**	**: 39**

Objectives:

To enable the students

- Understand the Theoretical Concepts of Electronics by doing actual Experiments
- Design simple Electronics Circuits and make Measurements.
- Appreciate the Significance of Electronics in Practical Life.

1. V-I Characteristics of Zener Diode
2. Characteristics of Transistor in CE Configuration
3. Full Wave - Bridge Rectifier
4. Voltage Stabilization of using Zener Diode
5. Operational Amplifier as Adder, Subtractor, Inverting and Non-inverting Amplifier
6. Operational Amplifier as Integrator, Differentiator, and Voltage Follower
7. Differentiating, Integrating, Clipping and Clamping Circuits
8. RC Coupled Amplifier - Frequency Determination

Optional

1. Half Wave Bridge Rectifier
2. Junction Diode – Characteristics

Text Book

- Srinivasan, N. Balasubramanian, S and Ranganathan, R. (2006).*The Text Book of Practical Physics.* Sultan Chand & Sons.

Reference Books

- Ponnusamy, A. and Amalanathan, B. (2006).*Practical Physics*. Bright Publishers.
- Ouseph, C.C. Rangarajan, G. (1990).A *The Text Book of Practical Physics*. Viswanathan Publishers – Part I.

NUMERICAL METHODS AND BASIC COMPUTATIONAL PHYSICS

UPHR609

Semester : VI	**Credit : 5**
Category : Core XII	**Hours/Week : 5**
Class &Major: III B.Sc. Physics	**Total Hours : 65**

Objectives:

To enable the students

- Understand Different Numerical Methods and their Applications.
- Acquire the Knowledge about Basic Computing.
- Apply the Computational Techniques for Simple Physics Applications**.**

UNIT - I NUMERICAL SOLUTION OF LINEAR AND NONLINEAR EQUATIONS 12 Hrs

Newton –Raphson Method; Iterative Rule –Termination Criteria–Rate of Convergence – Drawbacks –Simultaneous Linear Algebraic Equations: Augmented Matrix – Gauss Elimination – Jordan's Modification– Inverse of a Matrix by Gauss– Jordan Method.

UNIT - II INTERPOLATION AND CURVE FITTING 12 Hrs

Interpolation: Newton's Interpolation – Linear Interpolation–Higher Order Polynomials – Divided Differences – Gregory–Newton Forward and Backward Interpolation Formulae – Error in Interpolation– Lagrange Interpolation.

Curve Fitting: Method Least– Squares–Normal Equations–Straight Line, Exponential Fits and Power – Law Fits.

UNIT - III NUMERICAL DIFFERENTIATION, INTEGRATION AND ODE 12 Hrs

First and Second-Order Derivatives: Central Difference Formulae **Numerical integration:** Trapezoidal, Simpson's 1/3 Rules–Truncation Error – Composite Trapezoidal, and Simpson's 1/3 Rules–**ODE:** Euler and Fourth–Order Runge – Kutta Methods for First Order ODE.

UNIT - IV PROGRAMMING IN C 14 Hrs

Programming Methodologies – Scientific Programming Languages– Programming in C– Variables– Expressions and Statement–Operators–Library Function–Data Input and Output –Structure of C Programming–Control Statements–Functions–Global Variables– Arrays– Character-Strings – Structures.

UNIT - V COMPUTATIONAL PHYSICS 15 Hrs

Developing Algorithm and C– Programming for: Motion of a Projectile Including Air Drag (Feynmen– Newton Method) –Electric Field due to a Point Charge and N Charges – Comparison between Analytical and Numerical Techniques: Curve Fitting; Principle of Least Squares and Fittinga Straight Line.

Text Books

- Harder,D.W. Khoury, R. (2010). *Numerical Analysis.* University of Waterloo.
- Burden, A.M. Burden, R.L. Faires, J.D. (2016).*Numerical Analysis.*(10^{th}ed.,).
- Balagurusamy, E. (2008).*ANSI C*.

Reference Books

- Sastry, S.S. (2003).*Introductory Methods of Numerical Analysis*. PHI, New Delhi.
- Sankara Rao, K. (2012).*Numerical Methods for Scientist and Engineers*.(3^{rd} ed.,) PHI Learning Private Limited.

NUCLEAR AND RADIATION PHYSICS

UPHM611

Semester : VI **Credit : 5**
Category : Core XII **Hours/Week: 5**
Class & Major: III B.Sc Physics **Total Hours: 65**

Objectives:
To enable the students

- Understand the Nucleus and its Various Models.
- Acquire Knowledge of the Basic Idea of Elementary Particles and Understand the Principles of Particle Accelerators and Nuclear Fission and Fusion.
- Realize the Applications of Radiations in Medical Diagnosis and Radiation Therapy.

Learning Outcomes
On completion of the course, the students will be able to

- Learned about the basics of nuclear size, properties, various nuclear models, principle and working of detectors, elementary particles, fission and fusion processes and its application.
- Recognized about the radiation therapy and safety precautions related advisory services.

UNIT –I NUCLEAR STRUCTURE **14 Hrs**

General Properties of Nucleus – Size, Mass and Charge–Proton – Electron Theory – Proton – Neutron Theory – Nuclear Size –Experimental Measurement of Nuclear Radius – Mirror Nuclei Method –Meson Theory of Nuclear Forces – Basic Ideas of Nuclear Models – Liquid Drop Model –Weizacker's Semi– Empirical Formula – Nuclear Shell Model.

UNIT –II NUCLEAR DETECTORS AND ELEMENTARY PARTICLES **14 Hrs**

Principle and Working – Solid State Detector – Proportional Counter –Wilson's Cloud Chamber – Scintillation Counter – Accelerators: Synchrocyclotron – Synchrotron – Electron Synchrotron –Proton Synchrotron –Betatron.

Elementary Particles – Types of Interactions – Classification of Elementary Particles – Particle Quantum Numbers – Baryon Number –Lepton Number – Strangeness Number – Hyper Charge –Isospin Quantum Number–Conservation of Laws.

UNIT – III NUCLEAR FISSION AND FUSION 13 Hrs

Rutherford's Experiment – Bohr's Theory of Nuclear Disintegration – Q value Equation for a Nuclear Reaction – Threshold Energy – Types of Nuclear Reaction – Energy Balance and the Q value – Threshold Energy of an Endoergic Reaction– Nuclear Fission – Bohr Wheeler Theory – Chain Reaction – Critical Size and Critical Mass – Nuclear Fission Reactor – Nuclear Fusion – Source of Stellar Energy – Carbon – Nitrogen Cycle – Proton – Proton Cycle –Thermo Nuclear Reaction – Basic Ideas of Plasma.

UNIT-IVELECTROMAGNETIC RADIATIONS 12 Hrs

Electromagnetic Spectrum–Classification – Ionizing Radiation and Nonionizing Radiation–Source of Radiation–Radio Frequency, Microwaves, Infrared, Visible, Ultraviolet andX–Ray, Gamma Ray Radiation (Qualitative)–Production –Physical Properties.

UNIT –VRADIATION INSTRUMENTATION AND RADIATION THERAPY 12 Hrs

Radiological Imaging–Digital Radiography–Computer Tomography Scanner– X – Ray Detection Method–Gamma Camera-Radiation Measurement by GM Counter.

Radiotherapy–Deep Therapy Machine–Basics of Teletherapy Units–Deep X – Ray, Telecobalt Units–Heavy Ion Therapy–Carbon Ion Therapy–Neutron Therapy.

Text Books

- Murugesha, R. and Kiruthiga, S. (2016).*Modern Physics*. S. Chand &Company Ltd. New Delhi.
- Thayalan, K. (2009).*Basic Radiological Physics.* Medical Publishing PVT, Ltd. New Delhi.

Reference Books

- Glasstone, S. (2014).*A Source Book on Atomic Energy*. Krieger Publishing Company; (3rdRevised ed.,).
- Little Field, T.A.and Thorley, N. (2013).*Atomic and Nuclear Physics*. Medtec, New Delhi.
- Srivatsava, B.N. (2011).*Basic Nuclear Physics and Cosmic Rays*. Pragti Prakashan Publishers. Meerut.
- Chandra, L. (2011).*Nuclear Medicine Physics*. Williams and Wilkins.

E-Resources

- https://www.worldscientific.com/worldscibooks/10.1142/8982
- https://www.amazon.in/Nuclear-Radiation-Physics-Ralph-Lapp/dp/013625988X
- http://www.ichtj.waw.pl/ichtj/publ/monogr/sun2017/sun-chapter1.pdf
- http://www.sfu.ca/~mxchen/phys1021003/P102LN34.pdf

MATERIALS SCIENCE

UPHM612

Semester : VI **Credit : 5**
Category : Core XIV **Hours/Week: 5**
Class &Major: III B.Sc Physics **Total Hours: 65**

Objectives:
To enable the students

- Understand about the Different Kinds of Materials.
- Gain Knowledge about the Applications of Modern Engineering Materials.

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

- Learned about the Various Kinds of Materials and its Applications.
- Realized about the Properties and Application of Modern Engineering Materials.

UNIT – ICHEMICAL BONDS **12 Hrs**

Review of Atomic Structure – Interatomic Potentials– Different Types of Chemical bonds – Ionic, Covalent Bond– Van der Waals bond –Metallic Bond –Hydrogen Bond– Binding Energy of a Crystal – Elastic Properties.

UNIT – IINANOMATERIALS **12 Hrs**

Introduction–Techniques for Synthesis of Nanophase Materials–Sol–Gel Synthesis– Electro deposition–Inert Gas Condensation–Mechanical Alloying–Properties of Nanophase Materials–Applications of Nanophase Materials, Composite Materials: Introduction-Types.

UNIT – III MAGNETIC AND DIELECTRICS MATERIALS **14 Hrs**

Introduction – Types of Magnetic Materials – Diamagnetism –Paramagnetism, Ferromagnetism – Ferrites: Preparation and their Applications – Magnetic Bubble Memory and Applications – Insulating Materials: Classification on the Basis of Temperature – Polymer Insulating Materials and Ceramic Insulating Materials – Ferro Electric Materials: Examples – Applications of Ferroelectries Materials.

UNIT – IV SUPERCONDUCTING MATERIALS **14 Hrs**

Introduction to Superconductivity–Persistent Currents– Effect of External Magnetic Field Critical Current Density–Meissner Effect– London Penetration Depth– BCS Theory Descriptive– Type of Superconductors– Josephson Effect (AC and DC)– Applications – Maglev–SQUIDS–High –Tc Superconductors.

UNIT – V ADVANCED MATERIALS **13 Hrs**

Metallic Glasses–Introduction-Composition, Properties and Applications– Shape Memory Alloys: Introduction–Examples–Application of SMA–Advantages and Disadvantages. Biomaterials: Introduction– Metals and Alloys in Biomaterials – Ceramic Biomaterials, Composite Biomaterials.

Text Books

- Frenking, G. Shaik, S. (2014). *The Chemical Bond: Fundamental Aspects of Chemical Bonding*. Wiley-VCH Verlag GmbH & Co. KGaA.
- Raghavan, V.R. (2001). *Material Science and Engineering*. Printice Hall India Ltd. India.
- Pradeep, T. (2007). *Nano: The Essentials in Understanding Nano science and Nanotechnology*. Tata McGraw Hill. New Delhi.

Reference Books

- Callister, W.D. (2014).*Materials Science and Engineering*. John Wiley & Sons, Inc.
- Bhattacharya, S. (2013).*A Text Book of Nano science and Nanotechnology*. Wisdom Press.

E-Resources

- http://www.issp.ac.ru/ebooks/books/open/Materials_Science_and_Technology.pdf
- https://www.pdfdrive.com/materials-science-and-engineering-an-introduction-e7853330.html
- https://www.pdfdrive.com/fundamentals-of-materials-science-and-engineering-e29579234.html

DIGITAL ELECTRONICS

UPHM613

Semester : VI	**Credit : 4**
Category : Core-XVI	**Hours/Week: 5**
Class & Major: III B.Sc Physics	**Total Hours: 65**

Objectives:

To enable the students

- Acquire Knowledge about the Basics of Digital Electronics and Microprocessor
- Develop a Simple Real Time Programs using Microprocessor 8085

UNIT-I FUNDAMENTALS IN LOGIC GATES 13 Hrs

Number System–Binary Number System–Decimal and Binary Conversion–Binary to Decimal Conversion–Octal Number System–Hexadecimal Number System– Codes–BCD Code–ASCII Code–Binary Arithmetic–Binary Addition–Subtraction, AND,OR Circuits using Diodes–NOT using Transistors–NAND,NOR and EXOR–Functions and their Truth Tables– NAND and NOR as Universal Gates.

UNIT-II BOOLEAN ALGEBRA AND ITS SIMPLIFICATION 13 Hrs

Boolean Algebra–De Morgan's Theorem and its Circuit–Duality Theorem, Simplification of Boolean Equations–Karnaugh Map–Pairs, Quads, Octets–Half Adder–Full Adder–Half Subtractor–Full Subtractor–Digital Computer–Parity Checker.

UNIT-III DATA PROCESSING CIRCUITS, COUNTERS AND REGISTERS 13 Hrs

Multiplexers – Demultiplexers–Decimal to BCD Encoder – Flip – Flops–RS Flip – Flops– Clocked RS Flip – Flops –D Flip – Flops–JK Flip – Flops – JK Master Slave Flip Flops – Shift registers – Counters–Asynchronous Counters–Omitted States–Modulus Counters–BCD Counters – Up Down Counters–Synchronous Counter–Decayed Counter–D/A Counter–A/D Counter.

UNIT-IV INTRODUCTION TO MICROPROCESSORS ANDPROGRAMMING TECHNIQUE 13 Hrs

Introduction to Microcomputers – Microprocessors and Assembly Languages – Microprocessor 8085 – Internal Architecture and its Operations – Programming Techniques such as Looping, Counting, and Indexing–Addressing Modes–Data Transfer Instructions–Dynamic Debugging.

UNIT-V ASSEMBLY LANGUAGE PROGRAMMING 12 Hrs

BCD to Binary and Binary to BCD Conversions–BCD to HEX and HEX to BCD Conversions–ASCII to BCD and BCD to ASCII Conversions–BCD to Seven Segment LED Code Conversions–Binary to ASCII and ASCII to Binary Conversions–Multi byte Addition–Muti byte Subtraction–BCD Addition–BCD Subtraction–Multiplication and Division.

Text Books

- Malvino and Leech. (2003). *Digital Principles and Application*. (4th ed.,). Tata McGraw Hill. New Delhi.
- Vijayendran, V. (2004). *Fundamental of Microprocessor 8085*. S.Viswanathan Publishers. Chennai.

Reference Books

- Gaonkar, R.S. (1990).*Microprocessor Architecture, Programming and Applications with 8085/8080A*. Wilwy Eastern Limited.
- Anokh Singh and Chabra, A.K. (2005).*Fundamentals of Digital Electronics and Microprocessors.* (2nd ed.,). S. Chand & Co Ltd. New Delhi.
- Metha,V.K. (2001).*Principle of Electronics*. S. Chand & Company Ltd. New Delhi.

MAJOR PRACTICAL VI

UPHR605

Semester : VI **Credit : 3**
Category : Core Practical-VI **Hours/Week: 3**
Class & Major: III B.Sc Physics **Total Hours: 39**

Objectives:

To enable the Students

- Understand the theoretical concepts of electronics by experiments
- Execute the simple real time programs using microprocessor 8085

1. AND, OR, NOT Gates-Verification of Truth Tables.
2. Universal Building Block NAND and NOR gates.
3. Construction of Half and Full Adders using NAND Gate - Verification of Truth Tables.
4. Construction of RS, JK and D Flip Flop.
5. Program for Code Conversion (BCD to HEXA,ASCII to BCD)using 8085.
6. Program for Code Conversion (BCD to Binary,8-bit Subtraction using 8085.
7. Program for Code Conversion (HEXA to BCD, BCD to ASCII) using 8085.
8. Program for (Binary to BCD) and 8-bit Addition using 8085.

Text Book

- Srinivasan, N.Balasubramanian, S. and Ranganathan,R. (2006).*The Text Book of Practical Physics.* Sultan Chand &Sons.

Reference Books

- Ouseph, C.C. and Rangarajan,G. (1990). *A Text Book of Practical Physics*. Viswanathan Publishers – Part I.
- Gaonkar, R.S. (1990).*Microprocessor Architecture. Programming and Applications with 8085/8080A*. Wily Eastern Limited.

NANOPHYSICS

UPHO601

Semester :VI **Credit : 4**
Category : Core Elective **Hours/Week : 5**
Class & Major: III B.Sc Physics **Total Hours :65**

Objectives:
To enable the students

- Provide basic ideas on Nanotechnology and Nanoscience.
- Introduce the Potential Applications of Nanotechnology.

UNIT-I NANOSCALE SYSTEMS **13 Hrs**

Length, Energy, and Time Scales – Quantum Confinement of Electrons in Semiconductor Nanostructures: Size Effect and Properties of Nanostructures–Top Down and Bottom Up Approach.

UNIT-II QUANTUM DOTS **13 Hrs**

Excitons and Excitonic Bohr Radius – Difference between Nanoparticles and Quantum Dots – Preparation through Colloidal Methods – Epitaxial Methods– MOCVD and MBE Growth of Quantum Dots –Spectroscopy of Quantum Dots: Absorption and Emission Spectra –Photo Luminescence Spectrum –Optical Spectroscopy.

UNIT-III NANOTUBES **13 Hrs**

Single Walled and Multi Walled Nanotubes (SWNT and MWNT) –Synthesis and Purification –Synthesis of Carbon Nanotubes –Pyrolysis Technique –Arc–Discharge Method – Nanowires – Preparation – VLS mechanism of Growth –Self Assembled Monolayers – Electrochemical Techniques.

UNIT-IV CHARACTERIZATION **13 Hrs**

SEM– Principle of Transmission Electron Microscopy (TEM) and High Resolution TEM– Principle and Working of Atomic Force Microscopy (AFM) and Scanning Probe Microscopy (SPM) –Near Field Scanning Optical Microscopy –Applications to Nanostructures.

UNIT-V NANOTECHNOLOGY **13 Hrs**

Applications of Nanoparticles, Quantum Dots, Nanotubes and Nanowires for Nano device Fabrication –Nanoparticles based Solar Cells and Quantum Dots based White LEDs – CNT based Transistors.

Text Book

- Timp, G.(1999). *Nanotechnology.* AIP Press. Springer-Verlag. Editor. New York.

Reference Books

- Edelstein, A.S. (1996). *Nanomaterials Synthesis Properties and Applications.* A.S Edelstein. IOP Publishing. UK.
- Hari Singh, N. (2002). *Nano structured Materials and Nanotechnology*. Concise Edition. Academic Press. USA.
- Dinardo, J.Weinheim, (2000). *Nanoscale Characterization of Surfaces & Interfaces*. Wiley-VCH.(2nded,). Cambridge.

ASTROPHYSICS

UPHO602

Semester :VI **Credit : 4**
Category : Core Elective **Hours/Week : 5**
Class & Major: III B.Sc Physics **Total Hours :65**

Objectives:

To enable the students

- Understand basis ideas of Astrophysics and its measurements.
- Analyze the concepts of Stellar Evolution and Solar Systems.
- Acquire the knowledge of Galaxies and its Formations.

UNIT-I NATURE OF ASTROPHYSICS 13 Hrs

The Nature of Astrophysics, Scale of the Universe, Angular Measure, Parallax, Inverse Square Law of Light and the Definition of Flux, Brightness and the Magnitude system– Magnitudes and Colors, Distance Modulus, Electromagnetic Radiation, Black Body Radiation, Spectroscopy –Kirchhoff's Law.

UNIT-II SOLAR SYSTEM 12 Hrs

Surface Features of the Sun in White and Monochromatic Light, Internal Structure, Photosphere – Sunspots and Magnetic Fields on the Sun –Solar Activity, Planets and their Satellites –Surface Features, Internal Structure, Atmosphere and Magnetic Fields of Earth, Moon and Planets – Origin of Solar Systems.

UNIT-III STELLAR SPECTRA 15 Hrs

HR Diagram, HD & MK Spectra Classification of Stellar Spectra –Radiations Law and Basic Ideas of Spectral Lines Formation – Explanation of Stellar Spectra in terms of Boltzmann and Saha Equation.

UNIT-IV STELLAR EVOLUTION 12 Hrs

Stellar Structure, Nuclear Reactions, HSEQ, Radiation Transport –Stellar Evolution, Degeneracy Pressure, Mass– Limits for Stars – More Stellar Evolutions – High Mass Stars and Compact Objects, Supernova and Stellar Clusters, Inter Stellar Medium.

UNIT-V THEORIES OF UNIVERSE 13 Hrs

The Milky Way –Black Holes, White Dwarfs and Neutron Stars – Other Galaxies – Clusters of Galaxies, the Hubble Law – Cosmology and the Big Bang Theory.

Text Books

- Krishnasamy, K.S. (2002). *Astrophysics a Modern Perspectives*. Reprint New Age International (P) Ltd. New Delhi.
- Baidyanath B. (2001). *An Introduction to Astrophysics*. Prentice Hall of India Private Ltd. New Delhi. 2nd Printing.
- Murugasen, R. (2003). *Modern Physics*. S. Chand& Co Ltd. (11th Revised ed.,). New Delhi.

Reference Books

- Kumaravelu, S. (1993). *Astronomy*. Janki Calendar Corporation. Sivasakthi.
- Baker and Fredrick, (1964). *Astronomy*. (9th ed.,). Van No Strand Rein Hold &Co. New York.

FUNCTIONAL MATERIALS

UPHO603

Semester	**: VI**	**Credits**	**: 4**
Category	**: Core Elective**	**Hours/Week**	**: 5**
Class&Major:	**III B.Sc Physics**	**Total Hours**	**: 65**

Objectives:

To enable the students

- Acquire the Knowledge about the Properties of Functional Materials.
- Analyze the Properties of Different Materials.
- Apply the Concepts of Materials in Different Applications.

UNIT - I OPTICAL MATERIALS 11 Hrs

Introduction to Optical Materials – Absorption and Emission Process– Luminescence –Types of Luminescence (Qualitative) – Mechanism of Fluorescence and Phosphorescence Process – Quantum Efficiency (Statement only) - Phosphors – LED (Principle, Construction and Working) –White LED –Applications.

UNIT – II SUPERCONDUCTING MATERIALS 14 Hrs

Introduction to Superconductivity – Occurrence of Superconductivity – Transition Temperature –Properties – BCS Theory – Type I and II Superconductors – High Temperature Superconductors – Structure and Properties of $YBa_2Cu_3O_{9-X}$ and $HgBa_2CaCuO_6$Compounds – Applications – SQUID, Cryotron, Magnetic Levitation – Other Applications.

UNIT – III DIELECTRIC MATERIALS 14 Hrs

Dielectric Materials – Types – Local (Internal) Field – Classsius–Mossotti Relation– Dielectric Breakdown – Dielectric Loss – Piezoelectric, Pyroelectric, Ferroelectric, Thermoelectric Materials – Applications –Super capacitors and Transformer.

UNIT – IV BIOMATERIALS 13 Hrs

Introduction to Biomaterials – Physiochemical Parameters of Biomaterials – Concepts of Biocompatibility – Types – Biometals and Alloys – Bio Glass and Bioglass Ceramics – Biopolymer and Bio Composites – Hydroxyapatite and Tricalcium Phosphate-Properties and Application.

UNIT –V MODERN FUNCTIONAL MATERIALS **13 Hrs**

Properties and applications of Electro–Optic Materials – Magneto–Optic Materials – Photoconductive Polymers – Carbon Nanotubes (Single and Multi-Walls) – Composite Materials – Particle and Fibre Reinforced Composite Materials and its Applications.

Text Books

- Rajendiran, V. (2015). *Material Science*. Tata McGraw Hill.
- Ragavan, V. (2013). *Materials Science and Engineering*. PHI Learning Private Ltd.

Reference Books

- Kasab, S.O. (2015).*Principles of Electronic Devices.* Tata McGraw Hill.
- William D. Callister, David G. Rethwisch. (2013). *Materials Science and Engineering.* Wiley-India.
- Palanisamy, P.K. (2010).*Materials Science*. Scitech Publications (India).

III and IV EVALUATION COMPONENTS OF CIA

Semester	Category	Course Code	Course Title	Component-III	Component-IV
V	Core VIII	UPHM501	Quantum Mechanics and Relativity	Problem Solving	Problem Solving
	Core IX	UPHM505	Basic Electronics	Seminar	Model display
	Core X	UPHM506	Solid State Physics	Poster Presentation	Seminar
VI	Core XII	UPHM609	Numerical Methods and Basic Computational Physics	Assignment	Problem solving
	Core XIII	UPHM611	Nuclear and Radiation Physics	Poster Presentation	Seminar
	Core XIV	UPHM612	Material Science	Seminar	Poster Presentation
	Core XV	UPHM613	Digital Electronics	Model Display	Seminar
	Major Optional	UPHO601/ UPHO602/ UPHO603	Nanophysics/ Astrophysics/ Functional Materials	Seminar	Poster Presentation

DEPARTMENT OF COMPUTER SCIENCE

PREAMBLE

UG : Programme Profile and Syllabi of courses offered in V& VI semesters along with evaluation components III &IV (With effect from 2018-2021 batch onwards).

PROGRAMME PROFILE B.Sc Computer Science

PROGRAMME SPECIFIC OUTCOMES (PSO)

Upon Completion of the Programme, the Students will able to

- Understand, analyze, design, develop and optimize solutions related to Computer programming languages.
- Apply the concepts in core areas related to computer programming for efficient design of computer-based systems of varying complexity.
- Test the technical issues in Software Engineering and deliver a quality product for business success.
- Innovate and develop new technologies.

Semester	Part	Category	Course Code	Course Title	Previous Course Code	Contact Hrs/ Week	Credit Min/Max
I	I	Language	UTAL105/ UTAL106/ UHIL101/ UFRL101	Basic Tamil-I/ Advanced Tamil-I/ Hindi-I/ French-I	-	4	2/3
	II	English	UENL107/ UENL108	General English-I/ Advanced English-I	-	5	¾
	III	Core I	UCSM106/ UCAM107	Programming in C	UCSM104	6	5
	III	Core II	UCSM107/ UCAM108	Fundamental of Computer Science	UCSM105	5	4
			UCSM108/ UCAM109	Advanced Computer Science	UCSM106		
	III	Core III	UCSR109/ UCAR105	Programming in C - Practical	UCSR107	3	2
	III	Allied I	UMAA113	Statistical Methods	-	5	4
	IV	Value Education				2	1
					Total	**30**	**21/23**
II	I	Language	UTAL205/ UTAL206/ UHIL201/ UFRL201	Basic Tamil-II/ Advanced Tamil-II/ Hindi-II/ French-II	-	4	2/3
	II	English	UENL207/ UENL208	General English-II/ Advanced English-II	UENL205/ UENL206	5	3/4
	III	Core IV	UCSM206/ UCAM205	Data Structures	UCSM205	6	6
	III	Core V	UCSR206/ UCAR204	Data Structures - Practical	UCSR204	4	3

	III	Allied II	UMAA210	Mathematics for Computer Science	-	5	4
	IV	Non Major Elective				4	2
	IV	Soft Skill				2	1
	V	Extension Programme / Physical Education/ NCC				-	1/2
					Total	**30**	**22/25**
III	I	Language	UTAL305/ UTAL306	Basic Tamil-III / Advanced Tamil–III	-	4	2/3
			UHIL301/ UFRL301	Hindi-III / French-III	-		
	II	English	UENL307/ UENL308	General English-III/ Advanced English-III	UENL305/ UENL306	5	¾
	III	Core VI	UCSM305/ UCAM310	Java Programming	UCSM304	5	5
	III	Core VII	UCSM306	Microprocessor and its Applications	UCSM608	4	4
	III	Core VIII	UCSR308/ UCAR304	Java Programming – Practical	UCSR305	4	3
	III	Allied III	UPHA304	Digital Electronics	UPHA303	3	3
	III	Allied IV	UPHR304	Digital Electronics – Practical	-	3	2
	IV	Value Education				2	1
					Total	**30**	**23/25**
IV	I	Language	UTAL405/ UTAL406/	Basic Tamil-IV / Advanced Tamil–IV	-	4	2/3
			UHIL401/ UFRL401	Hindi-IV / French-IV	-		
	II	English	UENL407/ UENL408	General English-IV / Advanced English-IV	UENL405/ UENL406	5	¾
	III	Core IX	UCSM408	Graphics & Multimedia	UCSM608/ UCSM610	6	6
	III	Core X	UCSM409/ UCSM609	Operating System	UCSM506	5	5
	III	Core XI	UCSR411	Operating System & Graphics Lab	UCSR606	5	3
	IV	Online courses		NPTEL/SPOKEN TUTORIAL/SWAYAM		3	½
		Soft skill				2	1
	V	Extension Programme / Physical Education				-	0/2
					Total	**30**	**21/26**
V	III	Core XII	UCSM506	Middleware Technologies	-	5	5
	III	Core XIII	UCSM509	Database Systems	UCSM407	5	4
	III	Core XIV	UCSM510	Computer Networks	UCSM506	5	5
	III	Core XV	UCSM511	Software Engineering	UCSM504	5	4

	III	Core XVI	UCSR509	Middleware Technologies – Practical	-	4	3
	III	Core XVII	UCSR511	Database Systems-Practical	UCSR404	4	3
	IV	Value Education				2	1
					Total	**30**	**25**
VI	III	Core XVIII	UCSM612	Cloud Computing	-	5	5
	III	Core XIX	UCSM613	Open Source Technology	UCSM508	5	5
	III	Core XX	UCSM610	Big Data Tools	-	4	4
	III	Core XXI	UCSR607	Open Source Technology-Practical	UCSR508	4	3
	III	Core XXII	UCSP601	Project		5	5
	III	Major-Elective	(UCSO606/ UCAO606)/ UCSO607/ UCSO608	Network Security / Mobile Computing /Internet of Things	-	5	4
	III	Viva – Voce	UCSM611	Comprehensive Viva Voce	-	-	1
	IV	Soft skill				2	1
	V	Extension Programme / Physical Education/ NCC				-	0/2
					TOTAL	**30**	**28/30**
					GRAND TOTAL	**180**	**140/154**

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	UCSA104	C Programming	-	3	3
	I	Allied Practical	UCSR110	C Programming Lab	-	3	2
	II	Allied	UCSA204	Object Oriented Programming	-	3	3
	II	Allied Practical	UCSR207	Object Oriented Programming – Lab	-	3	2
	III	Allied	UCSA305	Fundamentals of Blockchain Technology	-	3	3
	III	Allied Practical	UCSR309	Blockchain Technology Using Solidity – Lab	-	3	2
	IV	Allied	UCSA406	Digital Marketing Analytics	-	3	3
	IV	Allied Practical	UCSR412	Web Design - Lab	-	3	2
	V	Allied	UCSA509	Business Analytics and Intelligence.	UCSA508	3	3
	V	Allied Practical	UCSR512	Business Analytics and Intelligence using SAS - Lab	UCSR511	3	2

BBA, B.Com and Economics	IV	Allied	UCSA407	Cyber Security in Finance	-	3	3
	IV	Allied Practical	UCSR413	Cyber Security Lab	-	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	2T+2P	2
			UCSE207	Python Programming	UCSE203	4P	2
			UCSE208	R Programming	UCSE204	4P	2
			UCSE209	Arduino Programming	UCSE205	4P	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

Inclusion of Experiential Learning

A. Experiential Learning (Mandatory)

Course Mapping				Collaborating Agency - MSME		
Sem	**Course Code**	**Course Title**	**Assessment**	**Course Title**	**Hours/Days /Month**	**Mode of Evaluation**
VI	UCSM610	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	Hours/ Days/Month	Mode of Evaluation	Credits (Min/Max)
V	Core	UCST501	Robotics Process Automation	**MSME**	4 Days	Reflection	1

MIDDLEWARE TECHNOLOGIES

UCSM506

Semester : V **Credit : 5**
Category : Core IX **Hours / Week : 5**
Class & Major : III B.Sc CS **Total Hours : 65**

Objectives:

To enable the students

- Understand Principles of programming using a .NET Framework.
- Analyze the importance of server side programming and web development.
- Develop applications for distributed environments.

Learning Outcomes:

On Completion of the course, the students will be able to

- Ability to study the set of services that a middleware system constitutes of.
- Understand how middleware facilitates the development of distributed applications in heterogeneous environments.
- Design the basics of Web services that are the most oft-used middleware technique.

UNIT - I .NET FRAMEWORK **12 Hrs**

Introduction to .NET – Benefits of .NET Framework – The ASP.NET Technologies – The ASP.NET Life Cycle – Understanding ASP.NET 4.0 Page Directives –Working with Server Controls – Implementing Code Sharing- Compilation in ASP.NET 4.0.

UNIT - II APPLICATION STRUCTURE AND STATE **12 Hrs**

Structure of an Application - The Application Domain - The Application Lifetime - The Application Directory Structure - The Global. asax Application File - Using States - HTTP Handlers - Postback and Cross-Page Posting.

UNIT - III WEB STANDARD CONTROLS **15 Hrs**

The Control Class - The Web Control Class - Label - Button – Text Box - Literal – Place Holder - Hidden Field - File Upload - Image - Image Button - Image Map - ListBox – Drop Down List – Bulleted List – Hyper Link – Link Button – Check Box – Check Box List – Radio Button – Radio Button List – Table – Panel – Wizard - Xml – View – Multi View – Substitution – Localize – Calendar – Ad Rotator.

UNIT - IV OTHER WEB CONTROLS **13 Hrs**

Navigation Controls: Tree View – Menu – Site MapPath. Validation Controls: Base Validator – Required Field Validator- Range Validator – Regular Expression Validator – Compare Validator – Custom Validator – Validation Summary.

UNIT - V DATABASE CONTROLS **13 Hrs**

Working with Database Controls: Grid View - Data List - Details View - Form View – List View- Repeater – Data Pager – Chart – Query Extender –Sql Data Source – Access Data Source- Link Data Source – Object Data Source – Xml Data Source – Entity Data Source – Site Map Data Source.

Text Book

- Kogent. *(2012), ASP.NET 4.0 Black Book.* Dreamtech Press publications.

Reference Book

- Kogent.*(2011), .NET 4.0 programming (6-in-1) Black book.* Dreamtech Press publications.

E- Resource

- https://www.tutorialspoint.com/asp.net/asp.net_tutorial.pdf

DATABASE SYSTEMS

UCSM509

Semester	**: V**	**Credits**	**: 4**
Category	**: Core XIII**	**Hours/Week**	**: 5**
Class& Major	**: III B.Sc Computer Science**	**Total Hours**	**: 65**

Objectives:

To enable the students

- Understand the concepts of DBMS
- Design the ER diagram for database
- Create database using SQL queries and normal forms

Learning Outcomes:

On Completion of the course, the students will be able to

- Understand DB concepts and structures and also query language
- Apply various normalization techniques
- Design and build a simple database

UNIT - I INTRODUCTION **8 Hrs**

Purpose of database system – Data models – database languages – Transaction management – Storage management – DBA – Database users – System structure.

UNIT - II RELATIONAL DATABASE **9 Hrs**

Structure – Fundamental and Additional Relational Algebra operations – Tuple Relational Calculus – Domain Relational Calculus.

UNIT - III DATABASE DESIGN AND ER MODEL **10 Hrs**

Overview of design process – Entity relationship model – Mapping Cardinalities – ER Diagrams – Extended ER Features.

UNIT - IV RELATIONAL DATABASE DESIGN **12 Hrs**

Features of good relational designs – Decomposition using functional dependencies –Functional Dependencies – Normal forms based on primary keys – second & third Normal forms – Boyce-codd Normal Form – Properties of Relational Decompositions – Multi-valued Dependencies & Fourth Normal Form – Join Dependencies & Fifth Normal Form.

UNIT -V SQLAND ORACLE **13 Hrs**

Basic Structure of SQL Queries – Set operations – Aggregate functions – Null values –nested sub queries – Complex Queries – Views – Modification of Databases – Joined Relations. **Advanced SQL:** Embedded SQL – Dynamic SQL – Oracle - Introduction – SQL (DDL, DML, DCL Commands) – Integrity Constraints – PL/SQL – PL/SQL Block – Procedure, Function – Cursor management – Triggers – Exception Handling.

Text Book

- Abraham Silberchatz, Henry F. Korth, S. Sudharshan. (2005). *Database System Concepts*. (5^{th}ed.,). McGraw Hill. New Delhi.

Reference Book

- Elmasri, Navathe, Somayajulu, Gupta.(2008**).** *Fundamentals of Database Systems*.(4^{th}ed.,). Pearson Education. New Delhi.

E-Resources

- http://www.w3schools.com/html/
- http://codex.cs.yale.edu/avi/db-book/db6/slide-dir/
- http://engineerportal.blogspot.in/2013/09/database-system-concepts-6th-edition.html

COMPUTER NETWORKS

UCSM510

Semester	**: V**	**Credits**	**: 5**
Category	**: Core XIV**	**Hours/Week**	**: 5**
Class &Major	**: III B.Sc (CS)**	**Total Hours**	**: 65**

Objectives:

To enable the students

- Understand the concepts of computer networks and layered approach
- Apply signals for transfer data between nodes
- Implement routing entries given a simple example of network topology

Learning Outcomes:

On Completion of the course, the students will be able to

- Learn the concepts of computer network hardware and software operate
- Investigate the fundamental issues driving network design
- Apply the network technologies in various development

UNIT- I INTRODUCTION TO NETWORK **14 Hrs**

Introduction to network: Uses - Network Hardware: LAN – WAN – MAN – Wireless – Home Networks. Network Software: Protocol Hierarchies – Design Issues for the Layers – Connection-oriented and connectionless services – Service Primitives – The Relationship of services to Protocols. Reference Models: OSI Reference Model – TCP/IP reference Model – Comparison of OSI and TCP/IP – Critique of OSI and protocols – Critique of the TCP/IP Reference model

UNIT- II PHYSICAL LAYER **12 Hrs**

Physical layer: Guided Transmission Media: Magnetic Media – Twisted Pair Coaxial Cable – Fiber Optics. Communication Satellites: Geostationary, Medium – Earth Orbit, Low Earth Orbit – Public Switched Telephone Network: Structure of telephone network – local loops – Modems – Switching techniques.

UNIT- III DATA LINK LAYER **12 Hrs**

Data link layer: Data link layer design issues – Error Detection and correction – Medium Access Control Sub Layer: Multiple Access Protocols – ALOHA – Wireless LAN Protocols. Bluetooth: Bluetooth Architecture – Bluetooth application.

UNIT- IVNETWORK LAYER **15 Hrs**

Network Layer: Routing algorithms: The optimality Principle – Shortest path routing – Routing for mobile hosts – Congestion Control Algorithms. Transport Layer: The Transport 57 Service –Services Provided to the Upper Layers. TCP: Introduction to TCP – The TCP Service Model – The TCP Protocol – TCP Connection Establishment and Connection Release.

Application Layer: DNS – The Domain Name System

UNIT- V ROUTING **12 Hrs**

ROUTING: Routing (RIP, OSPF, metrics)–Switch basics–Global Internet (Areas, BGP,IPv6), Multicast – addresses – multicast routing (DVMRP, PIM)

Text Books

- James F. Kurose, Keith W. Ross. (2009). *Computer Networking – A Top-Down Approach Featuring the Interne*. (5th ed.,). Pearson Education.

Reference Books

- Behrouz A. Forouzan. (2011). *Data communication and Networking*. (4th ed.,).Tata McGraw – Hill.

E-Resources

- http://www.w3schools.com/html/
- https://www.tutorialspoint.com/data_communication_computer_network/data_communication_computer_network_tutorial.pdf

SOFTWARE ENGINEERING

UCSM511

Semester	**: V**	**Credits**	**:4**
Category	**: Core XV**	**Hours/Week**	**: 5**
Class & Major: III B.Sc CS		**Total Hours**	**: 65**

Objectives:

To enable the students

- Define the requirements of software
- Analyse the role of project management including planning, scheduling, risk management, etc
- Evaluate the software measurement and software risks

Learning Outcomes:

On Completion of the course, the students will be able to

- Identify the phases in a software project
- Apply the requirements engineering and Analysis Modeling.
- Implement the software engineering to adopt to readily changing environments using the appropriate theory principles and processes

UNIT - I SOFTWARE PROCESS AND AGILE DEVELOPMENT **10Hrs**

Introduction to Software Engineering, Software Process, Perspective and Specialized Process Models –Introduction to Agility-Agile process-Extreme programming-XP Process.

UNIT- II REQUIREMENTS ANALYSIS AND PECIFICATION 15Hrs

Software Requirements: Functional and Non-Functional, User requirements, System requirements, Software Requirements Document – Requirement Engineering Process: Feasibility Studies, Requirements elicitation and analysis, requirements validation, requirements management-Classical analysis: Structured system Analysis, Petri Nets- Data Dictionary.

UNIT- III SOFTWARE DESIGN 10 Hrs

Design process – Design Concepts-Design Model– Design Heuristic – Architectural Design -Architectural styles, Architectural Design, Architectural Mapping using Data Flow-User Interface Design: Interface analysis, Interface Design –Component level Design: Designing Class based components, traditional Components.

UNIT -IV TESTING AND MAINTENANCE 15 Hrs

Software testing fundamentals-Internal and external views of Testing-white box testing – basis path testing-control structure testing-black box testing- Regression Testing – Unit Testing – Integration Testing – Validation Testing – System Testing And Debugging –Software Implementation Techniques: Coding practices-Refactoring-Maintenance and Reengineering-BPR model-Reengineering process model-Reverse and Forward Engineering.

UNIT- V PROJECT MANAGEMENT 15 Hrs

Software Project Management: Estimation – LOC, FP Based Estimation, Make/Buy Decision COCOMO I & II Model – Project Scheduling – Scheduling, Earned Value Analysis Planning – Project Plan, Planning Process, RFP Risk Management – Identification, Projection – Risk Management-Risk Identification-RMMM Plan-CASE TOOLS

Text Book

- Roger S. Pressman. (2010). S*oftware Engineering – A Practitioner's Approach.* (7^{th} ed.,). McGraw-Hill International Edition.

Reference Books

- Rajib Mall. (2009). *Fundamentals of Software Engineering*. (3^{rd} ed.,). PHI Learning Private Limited.

E-Resources

- https://sovannarith.files.wordpress.com/2012/07/software-engineering-9th-ed-intro-txt-i-sommerville-pearson_-2011-bbs.pdf
- http://dinus.ac.id/repository/docs/ajar/Sommerville-Software-Engineering-10ed.pdf
- http://dinus.ac.id/repository/docs/ajar/RPL7th_ed_software_engineering_a_practitioners_approach_by_roger_s._pressman_.pdf

MIDDLEWARE TECHNOLOGIES – PRACTICAL

UCSR509

Semester	**: V**	**Credits**	**: 3**
Category	**: Core Practical VII**	**Hours/Week**	**: 4**
Class & Major	**: III B.Sc CS**	**Total/Hours**	**: 52**

Objectives:

To enable the students

- Improve the programming skills in NET.
- Design a database with enhanced models and techniques.
- Create web based applications for distributed environments.

Learning Outcomes:

On Completion of the course, the students will be able to

- Implement the set of services that a middleware system constitutes of.
- Understand how middleware facilitates the development of distributed applications in heterogeneous environments.
- Design the basics of Web services that is the most oft-used middleware technique.

LAB EXERCISES:

1. Create a feedback application using web controls.
2. Create a web page using Image map and calendar control.
3. Create a web page using File Upload, Hyperlink and Link button.
4. Creating and Using a Simple User Control.
5. ADO.NET application to insert, delete, update records in database.
6. Create a simple web page using all validation controls.
7. Create a web page using ad rotator & menus.
8. Create a web page using grid view, form view, detail view and list view.
9. Data List and Repeater control.
10. Create a web page to manage the session.

DATABASE SYSTEMS – PRACTICAL

UCSR511

Semester	**: V**	**Credit**	**: 3**
Category	**: Core Practical XVII**	**Hours/Week**	**: 3**
Class & Major	**: III B.Sc Computer Science**	**Total Hours**	**: 39**

Course Objectives:

To enable the students

- Develop practical skills on various queries, views ,indexes, triggers in SQL
- Design the database for different application.
- Implement the techniques to access the database

Learning Outcomes:

On Completion of the course, the students will be able to

- Understand, appreciate and effectively the concepts of database technologies
- Design and implement a database schema for a given problem domain
- Implement PL/SQL including procedures, functions, cursors and packages

Lab Exercises

1. Create a Student Information and Mark Details database using DDL, DML, TCL and DCL.
2. Create a Library database and perform the Aggregate Function & SET Operations.
3. Create a Hospital database and perform the Inner and Outer Joins Operations.
4. Create Bank database and query it using Group by having and Order by.
5. Create Employee database and query it using sub queries.
6. Create Views and indexes for the Phone Directory database.
7. Create PL/SQL Block for Mark Sheet processing.
8. Create the Procedures for Stock Management database.
9. Create the Functions for Real Estate database.
10. Create different types of Triggers for Event Management database.

Note: All the tables should be created with Constraints.

CLOUD COMPUTING

UCSM612

Semester : VI **Credit : 5**
Category : Core XVIII **Hours/Week : 5**
Class & Major : III B.Sc CS **Total Hours : 65**

Objectives:

To enable the students

- Understand the concepts of cloud computing
- Appreciate the evolution of cloud from the existing technologies
- Analyze the services on the various issues in cloud computing

Learning Outcomes:

On Completion of the course, the students will be able to

- Understand the services of cloud computing
- Apply the architecture of compute and storage cloud, service and delivery models
- Evaluate the various ideas of cloud computing, paradigm, benefits, current and future challenges

UNIT- I INTRODUCTION **12 Hrs**

Cloud Computing Foundation: Introduction to Cloud Computing. Evolution of Cloud Computing: Hardware Evolution - Internet Software Evolution - Server Virtualization

UNIT- II WEB SERVICES DELIVERED FROM THE CLOUD **13 Hrs**

Communication-as-a-Service (CaaS)- Infrastructure-as-a-Service (IaaS)- Monitoring-as-a-Service (MaaS)- Platform-as-a-Service (PaaS)- Software-as-a-Service (SaaS).Building Cloud Networks: Cloud Data Center- Collaboration- Service-Oriented Architectures- Data Center-Based SOA- Open Source Software Is Used

UNIT- III FEDERATION, PRESENCE AND PRIVACY IN THE CLOUD **13 Hrs**

Federation in the Cloud: Four Levels of Federation- Federated Services and Applications-Protecting and Controlling- Future of Federation. Presence in the Cloud: Presence Protocols-Leveraging Presence- Presence Enabled Future of Presence- Identity-as-a-Service (IaaS)-Compliance-as-a-Service (CaaS)- Future of Identity. Privacy to Cloud-Based: Privacy Risks and the Cloud- Protecting Privacy information- Future of Privacy

UNIT -IV SECURITY IN THE CLOUD **14 Hrs**

Cloud Security Challenges- Software-as-a-Service Security: Security Management (People)-Security Governance -Risk Management -Risk Assessment -Security Awareness -Education and Training -Secure Software Development Life Cycle (Sec SDLC)- Security Architecture Design- Security Images -Data Privacy - Data Security - Application Security-Virtual Machine Security.

UNIT- V FOG AND EDGE COMPUTING **13 Hrs**

Internet of Things and new Computing Paradigm – Addressing the Challenges in Federating Edge Resources – Integrating IOT, Cloud Infrastructures – Management and Orchestration of Network Slices in 5G,Fog,Edge and Clouds- Optimization problems in Fog and Edge Computing.

Text Books

- Rittinghouse, John W, & James F. Ransome. (2017).*Cloud Computing:implementation. Management and Security*. CRC Press.
- Rajkumar Buyya,Satish Narayana Sriama. (2019). *Fog and Edge Computing. Principles and Paradigms*.wiley Publication.

Reference Book

- Rajkumar Buyya, Christian Vecchiola, S. Thamarai Selvi.(2013). *Mastering Cloud Computing*. Tata Mcgraw Hill.

E-Resources

- http://www.w3schools.com/html/
- https://www.tutorialspoint.com/cloud_computing/index.htm

OPEN SOURCE TECHNOLOGY

UCSM613

Semester : VI	**Credit : 5**
Category : Core XIX	**Hours/Week : 5**
Class & Major : III B.Sc CS	**Total Hours : 65**

Objectives:

To enable the students

- Understand the context and operation of open source software communities and associated software projects.
- Analyze the familiar queries with participating in a J Query
- Apply the scripting language like J Son or Perl

Learning Outcomes:

On Completion of the course, the students will be able to

- Define a basic idea of open source technology and their software development process
- Understand the role and future of open source software
- Develop web page with dynamic changes

UNIT – I INTRODUCTION **13 Hrs**

Introduction- open source-PHP – history – features – variables – statements – operators conditional statements – if – switch – nesting conditions – merging forms with conditional statements – loops – while do – for loop iteration with break and continue.

UNIT – II ARRAYS AND FUNCTIONS **13 Hrs**

Arrays: Creating an array – modifying array – processing array – grouping form with arrays – using array functions – creating user defined functions – using files – sessions – cookies – executing external programs – Creating sample applications using PHP.

UNIT – III MYSQL **13 Hrs**

Effectiveness of MySQL – MySQL Tools – Prerequisites for MySQL connection – Databases and tables – MySQL data types – Creating and manipulating tables – Insertion, updation and deletion of rows in tables – Retrieving data – Sorting and filtering retrieved data – Advanced data filtering – Data manipulation functions – Aggregate functions – Grouping data – Sub queries – Joining Tables – Set operators – Full text searching.

UNIT – IV PHP WITH MYSQL **13 Hrs**

Working MySQL with PHP – database connectivity – usage of MYSQL commands in PHP, processing result sets of queries –handling errors – debugging and diagnostic functions – validating user input through Database layer and Application layer – formatting query output with Character, Numeric, Date and time – sample database applications.

UNIT – V J QUERY USER INTERFACE **13 Hrs**

Intro to jQuery UI – Need of jQuery UI in real web sites – Downloading and Importing j Query UI – Draggable – Droppable – Resizable – Selectable – Sortable – Accordion – Auto Complete – Date Picker – Dialog – Menu – Progress Bar – Slider – Spinner – Tabs – Tooltip – Color Animation – Easing Effects – addClass – removeClass – Effects – jQuery UI themes – Customizing jQuery UI widgets / plug-ins – jQuery UI with CDN – Consuming jQuery Plug-– Regular expressions.

Text Books

- VikramVaswani,. (2015). *PHP and MySQL*. Tata McGraw-Hill.
- Ben Forta.(2016). *MySQL Crash course* SAMS.
- Dan Wellman. (2016). *jQuery UI 1.8: The User Interface Library for jQuery*. Packt Publishing. Brimingham–Mumbai.
- Rebecca Murphey. (2017). *jQuery Fundamentals.(1st ed.,).* Superhero Labs Publisher.

Reference Books

- Tim Converse, Joyce Park and Clark Morgan. (2008). *PHP 5 and MySQL*. Wiley India reprint. Robert Sheldon. Geoff Moes.

E-Resources

- http://www.w3schools.com/html/
- https://www.tutorialspoint.com/basics_of_computers/basics_of_computers_open_source_software.htm

BIGDATA TOOLS

UCSM610

Semester	**: VI**	**Credit**	**:4**
Category	**: Core XIV**	**Hours/week**	**:4**
Class & Major	**: III B.Sc CS**	**Total Hours**	**:52**

Objectives:

To enable the students

- Understand the basics concepts of Big data use cases and solutions.
- Build and maintain reliable, scalable, distributed systems with Apache Hadoop and also write Map-Reduce based Applications.
- Learn difference between conventional SQL and No SQL (MongoDB) query language.
- Design Mongo DB based Big data Applications.

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 understand and apply scaling up Hadoop techniques and associated computing techniques and technologies.

- Ability to solve problems associated with batch learning and online learning, and the big data characteristics such as high dimensionality, dynamically growing data and in particular scalability issues.

UNIT - I INTRODUCTION **10 Hrs**

Introduction– distributed file system–Big Data and its importance, Four Vs, Drivers for Big data, Big data analytics, and Big data applications. Algorithms using Map Reduce

UNIT - II HADOOP **11 Hrs**

Big Data – Apache Hadoop & Hadoop EcoSystem– Moving Data in and out of Hadoop – Understanding inputs and outputs of Map Reduce - Data Serialization.

UNIT - III HDFS, HIVE AND HIVEQL, HBASE **10 Hrs**

HDFS-Overview, Installation and Shell, Java API; Hive Architecture and Installation, Comparison with Traditional Database, HiveQL Querying Data- Sorting And Aggregating, Map Reduce Scripts, Joins & Subqueries, HBase concepts- Advanced Usage, Schema Design, Advance Indexing- PIG, Zookeeper- how it helps in monitoring a cluster, H Base uses Zookeeper and how to Build Applications with Zookeeper.

UNIT - IV SPARK & NoSQL **10 Hrs**

Introduction to Data Analysis with Spark, Downloading Spark and Getting Started, Programming with RDDs, Machine Learning with MLlib. NoSQL – Uses - Types of NoSQL databases - Advantages of NoSQL, Use of NoSQL in Industry, SQL vs NoSQL, New SQL

UNIT - V DATA BASE FOR THE MODERN WEB **11 Hrs**

Introduction to Mongo DB - key features, Core Server tools - Creating and Querying through Indexes, Constructing queries on Databases - Collections and Documents - MongoDB Query Language.

Text Books

- Chris Eaton, Dirk derooset al.(2012).*Understanding Big data*. McGraw Hill.
- Boris lublinsky, Kevin t. Smith, Alexey Yakubovich, *Professional Hadoop Solutions*. Wiley.
- Sima Acharya, Subhashini Chhellappan. Willey Mongo DB in Action. Kyle Banker. Piter Bakkum , *BIG Data and Analytics*. Shaun Verch. Dream tech Press.

Reference Books

- VigneshPrajapati.(2013). *Big Data Analyticswith R and Haoop*. Packet Publishing.
- Tom White.(2012). *HADOOP: The definitive Guide*. O Reilly.

E– Resources

- http://www.bigdatauniversity.com/
- http://www.coreservlets.com/hadoop-tutorial/#Pig-1
- http://in.reuters.com/tools/rss
- http://www.altova.com/xmlspy.html
- https://www.w3.org/RDF/

OPEN SOURCE TECHNOLOGY – PRACTICAL

UCSR607

Semester	**: VI**	**Credit**	**: 3**
Category	**:** Core XX	**Hours/Week**	**: 3**
Class &Major	**: III BSc CS**	**Total Hours**	**: 39**

Objectives:

To enable the students

- Develop an interactive and secured web application
- Reduce the code to build user interface application
- Design web applications for develop software

Learning Outcomes:

On Completion of the course, the students will be able to

- Develop an interactive and secured web application
- Evaluate the code to build user interface application
- Develop the web applications by various user interfaces

Lab Exercise

PHP

1. Creating simple webpage using PHP
2. Use of conditional statements and looping statements in PHP
3. Creating different types of arrays
4. Creating user defined functions
5. File manipulation using PHP
6. Creation of sessions
7. Creation of cookies

MySQL

1. Creating simple table with constraints
2. Insertion, Updation and Deletion of rows in MYSQL tables
3. Demonstration of joining tables
4. Usage of sub queries
5. Usage of aggregate functions
6. Working with string, numeric and date functions

PROJECT

UCSP601

Semester : V **Credits : 5**
Category : Core X **Hours/Week : 5**
Class & Major: III B.Sc Computer Science **Total Hours : 65**

Objectives:

To enable the students

- Acquire knowledge in Computer Science research.
- Develop Software Development and Programming skills.

Learning Outcomes:

On Completion of the course, the students will be able to

- Identify practical problem solving using the laboratory techniques and Computer science behind the set experiment.
- Provide students a hands-on experience of Designing, Performing, and Analyzing results from a Real time applications based project.
- Acquire effective knowledge in experiential learning for the students which plays a key role in bridging the gap between industry and Academia.

Guidelines

- Project is offered for final year B.Sc Computer Science students in Semester VI.
- Project can be done according to area of interest.
- Project should do as group with maximum of three students.
- Project can be Field study, Survey, Mining data, Computer Graphics and Multimedia, Extraction of data components from Computer Science area.
- Evaluation scheme for the project will be Internal 60 and External 40.

Assessment

S. No	Internal		External	
	Component	**Marks**	**Component**	**Marks**
1	Review of the Literature	10	Dissertation	10
2	Area of Research	10	Presentation	20
3	Implementation	10	Viva - voce	10
4	Execution of Results	10		-
5	Result and Discussion	10		-
6	Report preparation	10		-
	Total	**60**		**40**
	Maximum marks	100		

NETWORK SECURITY

UCSO606

Semester	**: VI**	**Credit**	**:4**
Category	**: Major Elective**	**Hours/Week**	**:5**
Class	**: III B.Sc CS**	**Total Hours**	**:65**

Objectives:

To enable the Students

- Understand the Cryptography and Network Security concepts and application.
- Acquire knowledge in various types of Encryption and Decryption mechanism.
- Classify and evaluate computer and security threats and models.

Learning Outcomes:

On Completion of the course, the students will be able to

- Identify some of the factors driving the need for network security
- Identify and classify particular examples of attacks
- Define the terms vulnerability, threat and attack
- Identify physical points of vulnerability in simple networks

UNIT - I INTRODUCTION **13 Hrs**

The concepts of Security- the Need for Security - Security Approaches- Principles of Security- Types of Attacks. Convention Encryption: Conventional Encryption Mode-Steganography- Classical Encryption Techniques - Simplified DES- Block Cipher Principles - The Data Encryption Standard - The Strength of DES - Differential and Linear Cryptanalysis - Block Cipher Design Principles - Block Cipher Modes of operation - Conventional Encryption algorithms.

UNIT - II PUBLIC KEY ENCRYPTION AND HASH FUNCTIONS **12 Hrs**

Public Key Cryptography - Principles of Public Key Cryptosystems - The RSA Algorithm - Key Management - Diffie Hellman Key Exchange - Elliptic Curve Cryptography Message Authentication and Hash Functions Authentication Requirements - Authentication Functions - Message Authentication Codes - Hash Functions - Security of Hash Functions.

UNIT - III HASH AND MAC ALGORITHMS **12 Hrs**

Introduction Nifty things to do with a Hash - MD5 Message Digest Algorithm - Secure Hash Algorithm (SHA-I) - RIPEMD - HMAC - CMAC - Digital Signatures - Authentication Protocols -Digital Signature Standard.

UNIT - IV NETWORK SECURITY APPLICATIONS **15 Hrs**

Authentication Applications - Kerberos - X.509 authentication service - public key Infrastructure (PKI) - Electronic Mail Security - Pretty Good Privacy - S/MIME - IP Security - IP Security Overview - IP Security Architecture - Authentication Header - Encapsulating payload - combining security association - Key Management - Web Security - Web Security Considerations - Secure Socket Layer & Transport Layer Security - Secure Electronic Transaction - Introduction to Wireless security.

UNIT - V INTRUDERS, VIRUSES, WORMS AND CYBER SECURITY 13 Hrs

Intruders - Intrusion detection - password management - Viruses and Related Threats - Distributed Denial of service attacks - Firewall Design Principles - Trusted Systems - virtual private network (VPN). Introduction to Cyber Security – Goals of Cyber Security – Computer Forensics – Steganography – Cyber Crime – Vulnerability Assessment.

Text Books

- William Stallings.(2013).*Cryptography and Network Security*. (6th ed.,). Prentice Hall.
- AtulKahate. (2006).*Cryptography and Network Security*.Tata McGraw-Hills.

Reference Books

- Neal Krawetz.(2007). *Introduction to Network Security*. Thomson Business Press.
- EricMaiwald. (2004). *Information Security Series*. Fundamental of Network security. Dreamtech press.

E– Resource

- http://www.nptel.ac.in/courses/106105031

MOBILE TECHNOLOGIES

UCSO607

Semester	**: VI**	**Credit**	**: 4**
Category	**: Major Elective**	**Hours/Week**	**: 5**
Class	**: II1 B.Sc CS**	**Total Hours**	**: 65**

Objectives:

To enable the Students

- Understand the Wireless communication and its devices.
- Examine Wireless Communication Protocols, and Principles.
- Determine the network infrastructure requirements to support mobile devices.

Learning Outcomes:

On Completion of the course, the students will be able to

- Explain the basic physical and technical settings functioning of mobile technologies.
- Describe the basic principles of mobile technologies.
- Describe the development and implementation of mobile technologies.

UNIT - I INTRODUCTION 12 Hrs

Mobile and Wireless Devices – Simplified Reference Model – Need for Mobile Computing – Wireless Transmission – Multiplexing – Spread Spectrum and cellular systems – Medium Access Control – Comparisons.

UNIT - II TELECOMMUNICATIONS SYSTEM 12 Hrs

Telecommunication System – GSM – Architecture – Sessions – Protocols – Hand over and Security – UMTS and IMT 2000 – Satellite System.

UNIT - III WIRELESS LAN **16 Hrs**

Introduction-Wireless LAN advantages-IEEE 802.11 Standards-Wireless LAN Architecture - Mobility in Wireless LAN-Deploying Wireless LAN-Mobile Ad hoc Networks and Sensor Networks-Wireless LAN Security-Wireless Access in Vehicular Environment-Wireless Local Loop-HiperLAN- Bluetooth – MAC Layer – Security and Link Management.

UNIT - IV MOBILE IP **13Hrs**

Mobile IP: Goals – Packet Delivery – Strategies – Registration – Tunneling and Reverse Tunneling – Adhoc Networks – Routing Strategies.

UNIT-V WIRELESS APPLICATION PROTOCOL **12 Hrs**

Wireless Application Protocol (WAP) – Architecture – XML – WML Script – Applications.

Text Book

- Jochen Schiller. (2003). *Mobile Communication*. 2nd Edition. Pearson Education. Delhi.

Reference Books

- UweHansmann, Lothar Merk, Martin S Nicklons and Thomas Stober.(2003) .*Principles of Mobile Computing*. Springer.
- William Stallings, (2002). *Wireless Communications and Networks*. Pearson Education.
- Kaveh Pahlavan, Prasanth Krishnamoorthy.(2003). *Principles of Wireless Networks*. (1st ed). Pearson Education.
- Sandeep Singhal. *the Wireless Application Protocol: Writing Applications for the Mobile Internet.*

E - Resources

- https://sgar91.files.wordpress.com/2011/10/mobile_communications_schiller_2e.pdf
- http://www.geethanjaliinstitutions.com/engineering/coursefiles/downloads/ece/wcn.pdf

INTERNET OF THINGS

UCSO608

Semester	**: VI**	**Credits**	**: 4**
Category	**: Major Elective**	**Hours/Week :**	**5**
Class &Major	**: III B.Sc CS**	**Total Hours**	**: 65**

Objectives:

To enable the students

- Analyze the concepts of an interactive and secured web application
- Reduce the code to build user interface application
- Design web applications for develop software

Learning Outcomes:

On Completion of the course, the students will be able to

- Understand the concepts of market perspective of IoT.
- Compare and Contrast the use of Devices, Gateways and Data Management in IoT.
- Implement state of the art architecture in IoT.

UNIT - I INTRODUCTION 13 Hrs

Definition – phases – Foundations – Policy– Challenges and Issues - identification - security – privacy. Components in internet of things: Control Units – Sensors – Communication modules – Power Sources – Communication Technologies – RFID – Bluetooth – Zigbee – Wifi – Rflinks – Mobile Internet – Wired Communication.

UNIT - II PROGRAMMING THE MICROCONTROLLER FOR IOT 13 Hrs

Basics of Sensors and actuators – examples and working principles of sensors and actuators – Cloud computing and IOT – Arduino/Equivalent Microcontroller platform – Setting up the board - Programming for IOT – Reading from Sensors.

UNIT – III RFID AND INFORMATION TECHNOLOGY INTEGRATION 13Hrs

What Is RFID? - The Three Core Components of an RFID System - RFID Tags - RFID Interrogators - RFID Controllers - What Is RFID Middleware? - The Recent Focus on Middleware - Core Functions of RFID Middleware - Middleware as Part of an RFID System—The EPC Architecture - The Present State of Middleware Development - Middleware Vendors.

UNIT – IV MACHINE-TO-MACHINE INTERACTIONS 13Hrs

Introduction - Types of IoT interaction - Basic local M2M interactions - Cloud M2M with IFTTT - M2M alarm system - Automated light controller - Automated sprinkler controller - Troubleshooting basic M2M issues

UNIT V CASE STUDIES AND REAL-WORLD APPLICATIONS 13Hrs

Real world design constraints - Applications - Asset management, Industrial automation, smart grid, Commercial building automation, Smart cities - participatory sensing - Data Analytics for IoT – Software & Management Tools for IoT Cloud Storage Models & Communication APIs – Cloud for IoT - Amazon Web Services for IoT.

Text Books

- Charalampos Doukas. (2002). *Building Internet of Things with the Arduino*- Create space-
- V. Daniel Hunt, Albert Puglia, Mike Puglia. (2007). *Rfid-A Guide To Radio Frequency Identification* –Wiley,
- Marco Schwartz. (2016)**.** *Internet of Things with Arduino Cookbook*. Packt Publishing Olivier Hersent, David Boswarthick, Omar Elloumi. (2012).*The Internet of Things–Key applications and Protocols*. Wiley.

References Book

- Luigi Atzor et.al.(2010). *The Internet of Things: A survey*- Journal on Networks-Elsevier Publications.

E-Resources

- http://postscapes.com/
- http://www.theinternetofthings.eu/what-is-the-internet-of-things

ALLIED COURSES OFFERED TO OTHER DEPARTMENTS
BUSINESS ANALYTICS AND INTELLIGENCE

UCSA509

Semester	**: V**	**Credit**	**: 3**
Category	**: Allied**	**Hours/Week**	**: 3**
Class &Major	**: B.COM(CA)**	**Total Hours**	**: 39**

Objectives:

To enable the students

- Understand the concepts of business problems and its solutions.
- Evaluate the processes needed to develop, report, and analyze business data.
- Apply Excel and Excel add-instructions to solve business problems

Learning Outcomes:

On Completion of the course, the students will be able to

- Understand and critically apply the concepts and methods of business analytics
- Identify, model and solve decision problems is different areas
- Implement powering consumer applications and new opportunity for entrepreneurship for analytics

UNIT-I INTRODUCTION **7 Hrs**

Business Intelligence: overview-need for Business Intelligence-information and knowledge-Role of Mathematical models- characteristics of business intelligence -structure and components of business intelligence.

UNIT- II ANALYTICS STRATEGY **8 Hrs**

Business Analytics at the strategic level: Strategy and BA-Link between strategy and Business Analytics-BA supporting strategy at functional level-Functions-information as strategic resource.

UNIT -III DATA VISUALIZATION **8Hrs**

Data visualization-Online Analytical Processing (OLAP)-Reports and Queries -Multidimensionality Advanced Business Analytics.

UNIT -IV DATA MINING **8 Hrs**

Data Mining definition, objetives and benefits Methods-Applications of DM -Data Mining Software Tools-Data Mining Process-Text and Web DM. Business Analytics at

Analytical level : Statistical data mining-descriptive Statistical methods-data mining with target variables.

UNIT-V BUSINESS INTELLIGENCE 8 Hrs

Business Intelligence Architectures: Cycle of Business Intelligence Analysis-Development of Business Intelligence System- spread sheets. BI Tools: Concept of dashboard. BI Applications in different domains- CRM, HR.

Text Book

- Turban, Sharda. (2014). *Decision Support and Business Intelligence Systems.* (4^{th}ed). Delen, Pearson.

Reference Books

- Olivia Parr Rud. (2009). *Business Intelligence Success Factors Tools for aligning your business in the global economy*. John Wiley and Sons.
- Steve Williams and Nancy Williams. (2007). *The Profit impact of Business Intelligence*. Morgan Kauffman Publishers Elsevier.
- Gert H.N. Laursen & Jesper Thorlund. (2010). *Business Analytics for Managers: Taking Business Intelligence beyond reporting*. Wiley and SAS Business Series.

E-Resources

- http://www.w3schools.com/html/
- https://www.tutorialspoint.com/management_information_system/business_intelligence_system.h tm

BUSINESS ANALYTICS AND INTELLIGENCE USING SAS LAB

UCSR512

Semester : V **Credit : 2**
Category : Allied **Hours/Week : 3**
Class &Major: B.Com (CA) **Total Hours : 39**

Objectives:

To enable the students

- Understand the concepts of SAS platform for alter, manage and retrieve data
- Analyze the SAS provides of graphical point-and-click user interface.
- Implement the statistical data for non-technical users

Learning Outcomes:

On Completion of the course, the students will be able to

- Understand the concept of a SAS Enterprise Guide.
- Create the numerical and pictorial summaries of data for Distribution Analysis.
- Develop the various applications for statistical analysis of data.

Lab Exercise

1. Logging on to the SAS platform via SAS Enterprise Guide
2. Creating and saving a project SAS Enterprise Guide
3. Importing an Excel File into SAS.
4. Output Formats.
5. Expression builder to create variable using query.
6. Exploring Output Formats and Setting Default
7. Exploring the Data and Creating a Basic Report
8. Summary statistics.
9. Filtering
10. Graphical Exploration

OBJECT ORIENTED PROGRAMMING USING JAVA

UCSA507

Semester : V	**Credit : 3**
Category : Allied	**Hours/Week : 3**
Class & Major: III B.Sc Maths	**Total Hours : 39**

Objectives:

To enable the students

- Understand the concepts of oops.
- Design and build Java applications
- Overview all the features of the language and its associated Package

Learning Outcomes:

On Completion of the course, the students will be able to

- Understand the use of OOPs concepts.
- Understand the use of Packages and Interface in java.
- Able to develop and understand exception handling, multithreaded applications with synchronization.
- Able to design GUI based applications and develop applets for web applications.

UNIT – I FUNDAMENTALS OF OOPS **7 Hrs**

Fundamentals of OOPS: Basic Concepts – Benefits of OOP – Application of OOP – Java Evolution – Overview of Java – Data types, Variables and Constants - Operators – Control Statements.

UNIT – II CLASSES AND CONSTRUCTORS **8 Hrs**

Introducing Classes, Objects and Methods: Defining class – Creating Objects – Accessing Class Members – Constructors – Method overloading – Static Members – Inheritance

UNIT – III INTERFACES AND PACKAGES **9 Hrs**

Interfaces: Defining Interfaces – Extending Interfaces –Implementing Interfaces - Package: Java API Package - Naming Conventions – Creating & Accessing a Package – using a Package - Adding a class to a Package – Hiding Classes – Multithreaded Programming: Life cycle of a Thread – Managing Errors and Exceptions.

UNIT – IV APPLET **8 Hrs**

Applet: Introduction – How Applets Differ from Applications – Building Applet Code – Applet Life Cycle – Applet Tag – Adding Applet to HTML File – Running the Applet – Graphics Programming.

UNIT – V FILES IN JAVA **7 Hrs**

Managing Input and output files in Java: stream classes - Byte Stream classes –Character stream classes - I/O Exceptions – Creation of Files - Random Access Files – Other Stream Classes.

Text Book

- Balagurusamy, E.(2010). *Java Programming*. (2^{nd}ed). Tata McGraw Hill. New Delhi.

Reference Book

- Cay. S. Horst Mann & Gary Cornell. (2006). *Core java, Volume I.* (7^{th} ed.,). Sun Microsystem Press Java Series. New Delhi.

OBJECT ORIENTED PROGRAMMING USING JAVA –LAB

UCSR508

Semester : V	**Credit : 2**
Category : Allied Practical	**Hours/Week : 3**
Class & Major: III B.Sc Maths	**Total Hour : 39**

Objectives:

To enable the students

- Write Java code in the form of both applications and applets.
- Implement Exception and threads
- Creating files using I/O Packages

Learning Outcomes:

On Completion of the course, the students will be able to

- Able to solve real world problems using OOP techniques.
- Able to understand the use of abstraction.

- Able to understand the use of Packages and Interface in java.
- Develop applets for web applications.

LAB EXERCISES

1. Random Number Generation using predefined Random class.
2. Implement Mathematical function using predefined math package.
3. Implementing string manipulation using string and string buffer classes
4. Simple programs using Classes and Objects
5. Implementing Inheritance concepts with simple programs.
6. Implementing Thread Based Applications
7. Implementing Exception Handling.
8. Implementing Interfaces and Packages Concepts.
9. Implementing Graphics using Applet.
10. Sequential File Manipulations.

III and IV Evaluation Components of CIA

Semester	Part	Category	Course Code	Course Title	Component III	Component IV
V	III	Core IX	UCSM506	Middleware Technologies	Assignment	Seminar
	III	Core XIII	UCSM509	Database Systems	Query writing	ER Diagram
	III	Core XIV	UCSM510	Computer Networks	Assignment	Seminar
	III	Core XV	UCSM511	Software Engineering	Project Designing	Seminar
	III	Core Practical VII	UCSR509	Middleware Technologies – Practical	DPA	Viva Voce
	III	Core XVII	UCSR511	Database Systems-Practical	DPA	Viva-voce
VI `	III	Core XVIII	UCSM612	Cloud Computing	Assignment	Seminar
	III	Core XIX	UCSM613	Open Source Technology	App Development	Seminar
	III	Core XIV	UCSM610	Big Data Tools	Assignment	Seminar
	III	Core XXI	UCSR607	Open Source Technology-Practical	DPA	Viva-voce

ALLIED COURSES OFFERED TO OTHER DEPARTMENTS

Semester	Part	Category	Course Code	Course Title	Component III	Component IV
V	III	Allied	UCSA509	Business Analytics and Intelligence.	Assignment	Seminar
	III	Allied Practical	UCSR512	Business Analytics and Intelligence using SAS - Lab	DPA	Viva-voce
	V	Allied	UCSA507	Object Oriented Programming using Java	Program Writing	Assignment
	V	Allied Practical	UCSR508	Object Oriented Programming using Java - Lab	DPA	Viva-voce

COURSE PROFILE M.Phil (Computer Science)

PROGRAMME SPECIFIC OUTCOMES (PSO)

Upon Completion of the Programme, the Students will able to

- Ability to analyze and apply the latest technologies in the concepts of key areas in computer science.
- Critical analysisof problems and thorough evaluation of potential benefits of alternative solution in designing software and/or hardware systems.
- Ability to analyze and synthesize computing systems through quantitative and qualitative techniques.
- Ability to use knowledge in various domains to identify research gaps and provide solution to new ideas and innovations.

Semester	Category	Course Code	Course Title	Contact Hrs/Week	Credit Min/Max
I	Core Paper I	MCSM108	Research Methodology	6	5
	Core Paper II	MCSM109	Advanced Topics in Computer Science	6	5
	Core Paper III	MCSM107	Special Area Study	6	5
	Elective	MRPE101	Research publication and ethics	2	2
II	Core Paper IV	MCSD201	Dissertation &Viva-voce	30	13

DEPARTMENT OF COMPUTER APPLICATIONS

PREAMBLE

UG **:** Programme profile and the syllabi of courses in the V & VI semesters along with evaluation components III & IV (with effect from 2018-2021 batch onwards)

PROGRAMME PROFILE: BCA

PROGRAMME SPECIFIC OUTCOMES (PSO)

Upon Completion of the Programme, the Students will able to

- Understanding of the key concepts and principles of programming languages.
- Capacity to analyze a problem, identify the computing requirements and using procedures find a solution.
- Development of practical skills to solve problems and provide solutions using current trends in the discipline of Computer Applications.
- 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	UTAL105/ UTAL106/ UHIL101/ UFRL101	Basic Tamil-I/ Advanced Tamil-I/ Hindi-I/ French-I	-	4	2/3
	II	English	UENL107/ UENL108	General English-I/ Advanced English-I	-	5	3/4
	III	Core I	UCAM107/ UCSM106	Programming in C	UCAM105	6	5
	III	Core II	UCAM108/ UCSM108 UCAM109/ UCSM109	Fundamental of Computer Science/ Advanced Computer Science	UCAM106	5	4
	III	Core Practical I	UCAR105/ UCSR108	Programming in C- Practical	UCAR104	3	2
	III	Allied I	UMAA110	Mathematical Methods-I	-	5	4
	IV	Value Education				2	1
					Total	**30**	**21/23**
II	I	Language	UTAL205/ UTAL206/ UHIL201/ UFRL201	Basic Tamil-II/ Advanced Tamil-II/ Hindi-II/ French-II	-	4	2/3
	II	English	UENL207/ UENL208	General English-II/ Advanced English-II	-	5	3/4
	III	Core III	UCAM205/ UCSM206	Data Structures	UCAM204	6	6
	III	Core Practical II	UCAR204/ UCSR205	Data Structures - Practical	UCAR203	4	3
	III	Allied II	UMAA216	Mathematical Methods-II	-	5	4

	IV	Non - Major Elective				4	2
	IV	Soft Skill				2	1
	V	Extension Programme/ Physical Education/NCC				-	1
					Total	**30**	**22/25**
III	III	Core IV	UCAM310/ UCSM305	Java Programming	UCAM307	5	5
	III	Core V	UCAM308	MIS and ERP	-	5	4
	III	Core VI	UCAM311	Data Communication Networks	UCAM309/ UCAM405	6	5
	III	Core Practical III	UCAR304/ UCSR308	Java Programming - Practical	UCAR303	4	3
	III	Allied III	UCOA303	Financial Accounting	-	5	5
	IV	Online course		NPTEL/Spoken Tutorial/Swayam	-	3	1/2
	IV	Value Education				2	1
					Total	**30**	**24/25**
IV	III	Core VII	UCAM404	Database Management System	-	6	5
	III	Core VIII	UCAM403	Object Oriented Analysis and Design	-	5	4
	III	Core IX	UCAM407	Python Programming	UCAM406	6	5
	III	Core Practical IV	UCAR402	Database Management System - Practical	-	3	2
	III	Core Practical V	UCAR404	Python Programming- Practical	UCAR403	3	2
	III	Allied IV	UCOA403/ UCOR403	Accounting Package	-	5	5
	IV	Soft skill				2	1
	V	Extension Programme/ Physical Education				-	2
					Total	**30**	**24/26**
V	III	Core X	UCAM507	Operating System	UCAM506/ UCAM606	5	5
	III	Core XI	UCAM509	Software Engineering	UCAM504	5	4
	III	Core XII	UCAM505	Web Programming	-	6	5
	III	Core XIII	UCAM508	Open Source Technology	UCAM501	6	5
	III	Core Practical VI	UCAR506	Open Source Technology - Practical	UCAR504	3	2
	III	Core Practical VII	UCAR505	Web Programming - Practical	-	3	2
	IV	Value Education				2	1
					Total	**30**	**24**
VI	III	Core XIV	UCAM609	Data Mining	UCAM606	5	4
	III	Core XV	UCAM610	Computer Graphics	UCAM607	5	4
	III	Core XVI	UCAM611	Basics of IOT	UCAM608	4	3
	III	Core Practical VII	UCAR602	Data Mining - Practical	UCAR602	4	3

	III	Core Project	UCAP601	Project		5	5
	III	Major-Elective	UCAO606/ UCAO604	Fundamentals of Security/ Cloud Computing	UCAO605	5	4
	III	Viva-Voce	UCAM601	Comprehensive Viva Voce	-	-	1
	IV	Soft Skill				2	1
	V	Extension Programme/ Physical Education/NCC				-	2
					Total	**30**	**25/27**
					Grand Total	**180**	**140/150**

NON-MAJOR ELECTIVE

Semester	Part	Category	Course Code	Course Title	Previous Course Code	Contact Hrs/week	Credit
II	IV	Non Major Elective	UCAE207	Data Science Using R	-	4P	2
			UCAE208	Cyber Forensics	-	4T	2
			UCAE209	PyMOL	-	4P	2
			UCAE210	Qlik View	-	4P	2

EXTRA CREDIT EARNING PROVISION

Semester	Part	Category	Course Code	Course Title	Contact/ Week	Credit	
II	III	Summer Internship	UCAI201	Summer Internship	-	-	1
IV	III	Summer Internship	UCAI401	Summer Internship	-	-	1
V	III	Self Study	UCSS501/ UCAS501	Python Programming	2	1	1
V	III	Self Study	UCSS502/ UCAS502	Android Applications	2	1	1
VI	III	Self Study	UCSS601/ UCAS601	Angular JS	2	1	1
VI	III	Self Study	UCSS602/ UCAS602	Green Computing	2	1	1

Inclusion of Experiential Learning

A. Experiential Learning (Mandatory)

Course Mapping				Collaborating Agency - MSME		
Sem	Course Code	Course Title	Assessment	Course Title	Hours/ Days / Month	Mode of Evaluation
II	UCAM310	Java Programming	Component III	Java Programming	4 Days	Reflection
II	UCAM407	Python Programming	Component III	Python Programming	4 Days	Reflection

				Training		
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

Sem	Category	Course Code	Course Title	Collaborating Agency	Hours/ Days/Month	Mode of Evaluation	Credits (Min/Max)
V	Core	UCAT501	Excel Analytics with R-Language	**MSME**	4 Days	Reflection	1

OPERATING SYSTEM

UCAM507

Semester : V **Credits : 5**
Category : Core X **Hours/Week : 5**
Class & Major : III BCA **Total Hours : 65**

Objectives

To enable the students

- Acquire knowledge on basics of operating system.
- Analyze the various scheduling algorithms in process and memory management.
- Exposure to Linux Operating System.

Learning Outcomes

On Completion of the course, the students will be able to

- Describe the important computer system resources and the role of operating system in their management policies and algorithms.
- Understand the process management policies and scheduling of processes by CPU
- Evaluate the requirement for process synchronization and coordination handled by operating system

UNIT – I OVERVIEW OF OPERATING SYSTEM **13 Hrs**

Operating system – Types of Computer Systems Computer-System operation – I/O structure – System components – System calls – System programs – Process concept – Process scheduling – Operations on processes –Inter process communication – Multithreading models – Threading issues.

UNIT – II PROCESS MANAGEMENT **13 Hrs**

Scheduling criteria – Scheduling algorithms – Multiple-processor scheduling – Real time scheduling – Algorithm Evaluation – Process Scheduling Models - Synchronization hardware – Semaphores – Classic problems of synchronization – Deadlock characterization – Methods for handling deadlocks – Recovery from deadlock.

UNIT – III MEMORY MANAGEMENT **13 Hrs**

Swapping – Contiguous memory allocation – Paging – Segmentation – Segmentation with paging. Virtual Memory: Background – Demand paging – Process creation – Page replacement – Allocation of frames – Thrashing.

UNIT – IV FILE CONCEPT **13 Hrs**

Access methods – Directory structure – File-System Mounting – Protection – Directory implementation – Allocation methods – Free-space management – Disk scheduling – Disk management – Swap-space management.

UNIT – V THE LINUX SYSTEM **13 Hrs**

History – Design Principles – Kernel Modules – Process Management – Scheduling – Memory management – File systems – Input and Output – Inter-process Communication – Security.

Text Books

- Silberschatz, Galvin and Gagne. (2013). *Operating System Concepts*. John Wiley & Sons Inc. (8^{th} ed.,) .New Delhi.
- Richard Fox. (2014). *Linux with Operating System Concepts.* Pearson Education.(2^{nd} ed.,).

Reference Books

- Andrew, S. Tanenbaum. (2013).*Operating system Design and Implementation. (*4 the ed.,) PHI. New Delhi.
- Deital, H.M. Deital,P.J and Choffnes, D.R.(2013).*Operating Systems*. Pearson Education. New Delhi.

E-Resources

- http://www.w3schools.com
- http://www.youtube.com

SOFTWARE ENGINEERING

UCAM509

Semester : V **Credits : 4**
Category : Core XI **Hours/Week: 5**
Class & Major: III BCA **Total Hours : 65**

Objectives

To enable the students

- Introduce the basic concepts of Software Engineering and the various phases in Software development
- Understand User Conceptual Models and Interface Design.
- Specification of participatory design & interactive debugging.

Learning Outcomes

On Completion of the course, the students will be able to

- Define various software application domains and remember different process model
- Explain needs for software specifications also they can classify different types of software requirements and their gathering techniques.
- Convert the requirements model into the design model and demonstrate use of software and user interface design principles.

UNIT-I INTRODUCTION **13 Hrs**

Introduction to Software Engineering –Software –The changing nature of the software. A Generic view of Process: Software Engineering Layered Technology –A Process Framework – Personal & Team Process Models. Process Models: Waterfall –Incremental –Evolutionary – Specialized process models –Agile Process Models.

UNIT-II REQUIREMENT ENGINEERING **13 Hrs**

Requirement Engineering: Requirement engineering task-Eliciting requirements – Building Analysis Model –Data Modeling Concepts-Flow oriented modeling–Class Based Modeling. Design Engineering: –Design Concepts –Design Models –Data design-Architectural Design.

UNIT-III USER INTERFACE DESIGN **13 Hrs**

Modeling Component Level Design: –Component –Designing Class-Based Components –Conducting Component-Level Design. Performing User Interface Design: Golden Rules –User Interface Analysis & Design –Interface Design Steps –Design Evaluation.

UNIT-IV TESTING STRATEGIC **13 Hrs**

Testing Strategies –A Strategic Approach to Software Testing –Strategic Issues –Test Strategies for Conventional & Object Oriented Software –Validation Testing –System Testing – The Art of Debugging Testing Tactics –Software Testing Fundamentals –Black Box and White Box Testing –Basis Path Testing –Control Structure Testing.

UNIT-V LEVELS OF TESTING **13 Hrs**

The Need for Levels of Testing – Unit Test – Unit Test Planning –Designing the Unit Tests – Integration tests – Designing Integration Tests – Integration Test Planning – Scenario testing – System Testing –Types of system testing -Acceptance testing –Performance tests - Regression Testing –Internationalization testing –Ad-hoc testing -Alpha –Beta Tests –Testing OO systems –Usability and accessibility is testing.

Text Book

- Roger, S. Pressman, (2005).*A Practitioner's Approach Software Engineering*. (6th ed.,). McGraw Hill International Edition.

Reference Books

- Sommerville, I. (1983). *Software Engineering*. (5th ed.,) Addison Wesley. McGraw Hill.
- David Gustafson. (2003). *Software Engineering.* Schaum's outlines. Tata McGraw –Hill.
- Waman, S. Jawadekar. (2004). *Software Engineering: Principles and Practice.* McGraw Hill.

E-Resources

- http://www.w3schools.com
- http://www.youtube.com

WEB PROGRAMMING

UCAM505

Semester : V **Credit : 5**
Category : Core XII **Hours / Week : 6**
Class & Major: III BCA **Total Hours : 78**

Objectives:
To enable the students

- Understand the concepts of web programming languages.
- Analyze the various controls for designing web applications.
- Develop the web applications using .Net Technologies.

UNIT - I HTML AND JAVASCRIPT **16 Hrs**

World Wide Web – XHTML - Cascading style sheet- JavaScript – Date – Array - Pattern matching using regular expressions - Dynamic documents with java script.

UNIT - II .NET FRAMEWORK AND APPLICATION STRUCTURE **16 Hrs**

Introduction to .NET - Benefits of .NET Framework - Structure of an Application - The Application Domain - The Application Lifetime - The Application Directory Structure - The Global. asax Application File - Using States - HTTP Handlers - Postback and Cross-Page Posting.

UNIT - III WEB STANDARD CONTROLS **16 Hrs**

The Control Class - The Web Control Class - Label - Button – Text Box - Literal – Place Holder – Hidden Field – File Upload - Image – Image Button – Image Map – List Box – Drop Down List – Bulleted List – Hyper Link – Link Button – Check Box – Check Box List – Radio Button – Radio Button List – Table – Panel – Wizard - Xml – View – Multi View – Substitution – Localize – Calendar – AdRotator.

UNIT - IV OTHER WEB CONTROLS **15 Hrs**

Navigation Controls: Tree View – Menu – Site Map Path - Validation Controls: Base Validator – Field Validator- Range Validator – Regular Expression Validator – Compare Validator – Custom Validator – Validation Summary.

UNIT - V DATABASE CONTROLS **15 Hrs**

Working with Database Controls: Grid View - DataList - Details View - Form View – List View- Repeater – Data Pager – Chart – Query Extender –SqlDataSource – Access DataSource - LinqDataSource – Object DataSource – Xml DataSource – Entity DataSource – SiteMapDataSource.

Text Books

- Bayross,I. (2010).*Web enabled commercial Application Development using HTML.DHTML. Javascript*. Perl CGI. BPB Publications. New Delhi.
- Kogent Learning Solutions Inc. (2012). *ASP.NET 4.0 Black Book.* Dream tech Press publications.

Reference Book

- Kogent Learning Solutions Inc. (2011*).NET 4.0 programming (6-in-1) Black Book.* Dreamtech Press publications.

E-Resources

- http://www.w3schools.com
- http://www.youtube.com

OPEN SOURCE TECHNOLOGY

UCAM508

Semester :V **Credit : 5**

Category : Core XIII **Hours/Week : 6**

Class & Major : III BCA **Total Hours : 78**

Objectives

To enable the students

- Understand the concept of Asynchronous Calls to Web server
- Manipulate WebPages in an efficient manner
- Develop website with dynamic changes

Learning Outcomes

On Completion of the course, the students will be able to

- To provide a basic idea of open source technology and their software development process
- To understand the role and future of open source software
- Develop web page with dynamic changes

UNIT – I INTRODUCTION **15 Hrs**

Introduction- Open source-PHP – History – features – Variables – Statements – Operators Conditional statements – if – switch – Nesting conditions – Merging forms with conditional statements – Loops –while – do – for – Loop iteration with break and continue.

UNIT – II ARRAYS AND FUNCTIONS **15 Hrs**

Arrays: Creating an array – Modifying array – Processing array – Grouping form with arrays – Using array functions – Creating user defined functions – Using files – Sessions – Cookies – Executing external programs – Creating sample applications using PHP.

UNIT – III MYSQL **16 Hrs**

Effectiveness of MySQL – MySQL Tools – Prerequisites for MySQL connection – Databases and tables – MySQL data types – Creating and manipulating tables – Insertion, updation and deletion of rows in tables – Retrieving data – Sorting and filtering retrieved data – Advanced data filtering – Data manipulation functions – Aggregate functions – Grouping data – Sub queries – Joining Tables – Set operators – Full text searching.

UNIT – IV PHP WITH MYSQL **15 Hrs**

Working MySQL with PHP – database connectivity – usage of MYSQL commands in PHP, processing result sets of queries – handling errors – debugging and diagnostic functions – validating user input through Database layer and Application layer – formatting query output with Character, Numeric, Date and time – sample database applications.

UNIT – V JQUERY USER INTERFACE **17 Hrs**

Intro to jQuery UI – Need of jQuery UI in real web sites – Downloading and Importing jQuery UI – Draggable – Droppable – Resizable – Selectable – Sortable – Accordion – Auto Complete – Date Picker – Dialog – Menu – Progress Bar – Slider – Spinner – Tabs – Tooltip – Color Animation – Easing Effects – addClass – remove Class – Effects – jQuery UI themes – Customizing jQuery UI widgets / plug-ins – jQuery UI with CDN – Consuming jQuery Plug-– Regular expressions.

Text Books

- VikramVaswani . (2005). *PHP and My SQL*.Tata McGraw-Hill.
- Ben Forta. (2006). *MySQL Crash course* .SAMS.
- Dan Wellman. (2008). *J Query UI 1.8: The User Interface Library for J Query*. Packt Publishing. Brimingham–Mumbai.
- Rebecca Murphey. (2009). *J Query Fundamentals.*Superhero Labs Publisher.(1st ed.,).

Reference Books

- Tim Converse, Joyce Park and Clark Morgan. (2008). *PHP 5 and MySQL*. Wiley India reprint.
- Robert Sheldon, Geoff Moes. (2005).*Beginning MySQL*.Wrox.

E-Resources

- http://www.w3schools.com
- http://www.youtube.com
- https://www.techopedia.com

OPEN SOURCE TECHNOLOGY – PRACTICAL

UCAR506

Semester	**: V**	**Credit**	**: 2**
Category	**: Core Practical VI**	**Hours/Week**	**: 3**
Class & Major	**: III BCA**	**Total Hours**	**: 39**

Objectives

To enable the students

- Develop an interactive and secured web application
- Reduce the code to build user interface application

Learning Outcomes

On Completion of the course, the students will be able to

- Develop an interactive and secured web application
- Reduce the code to build user interface application
- Ability to develop applications

Lab Exercise

PHP

1. Creating simple webpage using PHP
2. Use of conditional statements and looping statements in PHP
3. Creating different types of arrays
4. Creating user defined functions
5. File manipulation using PHP
6. Creation of sessions
7. Creation of cookies

MySQL

1. Creating simple table with constraints
2. Insertion, Updation and Deletion of rows in MYSQL tables
3. Demonstration of joining tables
4. Usage of subqueries
5. Usage of aggregate functions
6. Working with string, numeric and date functions

WEB PROGRAMMING – PRACTICAL

UCAR505

Semester	**: V**	**Credits**	**: 2**
Category	**: Core Practical VII**	**Hours/Week**	**: 3**
Class & Major	**: III BCA**	**Total Hours**	**: 39**

Objectives:
To enable the students

- Understand the real time requirements of web based programs.
- Explore the functionalities of web tools.
- Develop the client-server architecture.

Lab Exercises:

1. Create a Calculator program using JavaScript.
2. Create a web page using Image map and calendar control.
3. Create a web page using File Upload, Hyperlink and Link button.
4. Creating and Using a Simple User Control.
5. ADO.NET application to insert, delete, update records in database.
6. Create a simple web page using all validation controls.
7. Create a web page using AdRotator & menus.
8. Create a web page using grid view, form view, detail view and list view.
9. Data List and Repeater control.
10. Create a web page to manage the session.

DATA MINING

UCAM609

Semester	**: VI**	**Credit**	**: 4**
Category	**: Core XIV**	**Hours/Week**	**: 5**
Class & Major	**: III BCA**	**Total Hours**	**: 65**

Objectives

To enable the students

- Understand the Data Preprocessing Techniques.
- Analyse the various algorithms in Data Mining.
- Extract the data using classification and cluster algorithms in the research field.

Learning Outcomes

On Completion of the course, the students will be able to

- Organize and Prepare the data needed for data mining using pre preprocessing techniques
- Define and apply metrics to measure the performance of various data mining algorithms.
- Implement the appropriate data mining methods like classification, clustering or Frequent Pattern mining on large data sets.

UNIT – I INTRODUCTION **13 Hrs**

Data Mining tasks – Data Mining versus Knowledge Discovery in Data bases – Relational databases – Data warehouses – Transactional databases – Object oriented databases – Spatial databases – Temporal databases – Text and Multimedia databases – Heterogeneous databases - Mining Issues.

UNIT - II DATA PREPROCESSING **13 Hrs**

Data Preprocessing – Data cleaning – Data Integration – Data Transformation – Data Reduction – Data Discretization.

UNIT - III DATA MINING TECHNIQUES **13 Hrs**

Association Rule Mining – The Apriori Algorithm – Multilevel Association Rules – Multidimensional Association Rules – Constraint Based Association Mining.

UNIT - IV CLASSIFICATION AND PREDICTION **13 Hrs**

Classification and Prediction – Issues– Decision Tree induction – Bayesian Classification – Back Propagation – Classification Methods – Prediction – Classifiers accuracy.

UNIT - V CLUSTERING TECHNIQUES **13 Hrs**

Cluster Analysis – Clustering Methods – Hierarchical Methods – Density Based Methods – Outlier Analysis – Introduction to Advanced Topics: Web Mining, Spatial Mining and Temporal Mining.

Text Book

- Jiawei Han and Micheline Kamber. (2012). *Data Mining Concepts and Techniques*. Elsevier. (3rd ed.,) .

Reference Books

- Alex Berson and Stephen J.Smith. (2016). *Data Warehousing, Data Mining & OLAP*. Tata McGraw Hill Edition. 35th Reprint.
- Ian Witten Eibe Frank Mark Hall. (2011). *Data Mining. Practical Machine Learning Tools and Techniques*. (3rd ed.,).

E-Resources

- https://www.microstrategy.com
- https://www.techopedia.com

COMPUTER GRAPHICS

UCAM610

Semester	**: VI**	**Credits**	**: 4**
Category	**: Core XV**	**Hours/Week**	**: 4**
Class & Major:	**III BCA**	**Total Hours**	**: 52**

Objectives:

To enable the students

- Acquire Knowledge on two and three dimensional graphical structures.
- Analyze the Multimedia compression and animations.
- Design 2D and 3D objects for animation.

Learning Outcomes

On Completion of the course, the students will be able to

- To implement various algorithms to scan, convert the basic geometrical primitives, transformations, Area filling, clipping.
- To describe the importance of viewing and projections.
- To define the fundamentals of animation, virtual reality and its.

UNIT – I 2D PRIMITIVES **10 Hrs**

A survey of Computer Graphics – Overview of Graphic systems – Elements of pictures created in computer graphics – Graphics input primitives and devices Drawing primitives in open GL and Basic open GL programming – open GL basic Graphics primitives – Output primitives – Line, Circle and Ellipse drawing algorithms – Attributes of output primitives.

UNIT – II 2D GEOMETRIC TRANSFORMATIONS **10 Hrs**

2D Viewing – Window-Viewport Transformation – Two dimensional Geometric transformations – Line, Polygon, Curve and Text clipping algorithms.

UNIT – III 3D CONCEPTS **12 Hrs**

Projections – Three dimensional object representation – Parallel and Perspective Polygons, 69 Splines, Quadric Surfaces – Visualization of data sets – 3D affine transformations 3D Rotations using Quaternions – Viewing – Visible surface identification – Color Models, 3D Transformations in open GL.

UNIT – IV VISIBLE SURFACE DETECTION METHODS **10 Hrs**

Visible surface detection methods: Classification, back-face detection, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods. depth-buffer,

UNIT – V COMPUTER ANIMATION **10 Hrs**

Flash Simple Programs: key frame systems, motion ,Frame–By-Frame Animation–Motion Tweening – Shape Tweening – Text Animation – 3D Animation.

Text Books

- Donald Hearn,D. Pauline Baker and Warren Carithers. (2010).*Computer Graphics with OpenGL*. Pearson Education. (4^{th}ed.,).
- Foley, VanDam, Feiner and Hughes.(2009). *Computer Graphics Principles & practice*. Pearson Education. (2^{nd} ed.,).

Reference Book

- F.S.Hill,(2010). *Computer Graphics using OPENGL*. Pearson Education. (2^{nd} ed.,).

E-Resources

- http://www.w3schools.com
- http://www.youtube.com
- http://www.nptel.ac.in /courses/106106090
- http://www.nptel.ac.in /courses/106102063

BASICS OF IOT

UCAM611

Semester : VI **Credits : 3**
Category : Core XVI **Hours/Week : 4**
Class & Major : III BCA **Total Hours : 52**

Objectives
To enable the students

- Understand the basic issues, policy and challenges in the Internet.
- Examine the components and the protocols in Internet.
- Build a small low cost embedded system with the Internet

Learning Outcomes
On Completion of the course, the students will be able to

- Interpret the vision of IOT from a global context.
- Determine the Market perspective of IOT.
- Compare and Contrast the use of Devices, Gateways and Data Management in IOT

UNIT - I INTRODUCTION **10 Hrs**

Definition – phases – Foundations – Policy– Challenges and Issues - identification - security –privacy. Components in internet of things: Control Units – Sensors – Communication modules – Power Sources – Communication Technologies – RFID – Bluetooth – Zigbee – Wifi – R flinks – Mobile Internet – Wired Communication.

UNIT - II PROGRAMMING THE MICROCONTROLLER FOR IOT **10 Hrs**

Basics of Sensors and actuators – examples and working principles of sensors and actuators – Cloud computing and IOT – Arduino/Equivalent Microcontroller platform – Setting up the board - Programming for IOT – Reading from Sensors.

UNIT – III RFID AND INFORMATION TECHNOLOGY INTEGRATION **12 Hrs**

What Is RFID? - The Three Core Components of an RFID System - RFID Tags - RFID Interrogators - RFID Controllers - What Is RFID Middleware? - The Recent Focus on Middleware - Core Functions of RFID Middleware - Middleware as Part of an RFID System—The EPC Architecture - The Present State of Middleware Development - Middleware Vendors.

UNIT – IV MACHINE-TO-MACHINE INTERACTIONS **10 Hrs**

Introduction - Types of IoT interaction - Basic local M2M interactions - Cloud M2M with IFTTT - M2M alarm system - Automated light controller - Automated sprinkler controller - Troubleshooting basic M2M issues

UNIT V CASE STUDIES AND REAL-WORLD APPLICATIONS10Hrs Real World Applications : - Asset management-Industrial automation- smart grid,

Commercial building automation - Smart cities - participatory sensing - Data Analytics for IoT – Software & Management Tools for IoT Cloud Storage Models & Communication APIs – Cloud for IoT - Amazon Web Services for IoT-Simple Programs using sensors.

Text Books

- Charalampos Doukas. (2002). *Building Internet of Things with the Arduino*. Create space.
- V. Daniel Hunt. (2007). Albert Puglia, Mike Puglia - *Rfid-A Guide To Radio Frequency Identification*. Wiley.
- Marco Schwartz. (2016). *Internet of Things with Arduino Cook book*. Packt Publishing.
- Olivier Hersent, David Boswarthick, Omar Elloumi. (2012). *The Internet of Things– Key applications and Protocols*.Wiley.

References Book

- Luigi Atzor et.al. (2010).*The Internet of Things: A survey Journal on Networks*. Elsevier Publications.

E-Resources

- http://postscapes.com/
- http://www.theinternetofthings.eu/what-is-the-internet-of-things

DATA MINING –PRACTICAL

UCAR602

Semester :VI	**Credits : 3**
Category : Core Practical VIII	**Hours/Week : 4**
Class &Major :III BCA	**Total/Hours : 52**

Objectives

To enable the students

- Understand the concepts in Data mining.
- Apply programming skills in Weka tool.
- Analyze the dataset.

Learning Outcomes

On Completion of the course, the students will be able to

- The data mining process and important issues around data cleaning, pre-processing and integration.
- The principle algorithms and techniques used in data mining, such as clustering, association mining, classification and prediction.

LIST OF PROGRAMS

Create a Dataset with 'n' number of tuples for the following

1. Student Details
2. Super Market Details
3. Library Details
4. Employee Details
6. Customer Details
7. Recruitment Details
8. Patient Details
9. Weather Details
10. Social Networking Reviews Details

To implement the Dataset in WekaTool

1.Pre-Processing on Dataset

2.Normalize Table data using Knowledge Flow.

3.Association Rule Process on Dataset

- A Priori Algorithm

4.Construct Decision Tree process on Dataset

- ID3 Agorithm
- Naïve Bayes Algorithm

5.Cross-validation process on Dataset

- J 48 Algorithm

6.Clustering Rule process of Dataset

- Simple K-eans Algorithm.

7.Data Visualization

FUNDAMENTALS OF SECURITY

UCAO606

Semester : VI **Credit : 4**
Category : Major Elective **Hours/Week : 5**
Class & Major : III BCA **Total Hours : 65**

Objectives

To enable the students

- Understand the Cryptography and Network Security concepts and application.
- Acquire knowledge in various types of Encryption and Decryption mechanism.
- Classify and evaluate computer and security threats and models.

Learning Outcomes

On Completion of the course, the students will be able to

- Understand the Cryptography and Network Security concepts and application.
- Acquire knowledge in various types of Encryption and Decryption mechanism.
- Classify and evaluate computer and security threats and models.

UNIT – I NETWORK SECURITY **13 Hrs**

The concepts of Security- the Need for Security - Security Approaches- Principles of Security Types of Attacks. Convention Encryption: Conventional Encryption Mode- Steganography- Classical Encryption Techniques - Simplified DES- Block Cipher Principles - The Data Encryption Standard - The Strength of DES - Differential and Linear Crypt analysis - Block Cipher Design Principles - Block Cipher Modes of operation - Conventional Encryption algorithms.

UNIT – II CYBER SECURITY **12 Hrs**

Overview of Cyber Security, Introduction to Cyber Security – Goals of Cyber Security – Computer Forensics – Steganography – Cyber Crime – Vulnerability Assessment. Internet Governance – Challenges and Constraints, Cyber Threats:- Cyber Warfare-Cyber Crime-Cyber terrorism-Cyber Espionage, Need for a Comprehensive Cyber Security Policy, Need for a Nodal Authority, Need for an International convention on Cyberspace.

UNIT – III INFORMATION SECURITY **12 Hrs**

The Security Problem in Computing: The meaning of computer Security, Computer Criminals, Methods of Defense, Elementary Cryptography: Substitution Ciphers, Transpositions, Making "Good" Encryption algorithms, The Data Encryption Standard, The AES Encryption Algorithms, Public Key Encryptions, Uses of Encryption.

UNIT - IV DEVELOPING APPLICATIONS **15 Hrs**

Authentication Applications - Kerberos - x509 authentication service - public key Infrastructure (PKI) - Electronic Mail Security - Pretty Good Privacy - S/MIME - IP Security - IP Security Overview - IP Security Architecture - Authentication Header - Encapsulating

payload - combining security association - Key Management - Web Security - Web Security Considerations - Secure Socket Layer & Transport Layer Security - Secure Electronic Transaction - Introduction to Wireless security.

UNIT - V INTRUDERS, VIRUSES, WORMS **13 Hrs**

Intruders - Intrusion detection - password management - Viruses and Related Threats - Distributed Denial of service attacks - Firewall Design Principles - Trusted Systems - virtual private network (VPN).

Text Books

- William Stallings. (2013). *Cryptography and Network Security*. Prentice Hall .(6^{th} ed.,).
- AtulKahate. (2013).*Cryptography and Network Security*.Tata McGraw-Hills.

Reference Books

- Neal Krawetz. (2007). *Introduction to Network Security*. Thomson Business Press.
- Eric Maiwald. (2004). *Information Security Series. Fundamental of Network security*. Dreamtech press.

E– Resources

- http://www.nptel.ac.in
- https://www.csoonline.com

CLOUD COMPUTING

UCAO604

Semester	**: VI**	**Credits**	**: 4**
Class & Major	**: III BCA**	**Hours/week**	**: 5**
Category	**: Major Elective**	**Total Hours**	**: 65**

Objectives

To enable the students

- Understand the evolution of cloud computing and its services.
- Design and development of simple cloud service.
- Apply the applications of cloud computing in various services.

UNIT – I INTRODUCTION **12 Hrs**–

Cloud-definition, benefits, usage scenarios, History of Cloud Computing Cloud Architecture - Types of Clouds - Business models around Clouds – Major Players in Cloud Computing - issues in Clouds - Eucalyptus - Nimbus - Open Nebula, CloudSim.

UNIT – II CLOUD SERVICES **13 Hrs**

Types of Cloud services: Software as a Service - Platform as a Service – Infrastructure as a Service - Database as a Service - Monitoring as a Service – Communication as services. Service providers- Google, Amazon, Microsoft Azure, IBM, Salesforce.

UNIT – III COLLABORATING USING CLOUD SERVICES **15 Hrs**

Email Communication over the Cloud - CRM Management - Project Management- Event Management - Task Management – Calendar - Schedules - Word Processing – Presentation – Spreadsheet - Databases – Desktop - Social Networks and Groupware.

UNIT – IV VIRTUALIZATION FOR CLOUD **13 Hrs**

Need for Virtualization – Pros and cons of Virtualization – Types of Virtualization – System VM, Process VM, Virtual Machine monitor – Virtual machine properties - Interpretation and binary translation, HLL VM - Hypervisors – Xen, KVM , VMWare, Virtual Box, Hyper-V.

UNIT – V SECURITY, STANDARDS AND APPLICATIONS **12 Hrs**

Security in Clouds: Cloud security challenges – Software as a Service Security, Common Standards: The Open Cloud Consortium – The Distributed management Task Force – Standards for application Developers – Standards for Messaging – Standards for Security, End user access to cloud computing, Mobile Internet devices and the cloud.

Text Book

- John Ritting house & James Ransome. (2010). *Cloud Computing . Implementation Management and Strategy*. CRC Press.

Reference Books

- David E.Y. Sarna. (2011). *Implementing and Developing Cloud Application*. CRC press.
- Lee Badger, Tim Grance, Robert Patt-Corner, Jeff Voas, NIST, Draf. *(2011). Cloud computing synopsis and recommendation*.
- Anthony T Velte, Toby J Velte, Robert Elsenpeter. (2010). *Cloud Computing : A Practical Approach*. Tata McGraw-Hill.
- Michael Miller. (2008). *Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate.* Que Publishing.

III and IV Evaluation Components of CIA

Semester	Part	Category	Course Code	Course Title	Component III	Component IV
V	III	Core X	UCAM507	Operating System	Case Study	Seminar using ICT Technique
	III	Core XI	UCAM509	Software Engineering	System Modeling	Seminar using ICT Technique
	III	Core XII	UCAM505	Web Programming	Program Writing	Webpage Design
	III	Core XIII	UCAM508	Open Source Technology	Problem Solving	Developing Web pages
	III	Core Practical VI	UCAR506	Open Source Technology Practical	DPA	Viva-voce
	III	Core Practical VII	UCAR505	Web Programming Practical	DPA	Viva-Voce
VI	III	Core XIV	UCAM609	Data Mining	Database Design	Seminar using ICT Technique
	III	Core XV	UCAM610	Computer Graphics	Simple Animation	Seminar
	III	Core XVI	UCAM611	Basics of IOT	Working Model	Simple programs
	III	Core Practical VII	UCAR602	Data Mining Practical	DPA	Viva-voce
	III	Major-Elective	UCAO606	Fundamentals of Security	Case Study	Seminar
	III	Major-Elective	UCAO604	Cloud Computing	Working Model	Seminar

DEPARTMENT OF PSYCHOLOGY

PREAMBLE

UG **:** Programme profile and the syllabi of courses offered in the V and VI semester along with evaluation components III & IV (with effect from 2018 - 2021 batch onwards).

PROGRAMMEPROFILE 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.
- Ability to use Laboratory skills in Psychology.
- Apply the Applications of Psychology in different fields.
- Analyzes the Human Behaviour in scientific manner.

Semester	Part	Category	Course code	Course Title	Previous Course Code	Hours per week	Credits Min/ Max
I	I	Language I	UTAL105/ UTAL106/ UHIL102/ UFRL102	Basic Tamil I/ Advanced Tamil I/ Hindi I / French I	UTAL103/ UTAL104/ UHIL101/ UFRL101	4	2/3
	II	English I	UENL107/ UENL108	General English I/ Advanced English I	- / UENL106	5	3/4
	III	Core I	UPSM101	General Psychology I		6	5
		Core II	UPSM102	Developmental Psychology I		7	5
		Core III	UPSM103	Social Psychology I		6	5
	IV	Value Education				2	1
TOTAL						**30**	**21/23**
II	I	Language II	UTAL205/ UTAL206/ UHIL202/ UFRL202	Basic Tamil II/ Advanced Tamil II/ Hindi II/ French II	UTAL203/ UTAL204/ UHIL201/ UFRL201	4	2/3
	II	English II	UENL207/ UENL208	General English II/ Advanced English II	- /UENL206	5	3/4
	III	Core IV	UPSM201	General Psychology II		5	5
		Core V	UPSM202	Developmental Psychology II		5	5
		Core VI	UPSM201	Social Psychology II		5	5
	IV	Non Major Elective	UPSE201	Psychology for Effective Living		4	2
		Soft skill				2	1
	V	Extension activity/ Physical Education/NCC				-	1/2
TOTAL						**30**	**24/27**

III	I	Language III	UTAL307/ UTAL308/ UHIL302/ UFRL302	Basic Tamil III/ Advanced Tamil III/ Hindi III/ French III	UTAL303/ UTAL304/ UHIL301/ UFRL301	4	2/3
	II	English III	UENL305/ UENL306	General English III/ Advanced English III	- / UENL306	5	3/4
	III	Core VII	UPSR301	Experimental Psychology I		6	5
		Core VIII	UPSM301	Psychological Statistics		5	5
		Core IX	UPSM302	Theories of Personality		5	5
	IV	Online Course		NPTEL/ Spoken Tutorial		3	1/2
		Value Education				2	1
TOTAL						**30**	**22/25**
IV	I	Language IV	UTAL405/ UTAL406/ UHIL402/ UFRL402	Basic Tamil IV/ Advanced Tamil IV/ Hindi IV/ French IV	UTAL403/ UTAL404/ UHIL401/ UFRL401	4	2/3
	II	English IV	UENL407/ UENL408	General English IV/ Advanced English IV	- /UENL406	5	3/4
	III	Core X	UPSR401	Experimental Psychology II		6	5
		Core XI	UPSM401	Physiological Psychology		7	5
		Core XII	UPSM402	Research Methodology		6	5
	IV	Soft skill				2	1
	V	Extension activity/ Physical Education/NCC				-	2
TOTAL						**30**	**21/25**
V	III	Core XIII	UPSM501	Abnormal Psychology		6	5
		Core XIV	UPSM502	Educational Psychology		6	5
		Core XV	UPSM 503	Positive Psychology		5	5
		Core XVI	UPSM 504	Organizational Psychology		6	5
		Core XVII	UPSM 505	Consumer Behaviour		5	5
		Value education				2	1
TOTAL						**30**	**26**
VI	III	Core XVIII	UPSM 601	Clinical Psychology		6	5
		Core XIX	UPSM 602	Counselling Psychology		6	5
		Core XX	UPSM 603	Human Resource Development		5	5
		Core XXI	UPSM 604	Health Psychology		6	5
		Core XXII	UPSP 601	Project		5	5
	IV	Soft skill				2	1
	V	Extension activity/ Physical Education/NCC				-	2
TOTAL						**30**	**26/28**
GRAND TOTAL						**180**	**140**	**154**

COURSES OFFERED TO OTHER DEPARTMENT
NON MAJOR ELECTIVE

Semester	Part	Category	Course Code	Course Title	Contact Hour/Week	Credit	
						Min	Max
II	IV	Non Major Elective	UPSE201	Psychology for Effective Living	4	2	2

Experiential Learning (Mandatory)

Course Mapping				Collaborating Agency - MSME		
Sem	**Course Code**	**Course Title**	**Assessment**	**Course Title**	**Hours / Days/ Month**	**Mode of Evaluation**
IV	**UPSM401**	Physiological Psychology	Component IV	Stress Management	Days	Reflection

Skill Orientation Programme (Only for the interested students) – Extra Credit Earning Provision

Sem	Category	Course Code	Course Title	Collaborating Agency	Hours / Days/ Month	Mode of Evaluation	Credits (Min/Max)
V	Core	UPSM 504	Aptitude & Soft Skills	TCIL-IT	days	Reflection	1
VI	Core	UPSM 603	International Journal Publishing	TCIL-IT	days	Reflection	1

ABNORMAL PSYCHOLOGY

UPSM501

Semester : V **Credits : 5**
Category : Core XIII **Hours / Week : 6**
Class &Major : III B.Sc. Psychology **Total Hours : 78**

Objectives:
To enable the students

- Knowing various approaches and theory of Abnormal Psychology.
- Understand the Classification System and Diagnosis of Psychological conditions.
- Applying the knowledge to identify different types of disorders, its causes and treatment.

Learning Outcomes:

On Completion of the course, the students will be able to

- Knowing personal and serial interactions by using the knowledge of the history and major theories of Abnormal Psychology.
- Understand one's own and others behavior by applying the knowledge of assessment, diagnosis, classification systems and DSM 5.
- Analyze the symptoms of specific types of abnormal behavior to evidence based strategies to assess and treat them

UNIT- I INTRODUCTION TO ABNORMAL PSYCHOLOGY AND MOOD DISORDERS 12 Hrs

Definition and Scope - Historical Conceptions-Mood Disorders-Depression-Depressive Disorders-Dysthymic Disorder-Bipolar Disorder- Bipolar I Disorder-Bipolar II Disorder-Cyclothymic Disorder – Suicide – Theories – Causes- Mental Illness and Prevention of Suicide.

UNIT- II ANXIETY DISORDERS AND SOMATOFORM DISORDERS 17 Hrs

DSM V and ICD Classification-Anxiety Disorders-The experience of Anxiety-Generalized Anxiety Disorder-Panic Disorder – Phobias- Obsessive Compulsive Disorder- Post Traumatic Stress Disorder- Interpretation and Treatment.

Somatoform Disorders- Pain Disorders- Somatisation Disorders- Conversion Disorders – Hypochondriasis- Body Dysmorphic Disorders.

UNIT-III PSYCHOTIC DISORDERS / PERSONALITY DISORDERS 17 Hrs

Symptoms – Factors – Vulnerability- Schizoaffective Disorders- Delusional Disorders-Shared Psychotic Disorder – Schizophrenia- Other personality Disorders- Causes and treatment.

UNIT- IV SUBSTANCE –RELATED DISORDERS AND SEXUAL DYSFUNCTION 17 Hrs

Substance Dependence- Substance Abuse – Alcoholism- Drug Abuse-Different Drugs-Causes and Treatment.

Sexual Disorders and Gender Identity Disorder -Sexual dysfunctions-Causes and treatment of sexual dysfunctions -Paraphilias – Causes and treatment -Sexual variants-Sexual and Gender Variants - Gender Identity Disorder-Treatment and Prevention

UNIT-V PERVASIVE DEVELOPMENTAL DISORDERS 15 Hrs

ADHD – Learning Disorders- Autism – Aspergers Syndrome – Intellectual disability-other disorders – Mental Retardation-Causes and Treatment. Eating -Disorders Anorexia Nervosa – Bulimia – Binge Eating Disorder– Causes and Treatment.

Text Book

- Sarason, I. G. & Sarason, B. R. (2002). *Abnormal Psychology. The Problem of Maladaptive Behaviour*. Pearson (10th ed.,). New Delhi

Reference Books

- Barlow, D. H.& Durand, V. M.(2015). *Abnormal Psychology. An Integrative Approach*. Wadsworth Thomson Learning. (7thed.,). Canada.
- Alloy, L. B. Riskind, J. H. & Manos, M.J. (2005). *Abnormal Psychology*. Tata McGraw Hill Publishing Company Ltd.(9th ed.,). New Delhi.
- Carson & Butcher.(2013). *Abnormal Psychology.* Pearson.(13th ed.,). New Delhi

E-Resources

- https://www.verywellmind.com/what-is-abnormal-psychology-2794775
- https://b-ok.cc/book/2918532/1c0aad
- https://b-ok.cc/book/2343192/43d9dd
- https://b-ok.cc/book/5010968/91cfd2?dsource=recommend

EDUCATIONAL PSYCHOLOGY

UPSM502

Semester : V	**Credits : 5**
Category : Core XIV	**Hours / Week : 6**
Class &Major: III B.Sc. Psychology	**Total Hours : 78**

Objectives:

To enable the students

- Know the various aspects related to the instructional process.
- Understand about the Psychological elements in learning process and different views about learning.
- Applying Principles to Development in Education.

Learning Outcomes:

On Completion of the course, the students will be able to

- Understand the application and communicate scientific knowledge of Educational Psychology.
- Apply knowledge through class room activities and case studies.
- Analyze underlying views of the cognitive process including an investigation of education.

UNIT- I INTRODUCTION TO EDUCTIONAL PSYCHOLOGY 15 Hrs

Definition- Historical Background-Role and Scope of Educational Psychology- Effective Teaching Methods.

UNIT- II UNDERSTANDING STUDENT DEVELOPMENT AND DIVERSITY 15 Hrs

Understanding Student Development and Diversity- General Principles of Development- Importance of Development in Education- Brain and Cognitive Development- Language Development- Importance of Personal- Social and Emotional Development- Importance of Culture- Community and Gender.

UNIT- III UNDERSTANDING LEARNING PROCESS 16 Hrs

Understanding Learning Process - Importance of Behavioural Approaches to Learning - Importance of Information Processing Approach- Complex Cognitive Processes-Importance of Social- Cognitive and Constructivist Views of Learning.

UNIT-IVUNDERSTANDING INSTRUCTIONAL PROCESSES 16 Hrs

Motivation in Learning and Teaching - Creating Learning Environment - The Need for Organization - Positive Environment- Maintaining a Good Environment for Learning- Teaching for Academic Learning Planning - Teacher-centered Lesson- Planning and Instruction - Lesson-Centered Lesson- Planning and Instruction- Classroom Management - Designing Physical Environment of the Classroom- Creating Positive Environment for Learning- Classroom Assessment.

UNIT - V STUDENTS WITH SPECIAL EDUCATIONAL NEEDS 16 Hrs

Students with Special Educational Needs -Learning Disabilities – Types- Remedial teaching - Gifted students

Text Book

- Woolfolk, A. (2017). *Educational Psychology*. Pearson Education. (13th ed.,).

Reference Books

- Santrock, J. W.(2004). *Educational Psychology*. International Edition McGraw Hill.(2nd ed.,).
- Ormrod, J. E. (2000). *Educational Psychology Developing Learners*. New Jersey Merril. (2nd ed.,).

E-Resources

- https://b-ok.cc/book/830035/00a957
- http://elibrary.bsu.az/books_163/N_55.pdf
- https://b-ok.cc/book/3519689/557777

POSITIVE PSYCHOLOGY

UPSM503

Semester : V **Credits : 5**
Category : Core XV **Hours / Week : 5**
Class &Major: III B.Sc. Psychology **Total Hours : 65**

Objectives:

To enable the students

- Knowing the various Psychological concepts of Health behavior
- Understand the skills of Coping with Illness
- Applying the techniques of Positive Psychology in life

Learning Outcomes:

On Completion of the course, the students will be able to

- Understanding the theories, techniques and evidence based on Positive Psychology.
- Utilize their own strength strategies and apply strategies to increase their happiness, quality of life and well being
- Apply the positive psychology techniques to enhance the well being of individuals, groups, communities and work places.

UNIT - I INTRODUCTION POSITIVE PSYCHOLOGY 14 Hrs

Definition - Goals and Assumptions - Relationship with Health Psychology- Developmental Psychology - Clinical Psychology.

UNIT - II POSITIVE EMOTIONS, WELL-BEING AND HAPPINESS 14 Hrs

Positive emotions - Broaden and Build Theory - Cultivating Positive Emotions - Happiness Hedonic and Euaimonic - Well- Being - Negative vs. Positive Functions - Subjective well –Being – Emotional- Social and Psychological well-being - Model of complete mental life.

UNIT - III SELF CONTROL, REGULATION AND PERSONAL GOAL SETTING 13 Hrs

The value of self control - Personal goals and self regulation - Personal goal and well-being - Goals that create self regulation – Every day Explanations for Self control failure problems.

UNIT -IV POSITIVE COGNITIVE STATES AND PROCESSES 11 Hrs

Resilience - Developmental and Clinical Perspectives - Sources of Resilience in children - Sources of Resilience in adulthood and later life - Optimism- How optimism works - Variation of optimism and pessimism – Spirituality - The search for meaning (Frankl) - Spirituality and well-being - Forgiveness and gratitude.

UNIT- V APPLICATIONS OF POSITIVE PSYCHOLOGY 13 Hrs

Positive schooling – Components - Positive coping strategies - Gainful employment Mental health - Moving toward Balanced Conceptualization - Lack of a Developmental Perspectives.

Text Book

- Baumgardner, S.R & Crothers, M.K. *Positive Psychology*.(2010). U.P. Dorling Kindersley Pvt Ltd. (5^{th} ed.,).

Reference Books

- Snyder, C.R. & Lopez, S.J. (2002). *Handbook of positive psychology*. Oxford University Press.(3^{rd} ed.,). New York.
- Carr, A.(2004). *Positive psychology the science of happiness and human strengths*. Routledge. (2^{nd} ed.,). New York.
- Singh, A .(2013). *Behavioral science Achieving behavioral excellence for success*. Wiley India Pvt .(3^{rd} ed.,). New Delhi.

E-Resources

- https://www.verywellmind.com/what-is-positive-psychology-2794902
- http://www.positivepsychologyinstitute.com.au/what_is_positive_psychology.html
- https://en.wikipedia.org/wiki/Positive_psychology
- https://ppc.sas.upenn.edu/

ORGANIZATIONAL PSYCHOLOGY

UPSM504

Semester : V **Credits : 5**
Category : Core XVI **Hours / Week : 6**
Class &Major: III B.Sc. Psychology **Total Hours : 78**

Objectives

To enable the students

- Understand the Behaviour of Individuals in the Organizational Context.
- Acquire the factors that contribute to achieve Organizational Effectiveness, at the Individual, Group and Structural Level.
- Applying Organizational Principles in Managements.

Learning Outcomes

On Completion of the course, the students will be able to

- Understand Organizational Theories to specific Organization Situations
- Applying skills to Collaborative teamwork, Time management, Self motivation in their work place
- Evaluate theoretical knowledge for Solving problem, Making decisions, and Develop Organizational skills.

UNIT- I INTRODUCTION **15 Hrs**

Definition-Models of OB – Autocratic – Custodial – Supportive- Collegial and System-Historical Evolution of OB – Contributing Disciplines to OB - Challenges and Opportunities.

UNIT- II THE INDIVIDUAL IN ORGANIZATION **16 Hrs**

Foundations of Individual behavior- Attitudes and Job satisfaction- Personality and values- Perception and Individual Decision Making - Motivation Concepts and Applications. Emotions and Moods.

UNIT- III THE GROUP IN ORGANIZATION **16 Hrs**

Foundations of Group Behavior-Understanding Work teams – Communication- Basic Approaches to Leadership and Contemporary Issues - Power and Politics- Conflict and Negotiation.

UNIT- IV THE ORGANIZATION SYSTEM AND STRESS MANAGEMENT **16 Hrs**

Foundations of Organization structure - Work Design - Organizational Culture- Human Resource Policies and Practices-Work stress and its management.

UNIT- V ORGANIZATIONAL DEVELOPMENT **15 Hrs**

Organizational Change – Forces for Change - Managing Planned Change - Resistance to Change-Approaches to Managing Organizational Change- Contemporary Change Issues.

Text Books

- Stephen P. Robbins & Timothy A. Judge.(2017).*Organizational Behaviour*. Pearson Education Ltd. (17th ed.,).

References

- Eugene McKenna. (2012). *Business Psychology and Organizational Behaviour*. Psychology Press Distributed by I K International Pvt. Ltd .(4th ed.,). New Delhi.
- John W. Newstrom. (2007). *Organizational behaviour – Human Behaviour at Work.* Tata McGraw Hill Publishing Company Ltd. (12th ed.,). New Delhi.
- John W Slocum and Don Hellriegel. (2007). *Fundamentals of Organizational Behaviour*. Thomson Learning India. (3rd ed.,).

E-Resources

- https://b-ok.cc/book/2330334/0549d4
- https://b-ok.cc/book/2925859/022aca
- https://bok.cc/s/?q=Stephen+P.+Robbins+and+Timothy+A.+Judge%2C+Organizational+Behaviour%2C+

CONSUMER BEHAVIOUR

UPSM505

Semester : V **Credits : 5**
Category : Core XVII **Hours / Week : 5**
Class &Major: III B.Sc. Psychology **Total Hours : 65**

Objectives:

To enable the students

- Understand factors and facets of Consumer Behaviour
- Acquire the Consumer Behaviour in different settings.
- Applying the Attitude of Consumers and Communication Process

Learning Outcomes:

On Completion of the course, the students will be able to

- Understand the dynamics of human behaviour and the basic factors that influence.
- Apply the concepts of marketing strategy.
- Evaluate and compare the decision process in consumer and organizational markets.

UNIT -I INTRODUCTION TO CONSUMER BHEVARIOUR 14 Hrs

Definition – Scope - Consumer Roles - History of Consumer Behaviour and the marketing concept - Contributing Disciplines and Application of Consumer Behaviour- Market Segmentation – Need and Types – Geographic - Demographic - Psychographic and life style. Product Positioning- Need and Strategy.

UNIT- II FACTORS INFLUENCING CONSUMER BEHAVIOUR 14 Hrs

Consumer motivation – Needs – Goals - Motive Arousal - Reactions to Frustration - Consumer Personality – Nature - Influences on Consumer Behaviour - Consumer Emotions – Nature - Uses in Advertising - Consumer Perception and its implications - Consumer Learning - Classical and Instrumental theories in the context of Consumer Behaviour.

UNIT- III CONSUMER ATTITUDE AND COMMUNICATION PROCESS 13 Hrs

Attitude – Functions - Tri-component attitude model and Katz's models of attitude and attitude change - Post purchase attitude change - Cognitive dissonance theory and attribution theory - Marketing communication - Process – Barriers and types of communication systems, Source - Message and Medium of Communication.

UNIT- IV CONSUMERS IN THEIR SOCIAL AND CULTURAL SETTINGS 11 Hrs

Reference group – Nature and types - Influences on consumers - Family life cycle stages - Nature of household and purchases - Family decision making and resolving conflict - Social class- Nature of social class - Symbols of status - Concept of money and social class - Social class categories and Consumer Behaviour.

UNIT- V CONSUMER DECISION MAKING **13Hrs**

Consumer Decision - Stages in Consumer Decision Process – Situational Influence - Problem recognition - Information search - Evaluation of alternatives and selection - Outlet selection and purchase - Post purchase action - Organizational Buyer – Nature - Market Structure and pattern of demand – Characteristics - Decision Approach -Purchase pattern and organizational buyer decision process.

Text Books

- Kumar, A & Singh, K.(2013). *Consumer Behaviour and Marketing Communication: An Indian Perspective*. Dream tech Press. (1st ed.,). New Delhi.

References

- Schiffman LG & Kanuk LL. (2007). *Consumer Behaviour*. Prentice-Hall of India Pvt Ltd,(9th ed.,). New Delhi.
- Batra Satish, K.& Kazmi, S.H.H. (2007). *Consumer Behaviour Text and Cases Excel Books*. Naraina Phase I. (3rd ed.,). New Delhi.

E-Resources

- https://www.verywellmind.com/what-is-consumer-psychology-2794899
- https://www.britannica.com/science/consumer-psychology
- https://www.emotiv.com/glossary/consumer-psychology/
- https://en.wikipedia.org/wiki/Consumer_behaviour

CLINICAL PSYCHOLOGY

UPSM601

Semester : VI **Credits : 5**
Category : Core XVIII **Hours / Week : 6**
Class &Major: III B.Sc. Psychology **Total Hours : 78**

Objectives:

To enable the students

- Understand traditional and development of Clinical Psychology.
- Acquire the importance skills in Psychological Testing.
- Applying the therapeutic skills in Clinical Settings.

Learning Outcomes:

On Completion of the course, the students will be able to

- Understand the History of Psychology as it pertains to the development of these theories and their scientific foundations.
- Demonstrate foundational knowledge of the theories as well as the empirical evidence supporting the Theories of Personality, Social Psychology, Cognitive Aspects of behavior, Human Development, Biological aspects of behavior, and Psychopathology.,
- Valuate scientific research in the selection and implementation of Clinical Interventions and utilize clinical data to inform Diagnostic Formulations and Treatment Plans.

UNIT-I INTRODUCTION TO CLINICAL PSYCHOLOGY 16 Hrs

Define Clinical Psychology-The Perspectives of Clinical Psychology- Five Models of Mental Health-Some Cautionary Comments-Models of Intervention and Psychiatric Ideologies-The Role and Contribution of the Clinical Psychologist.

UNIT-II TESTING IN CLINICAL PSYCHOLOGY 16 Hrs

General Principles- Testing in Clinical Practice - Research and Training –What is Psychological Test-Three Strategies of Personality Test Development –Criteria for Judging Tests-Should this Patient be Tested-Choice of Test-Determinants of Test Performance

UNIT-III COGNITIVE BEHAVIOUR THERAPY 16 Hrs

Behavior therapy-Cognitive therapy- Cognitive-Behavior therapy-Current status in CBT.

UNIT-IV OTHER APPROACHES IN CLINICAL PSYCHOLOGY 15Hrs

Group therapy-Couples and family therapy-Community Psychology – Prevention-Self-Help-Technological innovation and treatment- Psychotherapy integration.

UNIT-V CLINICAL NEUROPSYCHOLOGY **15Hrs**

History-Basic Principles of Neuropsychology-Patterns of Neuropsychological Dysfunction-Assessment-Approaches to psychopathology-The current status of clinical neuropsychology.

Text Book

- Sheldon Korchin.J. *Modern Clinical Psychology*. (2004).Chennai CBS Publishers & Distributors Pvt. Ltd Reference Book Andrew. (1st ed.,).

Reference Books

- Pomerantz. M. (2001). *Clinical Psychology.* New Delhi Sage Publication Inc. (2nd ed.,).
- Geoffrey P. Kramer, Douglas A. Bernstein & Vicky Phares. (2013). *Introduction to Clinical Psychology*. Pearson.(8th ed.,).

E-Resources

- https://www.verywellmind.com/what-is-clinical-psychology-2795000
- https://b-ok.cc/book/739808/e12b28
- https://b-ok.cc/book/3510150/8c675b

COUNSELLING PSYCHOLOGY
UPSM602

Semester : VI **Credits : 5**
Category : Core XIX **Hours / Week : 6**
Class &Major: III B.Sc. Psychology **Total Hours : 78**

Objectives:

To enable the students

- Understand foundations and the therapeutic relationship of Counselling.
- Acquire assessment skills and diagnostic process of Counselling.
- Apply the Counselling skills to various fields.

Learning Outcomes:

On Completion of the course, the students will be able to

- Apply knowledge of individual, group theories of Counseling and Psychotherapy consistent with program orientation and goals
- Analyze issues and debates in Counselling Psychology
- Reflect on their role in different fields of Counselling

UNIT - I INTRODUCTION TO COUNSELLING PSYCHOLOGY 15 Hrs

Definitions of Counselling- Characteristics of a Counsellor - The Therapeutic Relationship - Qualities of Counselling relationship - Perspectives on Helping Relationships - Counsellor as Relationship Specialists - Conflict resolution in relationship - Practical dimensions of the therapeutic relationship.

UNIT - II APPROACHES IN COUSELLING 16 Hrs

Insight - Oriented Approaches Introduction to theory construction - Psychoanalytic counselling - Client- Centered Counselling - Existential counseling - Gestalt counseling - Honorable mentions - Action - Oriented Approaches –Behavioural counselling - Rational Emotive BehaviourCounselling - Strategic Counselling - Honourable mentions.

UNIT - III THEORY AND COUNSELLING SKILLS 16 Hrs

Integrating Theory and Counselling Skills A Personal journey - Movement toward integration -Grabbing truth by the tail - A personal theory - Stages developing personal theory - Procedure followed so far - Pivotal Counselling skills. Assessment Testing and the Diagnostic Process - The meaning of assessment - The role of testing the Assessment Process - Standardized Measures - Non - Standardized Measures- Using assessment methods in Counselling - Formal and functional diagnosis.

UNIT - IV GROUP COUNSELLING **16 Hrs**

Group Counselling Survey of groups - Some considerations in the use of group modalities - Counteracting potential limitations -Advantages of group work - Basic assumptions about groups - Group process stages - Cues for intervention - Specialized skills of group work.

Marital family and Sex Counselling- Family versus Individual Counselling - Family Counselling theories - Power in relationships –Symptoms and Solutions - Case example of family Counselling In action - Interpreting symptoms as metaphors - Diagnostic questions - Reframing -Directives - Ethical issues in family Counselling - Sex Counselling.

UNIT - V CAREER AND ADDICTION COUNSELLING **15 Hrs**

Career Counselling - The functions of work - Roles of Counselling -Theories of career development - Career education -Career decision making - Trends and issues in career counselling - Addictions Counselling - Symptoms of addiction - Drug use and drug abuse -Our drug culture - Counsellors Knowing of drugs - Effects drug abuse - Adolescent drug use - Prevention – Abuse in Special Populations - Principles for Counselling the Chemically dependent.

Text Book

- Corey, G. (2000). *Theory & Practice of Counselling and Psychotherapy*. Singapore books Cole. (6th ed.,)

Reference Books

- Kottler, J.A. & Brown, R.W. (2008). *Introduction to Therapeutic counselling*. Pearson.(4th ed.,)
- Gelso, C.J. & Fretz, B.R. (1995). *Counselling Psychology*. Bangalore Prism books Pvt. Ltd.(3rd ed.,)
- Madhukar, I.(2000). *Guidance and Counselling*. Authors Press.(2nd ed.,). New Delhi.
- Bordin, E.S.(1968). *Psychology of Counselling*. Appleton Centaury crafts. (4th ed.,). New York.
- NarayanaRao, S.(1981). *Counselling psychology*. Tata McGraw- Hill Publishing Company Ltd.(2nd ed.,). New Delhi.

E-Resources

- https://b-ok.cc/book/3645141/1fffe9
- https://b-ok.cc/book/3561150/37dd0a?dsource=recommend
- https://b-ok.cc/book/897065/4869e4?dsource=recommend

HUMAN RESOURCE DEVELOPMENT
UPSM603

Semester : VI	**Credits : 5**
Category : Core XX	**Hours / Week : 5**
Class &Major: III B.Sc. Psychology	**Total Hours : 65**

Objectives:

To enable the students

- Understand the basic concept used in Human Resource Development.
- Acquire HR skills for selection and career planning.
- Evaluate the performance appraisal in industrials area / work place.

Learning Outcomes:

On Completion of the course, the students will be able to

- Develop, implement, and evaluate organizational development strategies aimed at promoting organizational effectiveness.
- Collaborate with others, in the development, implementation, evaluation of organizational, health, safety policies and practices
- Achieve professional development and provide leadership to others in the achievement of ongoing competence in human resources professional practice.

UNIT- I HRM INTRODUCTION **11 Hrs**

Human Resource Management – Definition –Objectives – Scope – Functions of HRM. Job analysis – Process of job analysis - Team analysis – Employee Empowerment.

UNIT- II HR PLANNING AND SELECTION **13 Hrs**

Human Resource Planning – Objectives – Process of HRP– Recruitment – Sources of recruitment - Selection Procedure - Test and Interview - Types – Reference check – Final selection -Placement – Induction.

UNIT -III HRD AND CAREER PLANNING HRD **13 Hrs**

Need – Functions – Training – Methods – Executive Development – Differences between Training and Development - Career Planning – Process – Succession Planning - Concept of Quality of Work Life (QWL).

UNIT- IV PERFORMANCE APPRAISAL AND JOB EVALUATION **14 Hrs**

Performance appraisal – Process – Techniques – Difference between Performance Appraisal and Job Evaluation - Job Evaluation – Process – Potential Appraisal.

UNIT -V PROMOTION AND ABSENTEEISM **14 Hrs**

Promotion – Criteria – Benefits of effective promotion policy - Transfer – Purpose of transfer - Absenteeism – Causes – Measures - Labour Turnover – Separation – VRS - Retirement – Dismissal.

Text Book

- Khanka, S.S. *Human Resource Management*. (2003).Sulthan Chand & Sons.(1st ed.,). New Delhi.

Reference Books

- Mamoria, C.B. (2010). *Personnel Management*. Himalaya Publications House.(2nd ed.,)
- Jayasankar, J.(2016). *Human Resource management*. Margham Publication Chennai.(4th ed.,)
- Aswathappa, K. (2017). *Human Resources and Personnel Management*. TMH.(2nd ed.,). New Delhi.
- Kaushal Kumar.(2014). *Human Resources Management*. ABD Publishers. (5th ed.,)
- Kaushal Kumar.(2014). *Human Resources Management*.ABD Publishers.(1st ed.,)
- Keith Davis. (2015). *Human Relations at work*. TMH. G.R. Bassotia, Human Resources Management, Mangal Deep Publications.(2nd ed.,)
- Dr.Ramesh, K. (2014). *Human Resource Management*. Mithila Publications.(3rd ed.,)

E-Resources

- https://b-ok.cc/book/2651962/448783
- https://b-ok.cc/book/3427742/74fd28?dsource=recommend
- https://b-ok.cc/book/3423809/d32c71?dsource=recommend

HEALTH PSYCHOLOGY
UPSM604

Semester : VI **Credits : 5**
Category : Core XXI **Hours / Week : 6**
Class &Major: III B.Sc. Psychology **Total Hours : 78**

Objectives:

To enable the students

- Understand psychological factors and physical health.
- Acquire the coping mechanism for illness.
- Apply the methods of health enhancement.

Learning Outcomes:

On Completion of the course, the students will be able to

- Understand physiological, psychological and social aspects of stress illness
- Analyze psychological research and relevant to Health Psychology.
- Evaluate strategies for coping with stress inoculation therapy, yoga and meditation.

UNIT – I INTRODUCTION TO HEALTH PSYCHOLOGY **15 Hrs**

Definition and Need-The biopsychosocial model - Patient Practitioner Relationship- Training for a career in Health Psychology- Introduction to Health Behaviour- Factors Influencing the Practice of Health Behaviour.

UNIT – II MODELS OF HEALTH BEHAVIOUR **15 Hrs**

Changing health habits using theoretical models - Health belief model- Theory of planned behaviour - Cognitive Behavioural Approaches to Change Health Behaviour - Trans Theoretical Model of Behaviour Change - Avenues for Health Habit Modification.

UNIT – III CHRONIC ILLNESS AND PAIN **16 Hrs**

Illness Factors – Onset – Progression-Types of Symptoms - Quality of Life- Personal issues in chronic illness- Coping with chronic illness - Co management of chronic illness- Psychosocial Interventions –Pain - Definition-Types of Pain- Pain control techniques- Pain Management.

UNIT - IV STRESS AND COPING **16 Hrs**

Stress – Definition - Dimensions of Stress - Sources of Chronic Stress- Theoretical Contributions - Lazarus's Appraisal Model - Flight or fight response - General adaptation Syndrome- Tending and Befriending Model- Coping with stress- Sources of stress.

UNIT - V PROMOTING HEALTH BEHAVIOUR **16 Hrs**

Smoking -Effects of smoking - Reasons for Smoking –Alcoholism – Effects - Reasons - Interventions for reducing smoking - Changing problem drinking - Management of Overweight & obesity - Effects of dieting & physical activity.

Text Book

- Boyer, B,& Paharia, I.(2008).*Comprehensive handbook of clinical health psychology*. Edison, NJ: John Wiley & Sons. 4th ed.,

Reference Books

- Marks, D., Murray, M., Evans, B., Willig, C, Woodall, C.,&Sykes, C.M.(2008). *Health psychology Theory research and practice*. Sage Publications. (2nd ed.,). New Delhi.
- Branmon, L., & Frist, J.(2010). *Introduction to health psychology*. Cengage Learning India Pvt Ltd.(3rd ed.,). New Delhi.
- Sarafino, E.(1994). *Health psychology*. John Wiley & Sons.(3rd ed.,).
- Taylor, S.(1995). *Health psychology*. McGraw-Hill Ryerson (2nd ed.,).Toronto Canada.

E-Recourses

- https://b-ok.cc/book/592699/b141ff
- https://b-ok.cc/book/834970/179bc9
- https://b-ok.cc/book/3368860/383795?dsource=recommend
- https://b-ok.cc/book/2867427/24274e?dsource=recommend
- https://b-ok.cc/book/2573319/f4538e?dsource=recommend
- https://b-ok.cc/book/2573296/514609?dsource=recommend

III and IV EVALUATION COMPONENTS OF CIA

Semester	Category	Course Code	Course Title	Component III	Component IV
V	Core XIII	UPSM 501	Abnormal Psychology	Cases study	Seminar
	Core XIV	UPSM 502	Educational Psychology	Assignment	Seminar
	Core XV	UPSM 503	Positive Psychology	Assignment	Seminar
	Core XVI	UPSM 504	Organizational Psychology	Cases study	Seminar
	Core XVII	UPSM 505	Consumer Behaviour	Assignment	Seminar
VI	Core XVIII	UPSM601	Clinical Psychology	Report Writing	Seminar
	Core XIX	UPSM602	Counselling Psychology	Assignment	Seminar
	Core XX	UPSM603	Human Resource Management	Assignment	Seminar
	Core XXI	UPSM604	Health Psychology	Assignment	Seminar

UPSR601-PROJECT

Semester : VI **Credits : 5**
Category : Core XXII **Hours / Week : 5**
Class &Major : III B.Sc. Psychology **Total Hours : 65**

Guidelines

This course in offered as individual project

Evaluation patterns for the project (Internal-60, External-40)

SI. NO	Components	Marks	
		CIA	ESE
1	Title of the Topic	10	
2	Review of Literature	10	
3	Statement of the problem	10	
4	Research Design and Statistical tool	10	
5	Result	10	
6	Project Report	10	
7	Writing Report		20
8	Oral Presentation		10
9	Viva-voce		10
TOTAL		60	40

INTERNAL QUALITY ASSURANCE CELL (IQAC)

I.M.Phil., PROGRAMME PROFILE- Allotment of Hours &Credits

(With effect from 2020-2021 batch onwards)

I-Semester	II-Semester	Credits
Paper-I(6 hrs)	-	5
Paper-II(6 hrs)	-	5
Paper-III(Special area study paper)	-	5
Paper-IV(Research and Publication Ethics) (2 hrs)	-	2
-	Dissertation & Viva voce	13
• Paper Presentation(minimum one)& • Publication of articles in journals(minimum one) are mandatory for submission of Dissertation		30

II.ONLINE TEACHING

` It is proposed to conduct online teaching for all the classes through Microsoft Teams till the normal functioning of the Colleges for the academic year 2020- 2021. Tentative commencement date is 1st August.

III. INTRODUCTION OF SKILL ORIENTATION AND GOVT OF INDIA CERTIFIED COURSES

A. Skill Orientation Programme (only for interested students) - Extra Credit Provision

Four days courses offered by MSME/GOI as Skill Orientation Programme with maximum of 1 credit under extra credit earning provision.

B. Experiential Learning (Mandatory) - Discipline/Course Based

- Two days courses offered by MSME/GOI as Experiential Learning category have component IV can be incorporated in our courses.
- The department can be offered minimum one course for II to VI semesters.

Courses offered by MSME/GOI

Department	Semester	Name of the Course
Tamil	II & VI	• Beautician Course Training • Social Media Marketing Training
English		• Effective Communication
Business Administration		• Social Media Marketing Training • Data Analytics Certification • Business Analytics Certification
Commerce		• GST Practitioner Training

Mathematics		• Statistical Process Control • Applied Statistics Certification • Content Writing (Blogs, Website & Profiles) • Data Science Certification
Physics		• Solar Energy Training
Chemistry		• Organic Farming Training (or) • Solar Energy Training
Bio- Chemistry		• Organic Farming Training
Computer Science		• Data Science Certification • Robotics Process Automation
Psychology		• Applied Statistics Certification • Content Writing (Blogs, Website & Profiles) • Stress Management

IV.PART IV-VALUE EDUCATION (UG)

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

ENVIRONMENTAL SCIENCE

UESV310

Semester : III **Credit : 1**
Category : Value Education **Hours/Week: 2**
Class &Major: II UG **Total Hours : 26**

Objectives

To enable the students

- Understand the environment.
- Compare environmental pollution.
- Apply the knowledge in understanding various environmental issues and problems**.**

Learning Outcomes

On completion of the course, the student will be able to

- Understands the social issues and the environment
- Acquires the knowledge of ecosystem and biodiversity.
- Applies the knowledge to control the air pollution.

UNIT - I ECOSYSTEM AND BIODIVERSITY 8 Hrs

Ecosystem - Structure and function of an Ecosystem. Producers - consumers, and decomposers-Energy flow in the Ecosystem-Food chains food webs and Ecological pyramids-Introduction – Types -Characteristic features-Structure and function of forest, Grassland-Desert and aquatic (fresh water, esturine and marine) ecosystems.

Biodiversity–Definition - Genetic species and ecosystem diversity - Value of biodiversity - consumptive use - productive use Social, Ethical, Aesthetic and option values - Hotspots of biodiversity-Threats to biodiversity, habitat loss, poaching of wildlife, human wildlife conflicts.

UNIT - II AIR POLLUTION 9 Hrs

Definition and Classification -Chemical and Photochemical reaction in different layers of atmosphere -Causes - Sources - Effects and control measures of air pollutants - Mechanism and effects of air pollution phenomenon – Global Warming - Ozone Depletion - Acid Rain - Sulfurous Smog and Photochemical Smog.

UNIT - III SOCIAL ISSUES AND THE ENVIRONMENT 9 Hrs

Human population growth -Impacts on environment -Human health and welfare - Resettlement and rehabilitation of projects affected persons - Case studies - Disaster management: floods – earthquake - cyclone and landslides - Environmental movements: Chipko - Silent Valley - Bishnois of Rajasthan - Environmental ethics : Role of Indian and other religions and cultures in environmental conservation -Environmental communication and public awareness, case studies(e.g. CNG Vehicles in Delhi)

Text Books

- De ,A. K. (2010). *Environmental chemistry.* New age international (P) Ltd. (7th ed.,) New Delhi.
- Raghavan Nambiar,K. (2010). *Text Book of Environmental Studies. (2nd* ed.,). Scitech Publications India Pvt Ltd. India.
- Sodhi,G. S.(2000). *Fundamental concepts of environmental chemistry*. (1st ed.,). Alpha Science International Ltd. India.

Reference Books

- Sharma, B.K. (2007). *Environmental chemistry*. Krishna Prakashan Media (P) Ltd., Meerut.
- Dara, S.S.& Mishra, D.D. (2012) *A text book of environmental chemistry and pollution control.* Shultan Chand and Company Ltd.(5th ed.,). New Delhi.
- Richard,T.Wright. (2008). *Environmental Science: Toward a Sustainable Future.* (10th ed.,). Prentice Hall.

E-Resources

- https://www.youtube.com/watch?v=QBmVwL1KCAM
- https://www.unesco.pl/fileadmin/user_upload/pdf/BIODIVERSITY_FACTSHEET.pdf
- https://www.basingstoke.gov.uk/content/page/26744/Air%20pollution%20-%20what%20it%20means%20for%20your%20health.pdf
- https://www.slideshare.net/tanvipotluri/role-of-it-in-environment-human-health

FUNDAMENTAL RIGHTS IN INDIAN CONSTITUTION

UESV311

Semester : I	**Credits : 1**
Category : Value Education	**Hours/Week : 2**
Class &Major : I UG	**Total Hours : 26**

Objectives

To enable the Students

- Understand and realize the nature, scope and importance of supreme law of the land.
- Analyze the role of state in Constitutional Governance and the recent development in all areas.

Learning Outcomes

On Completion of the course, the students will be able to

- Learner will gain knowledge about the basic six categories of rights.
- Understand the Fundamental Rights
- Follow and apply the rights in different field of activities

PREAMBLE:

- We, the people of India, having solemnly resolved to constitute India into a Sovereign socialist secular democratic republic and to secure to all its citizens. Justice, social, economic and political Liberty of thought, expression, belief, faith and worship Equality of status and of opportunity, and to promote among them all,
- Fraternity assuring the dignity of the individual and the unity and integrity of the Nation. In our constituent assembly this twenty-sixth day of November,1949, do hereby adopt enact and give to ourselves this constitution.

UNIT - I INTRODUCTION 9 Hrs

Constitutional Law – Constitutionalism - Salient Features of the Constitution of India - Theory of Basic Structure - Nature of the Indian Constitution – Federal - Unitary - Quasi-federal-Freedom of speech- Freedom of expression- Freedom of assembly without arms- Citizenship During the Commencement of the Constitution- the Citizenship Act 1955- Various enactments by Parliament.

UNIT - II FUNDAMENTAL RIGHTS 8 Hrs

Equality before Law - Non Discrimination - Reasonable Classification - Non-Arbitrarines - Protective Discrimination - Reservations in Appointments and Promotions- Abolition of Untouchability - Abolition of Titles - They remind Indian Citizens of their duty towards their society-fellow citizens and the nation- Value and preserve the rich heritage of the country's composite culture

.

UNIT- III RIGHT TO FREEDOM-I (ARTICLES14 -18) 9 Hrs

Freedom of speech and expression-Freedom to assemble peaceably and without arms - Freedom to form association or unions - Freedom to move freely throughout the territory of India -.Freedom to reside and settle in any part of the territory of India - On grounds of religion- race caste- sex or place of birth-Abolition of all titles except military and academic.

Text Books

- Mahendra, P. S .& Shukla's,V. N. (2008). *Constitution of India*. Eastern Book Co. (11th ed.,).
- Seervai, H.M. (1983). *Constitutional Law of India: a critical commentary*. Tripathi Publication.
- Jain, Indian, M.P.(2018). *Constitutional Law*. Lexi Nexis Publication. (8th ed.,).
- Basu.D.D. (2011). *Shorter to the Constitution of India*. Lexi Nexis Publication. (1sted.,).

Reference Books

- Lakshminath, A. (2002). *Basic Structure and Constitutional Amendments (Limitation and justiciability)*. Deep & Deep Publications.
- Granville Austin. (1999). *The Indian Constitution Corner Stone of a Nation*. Oxford.
- Lahoti Justice, R.C. (2004). *The spirit and backbone of Constitution of India*.Eastern. Book Company.

E-Resources

- https://en.wikipedia.org/wiki/Fundamental_Rights,_Directive_Principles_and_Fundamental_Duties_of_India
- https://www.constitution.org/cons/india/p03.html

Evaluation Components of CIA

1. Case Study - 20 Marks
2. Moot Court Exercise - 20 Marks
3. Case Law Analysis - 20 Marks
4. Group Discussion - 20 Marks
5.Assignment - 20 Marks

CYBER SECURITY

UWSV505

Semester	**: III**	**Credits**	**: 1**
Class	**: II UG**	**Hours/Week**	**: 2**
Category	**: VALUE EDUCATION**	**Total Hours**	**: 26**

Objectives

To enable the students

- Implement Cyber security Best Practices and Risk Management.
- Integrate Network Monitoring and Present Real-Time Solutions.
- Impact Cyber security Risk in an Ethical, Social, and Professional Manner.

Learning Outcomes

On Completion of the course, the students will be able to

- Learner will gain knowledge about Security Policies.
- Understand the principles of Web Security.
- Able to examine Secure Software Attributes.
- Understand key terms and concepts in Cyber law, Intellectual property, Cybercrimes, Trademarks and Domain theft.

UNIT – I **9 Hrs**

Cyber Security - Applications of Cyber Security - Cyber Attacks and their Classification. Cyber security in Finance - Safe Browsing - Tips for buying online.

UNIT – II **8 Hrs**

Cybercrime - Classification of Cybercrimes - Reasons of Cybercrimes - Kinds of Cybercrime- Data Frauds.

UNIT – III **9 Hrs**

Web Security - E-mail Security - Mobile Device Security - Social Media Security. Malware - Type of Malware - Antivirus - Securing computer using free antivirus.

Text Book

- Jeetendra Pande. *Introduction to Cyber Security*

E- Resources

- https://heimdalsecurity.com/pdf/cyber_security_for_beginners_ebook.pdf
- http://larose.staff.ub.ac.id/files/2011/12/Cyber-Criminology-Exploring-Internet-Crimes-and-Criminal-Behavior.pdf
- http://www.uou.ac.in/sites/default/files/slm/FCS.pdf
- https://cyber-cops.com/book_detail

Evaluation Components of CIA

1.Assignment - 20 Marks
2.Case Study - 20 Marks
3.Group Discussion - 20 Marks
4.Poster Presentation - 20 Marks
5.Peer Evaluation - 20 Marks

V.PART I – Hindi (I – IV SEMESTER) - COURSE PROFILE FOR UG

Semester	Part	Category	Course Code	Course Title	Contact Week	Credit	
						Min	Max
I	Part-I	Language	UHIL 102	HINDI-I	4	2	2
II	Part-I	Language	UHIL 202	HINDI-II	4	2	2
III	Part-I	Language	UHIL 302	HINDI-III	4	2	2
IV	Part-I	Language	UHIL 402	HINDI-IV	4	2	2

HINDI-I

UHIL102

Semester :I **Credit : 2**
Category : Language **Hours/week : 4**
Class & major: I-UG **Total Hours : 52**

Objectives

- Students will be guided to know about the grammatical rules of Hindi and to develop use of language without errors.
- Students are also guided to practice letter writing and Business correspondence.
- Improve the knowledge of Prose.

UNIT-I Prose Lessons **10 Hrs**

1. Sabyata Ka rahasya – Premchand (सभ्यताकारहस्य–प्रेमचंद)
2. Mitrata – Ramchandra Sukla (मित्रता – रामचंद्रशुक्ल)

3. Sadhachar ka Thabiz- Harishankar Parsai (सदाचारकाताबीज)

UNIT-II Prose Lessons **10 Hrs**

1. Gaura Gaai – Mahadevi Verma (गौरागाय- महादेवीवर्मा)
2. Devatavon Ke Anchal Mein - Agney (देवतावोंकेअंचलमें–अज्ञेय)
3. Gapshap - Naamvar Singh (गपशप–नामवरसिंह)

UNIT-III Applied Grammar **10 Hrs**

1. Gender Changing
2. Number Changing
3. Tense

UNIT-IV Applied Grammar **11 Hrs**

1. Correct the Sentences
2. Active voice and Passive Voice
3. Cases

UNIT-V Letter Writing **11 Hrs**

1. Personal Letters (Letter to Parents, Letter to Friends)
2. Business Letters (Enquiry, Order, Complaint Letters)
3. Technical Terminology (50 Words)

References

1. Gadyakosh.org
2. *Shastry and Apte. Hindi grammar. D.B. Hindi Pracharsabha. Chennai.*

HINDI-II
UHIL202

Semester : II **Credit : 2**
Category : Language **Hours/week : 4**
Class &Major : I-UG **Total Hours : 52**

Objectives

- The aim of this course is to introduce non detailed text through one act play and short stories.
- To cultivate Moral values through non-details.
- To develop translation skill in a student.

UNIT - I ONE ACT PLAY **10 Hrs**

1. Suuki Dali- Upendranath Ashk (सूखीडाली – उपेंद्रनाथअश्क)
2. Aurangajeb ki aakhiri raat – Dr, Ramkumar Verma (औरंगजेबकीआखिरीरात- रामकुमारवर्मा)

UNIT - II ONE ACT PLAY **10 Hrs**

1. Beemaar ka ilaaj – Uday Shankar Bhat (बीमारकाइलाज–उदयशंकरभट्ट)
2. Ande ke Chilke – Mohan Rakesh (अंडेकेछिलके- मोहनराकेश)

UNIT- III SHORT STORY **10 Hrs**

1. Idhgah – Premchand (ईद्गाह- प्रेमचंद)
2. Prayachit _ BhagavaticharanVarma(प्रायश्चित- भगवतीचरणवर्मा)

UNIT- IV SHORT STORY **11 Hrs**

1. Pita- Gyanranjan (पिता–ज्ञानरंजन)
2. Yog Deeksha – Raji Seth (योगदीक्षा- राजीसेठ)

UNIT- V TRANSLATION PRACTICE **11 Hrs**

Passages from English to Hindi (10 Passages)

References

- kahanikosh.org
- ekankikosh.org
- Anuvad Abhyas Part- III, T.Nagar, Chennai-17, D.B. Hindi PracharSabha.

HINDI-III

UHIL302

Semester	**: III**	**Credit**	**: 2**
Category	**:Language**	**Hours/week**	**: 4**
Class & major: II-UG		**Total Hours**	**: 52**

Objectives

- The aim of this course is to introduce Olden poetry and Trends.
- Introduction is also given to History of Hindi Literature .
- To educate about Ancient and Medieval Literature.

UNIT - I OLD POETRY **10 Hrs**

1. Kabir – first 10 dohas only
2. Surdas – Pad only (First Three only)
3. Rahim – 1-10 Dohas only

UNIT - II OLD POETRY **10 Hrs**

1. Meera Bai –Pad 9 first Three only)
2. Bihari – 1-10 Dohas
3. Thiruvaluuvar – Arthkhand only

UNIT- III HISTORY OF HINDI LITERATURE **10 Hrs**

1. Kaalvi bhajan
2. Aadikaleen Sahitya Ki visheshatayen
3. Aadikaalen kavi

UNIT- IV HISTORY OF HINDI LITERATURE **11 Hrs**

1. Bhakti kaaleen Sahitya Ki visheshatayen
2. Sagun Bhakti aur Nirgun Bhakti
3. Bhakikaalen Kavi

UNIT- V HISTORY OF HINDI LITERATURE **11 Hrs**

1. Reetikaalen Sahitya Ki Paristhithi
2. Reetikaalen Sahitya Ki visheshatayen
3. Reetikaleen kavi

Text Book

- Poetry Selections 2001. University of Madras. Chennai. University Publications

References

- Rajnath Sharma. & Vinod Pustak Mandir. *Hindi Sahitya ka ithihas.* Agra.
- Nagendra, *Hindi Sahitya kaithihas.*National Publishing House. New Delhi.

HINDI-IV

UHIL402

Semester : III **Credit : 2**
Category : Language **Hours/week : 4**
Class & Major: II-UG **Total Hours : 52**

Objectives

To Enable the Students

- Introduce modern poetry and modern Hindi Literature.
- Understand the modern Hindi Literature and writing skills.

UNIT-I MODERN POETRY **10 Hrs**

1. Apana Sansaar- MythilisharanGupt
2. Asha- Jai Shankar Prasad
3. Mitt iki Mahima- Shiv MangalSuman

UNIT –II MODERN POETRY **10 Hrs**

1. Sneh Sapat- Bavani Prasad Mishra
2. Aham- Naresh Mehta
3. Nimna madya varg- Prabhakar Machave

UNIT-III HISTORY OF HINDI LITERATURE **10 Hrs**

1. Bharatendu yugin Sahitya ki Visheshatayen
2. Diwedi Yugin Sahitya ki Visheshatayen
3. Chayavaadi aur Pragativaadi kavita

UNIT –IVHISTORY OF HINDI LITERATURE **11 Hrs**

1. Nayi Kavita ki visheshatayen
2. Hindi Upanya Sahitya ke Udbhav aur Vikas
3. Hindi Kahani Sahitya ke Udbhav aur Vikas

UNIT-V HISTORY OF HINDI LITERATURE **11 Hrs**

1. Hindi Natak Sahitya KeUdbhav aur Vikas
2. Hindi ekanki Sahitya ke Udbhavaur Vikas
3. Pramukh sahityakar-Premchand, Prasad, Nirala, Mahadevi Verma, Mythili sharan gupt,Nagarjun, Yashpal

Text Book:

- Poetry Selections. (2001). University of Madras. University Publications. Chennai.

Reference Books:

- Rajnath Sharma & Vinod PustakMandir. Hindi Sahityakaithihas. Agra.
- Nagendra, Hindi Sahityakaithihas. National Publishing House. New Delhi.

V. PART I – French (I – IV SEMESTER)

COURSE PROFILE FOR UG

Semester	Part	Category	Course Code	Course Title	Contact Hrs/ week	Credit
I	I	Language	UFRL102	FRENCH - I	4	2
II	I	Language	UFRL202	FRENCH - II	4	2
III	I	Language	UFRL302	FRENCH - III	4	2
IV	I	Language	UFRL402	FRENCH - IV	4	2

FRENCH-I

UFRL-102

Semester :I **Credit : 2**

Category : Language **Hours/Week : 4**

Class&Major: I-UG **Total Hours : 52**

Objective

- To enable the students to get acquainted with the basic language skills in French Language: Compréhension et Expression Orales et Écrites
- To introduce to the students basic elements of French Culture and Civilization

UNIT-I **10Hrs**

Saluer, Entrer en Contact avec quelqu'un, se présenter, s'excuser.

UNIT-II **10Hrs**

Demander de se présenter, présenter quelqu'un

UNIT-III **10Hrs**

Exprimer ses gouts, échanger sur ses projets

UNIT-IV **11Hrs**

Demander à quelqu'un de faire quelque chose

UNIT-V **11Hrs**

Demander poliment, parler d'actions passées.

Text Book

- **Latitudes 1**by Régine Mérieux & Yves Loiseau IDIER.
  Modules 1 & 2 Units 1, 2, 3, 4

FRENCH-II

UFRL202

Semester :I **Credit :2**

Category : Language **Hours/Week: 4**

Class& Major: I-UG **Total Hours : 52**

Objectives

- To enable the students to get acquainted with the basic language skills in French Language: Compréhension et Expression Orales et Écrites
- To introduce to the students basic elements of French Culture and Civilization

UNIT-I **10Hrs**

Proposer, accepter, refuser une invitation. Indiquer la date. Prendre et fixer un rendez-vous. Demander et indiquer l'heure.

UNIT-II **10Hrs**

Exprimer son point de vue positif et négatif, s'informer sur le prix.

UNIT-III **10Hrs**

S'informer sur la quantité, exprimer la quantité.

UNIT-IV **11Hrs**

Demander et indiquer une direction, localiser (près de, en face de…)

UNIT-V **11Hrs**

Exprimer l'obligation ou l'interdit, conseiller

Text Book

- **Latitudes 1**by Régine Mérieux & Yves Loiseau Edition.

FRENCH-III

UFRL-302

Semester :III	**Credit : 2**
Category : Language	**Hours/Week : 4**
Class& Major: II-UG	**Total Hours : 52**

Objectives

- To enable the students to get acquainted with the basic language skills in French Language: Compréhension et Expression Orales et Écrites
- To introduce to the students basic elements of French Culture and Civilization

UNIT-I **10Hrs**

Décrire un lieu, situer, se situer dans le temps.

UNIT-II **10Hrs**

Raconter, décrire les étapes d'une action, exprimer l'intensité et la quantité.

UNIT-III **10Hrs**

Interroger, décrire quelqu'un, comparer.

UNIT-IV **11Hrs**

Exprimer l'accord ou le désaccord, se situer dans le temps.

UNIT-V **11Hrs**

Parler de l''avenir, exprimer des souhaits, décrire quelqu'un.

Text Book

- **Latitudes 1**by Régine Mérieux & Yves LoiseauEdition DIDIER. Modules 3 & 4 Units 9, 10, 11, 12

FRENCH-IV

UFRL402

Semester :IV **Credit : 2**
Category : Language **Hours/Week: 4**
Class& Major: II-UG **Total Hours : 52**

Objectives

- To enable the students to get acquainted with the basic language skills in French Language: Compréhension et Expression Orales et Écrites
- To introduce to the students basic elements of French Culture and Civilization

UNIT-I **10Hrs**

Exprimer sa certitude et son incertitude, exprimer son approbation et son indifférence.

UNIT-II **10Hrs**

Exprimer et demander un point de vue.

UNIT-III **10Hrs**

Exprimer son intension de faire quelque chose (1), justifier un choix.

UNIT-IV **11Hrs**

Exprimer son intension de faire quelque chose (2), exprimer la restriction.

UNIT-V **11Hrs**

Exprimer le fait d'aimer, de préférer, comparer, exprimer sa joie et sa tristesse.

Text Book

Latitudes 2 by Régine Mérieux, Emmanuel Lainé & Yves Loiseau
Edition DIDIER. Modules 1 & 2 Units 1, 2, 3, 4

III& IV EVALUATION COMPONENTS OF CIA

Semester	Category	Course Code	Course Title	Class	Component -III	Component -IV
I	Language	UFRL102	French-I	I-UG	Assignment	Quiz
II	Language	UFRL202	French-II	I-UG	Assignment	Quiz
III	Language	UFRL302	French-III	II-UG	Assignment	Quiz
IV	Language	UFRL402	French-IV	II-UG	Assignment	Quiz

VII. RESEARCH METHODOLOGY

PRMC301

Semester : III **Credit : 4**
Category : Core course **Hours/Week: 5**
Class &Major: M.Sc/M.A degree **Total Hours: 65**

Objectives

To enable the students

- Enhance the knowledge on research and its methodologies.
- Familiarize writing research report and thesis.

Learning Outcomes

On Completion of the course, the students will be able to

- Formulate research problems
- Draft research reports

UNIT-I INTRODUCTION TO RESEARCH METHODOLOGY 07 Hrs

Meaning of research; objective of research; motivation in research; types of research-Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative, Conceptual vs. Empirical- research approaches; significance of research, research methods versus methodology; Research and scientific methods; Importance of knowing how research is done; Research process; Criteria for good research.

UNIT-II RESEARCH PROBLEM AND RESEARCH DESIGN 15 Hrs

Research problem: Selecting research problem; necessity of defining a problem; techniques of defining problem; formulation of research problem, objectives of research problem. Meaning of research design; need for research design; important concept related to research design; different research designs; basic principles of experimental design; important experimental design.

UNIT-III SAMPLING DESIGN, DATA COLLECTION AND ANALYSIS 18 Hrs

Census and sample surveys, Characteristics of good sample design Different types of sample designs, Techniques of selecting a random sample-Accepts of method validation, observation and collection of data, methods of data collection, sampling methods, data processing and analysis strategies and tools, data analysis with statically package (Sigma STAT,SPSS for student t-test, ANOVA, etc.), hypothesis testing.

UNIT-IV INTERPRETAION, REPORT WRITING, RESEARCH ETHICS AND IPR 15 Hrs

Interpretation and report writing; Meaning of interpretation; techniques of interpretation; precautions in interpretation; significance of report writing, layout of research report, types of reports; Presentation of research work-oral, poster and writing research paper; Precautions for writing research report, conclusion. Ethics-ethical issues, related to research, IPR-Intellectual Property Rights in Research and Development-Patents and Patent Laws: Objectives of the patent system - Basic, principles and general requirements of patent law.

Text Books

- Kothari, C. R. (1980). *Research Methodology: Research and techniques*, New Delhi: New Age International Publishers.
- Carlos, C.M. (2000) *Intellectual property rights. The WTO and developing countries: the TRIPS agreement and policy options.* Zed Books. New York.
- Beier F.K, Crespi R.S and Straus T. *Biotechnology and Patent protection.* Oxford and IBH Publishing Co. New Delhi.
- Darren George and Paul Mallery – *SPSS for Windows.* Pearson Education.

References

- Singh, Y. K. (2006). Fundamental of Research Methodology and Statistics. New Delhi. New International (P) Limited. Publishers.
- Wallinman,N. (2006). Your Research Project: A step-by-step guide for the first-time researcher. London: Sage Publications.
- Senthil Kumar Sadasivam and Mohammed Jaabir M. S. (2008). IPR. Bio safety and Biotechnology Management. Jasen Publications. India.
- Wilkilson , T.S. & Bhandarkar . P.L., (2000). Methodology and Techniques of Social Research. Mumbai. Himalaya Publishing House.

E-Resources

- http:// www.ptt.ed/-super7/430114401/4391.ptt/.
- https://www.heacademy.ac.uk/system/files/msor.3.ls.pdf
- 164.100.133.129.81/econtent/uploads/research-methods.pdf

தமிழாய்வுத்துறை

அலகு– 5 ஆய்வேடு உருவாக்கம் **10மணி**

ஆய்வுப் பொருள் விளக்கம் - ஆய்வுத் தலைப்பு விளக்கம் - ஆய்வு நெறிவிளக்கம் - சான்றாதாரங்கள் - இயல் பகுப்பு – விரித்தெழுதல் - ஆய்வுநடை– அடிக்குறிப்புகள் - கண்டுபிடிப்புகள் - தொகுப்புரை – ஆய்வடங்கல் தயாரிப்பு - சுறுக்கவிளக்கம் - பின்னிணைப்பு

பாடநூல்கள்

1. கோத்தாரி, C.R (1980). *ஆராய்ச்சி நெறிமுறைகள்*, ஆராய்ச்சி நுட்பங்கள். புதுதில்லி.
2. கார்லஸ், C.M. (2000). *அறிவுசார் சொத்துரிமைகள்* மற்றும் வளர்ந்துவரும் நாடுகள் பயண ஒப்பந்தம் மற்றும் கொள்கை விண்ணப்பங்கள் நியூயார்க்.
3. பாலசுப்ரமணியன், கு.வெ.,(2002). *ஆராய்ச்சி நெறிமுறைகள்.* உமாபதிப்பகம். தஞ்சை.

பார்வை நூல்கள்

1. சிங்,Y.K. *ஆராய்ச்சி நெறிமுறையின் அடிப்படைகள் மற்றும் புள்ளியியல்.* புதுதில்லி.
2. மு.பொன்னுசாமி. (1996). *அறிவியல் அணுகு முறையில் ஆராய்ச்சியியல்.* இந்து பதிப்பகம். கோயம்புத்தூர்.

II- M.A ENGLISH

UNIT-V DOCUMENTATION & THEORIES **10 Hrs**

Documentation: Format of the Thesis-Mechanics of Writing-Parenthetical Documentation-Working Bibliography, MLA style. Review of related literature its implications at various stages of research. (Formulation of research problem, hypothesis, interpretation and discussion of results). Major findings, Conclusions and suggestions. Citation of references and Bibliography. Theories and its background and Recent trends in Literature.

Text Books

- Gibaldi, Joseph. (2009). *MLA Handbook for Writers of Research Papers*. Modern Language Association of America.
- Fitzpatrick, Kathleen. (2016). *MLA Handbook*. The Modern Language Association of America.

II- M.COM

UNIT-V TOOLS FOR ANALYSIS **10 Hrs**

Statistical Tools – Descriptive statistics – Mean, Median Mode and Standard Deviation. Chi – square , T Test , ANOVA (one way), correlation, simple regression (Simple problems)

Text books

- Pannerselvam, R. *Research Methodology.(* 2004). Prentice Hall of India. New Delhi.

II-M.Sc., CHEMISTRY

UNIT-V COMPUTATIONAL METHODS **10 Hrs**

Applications of computer packages – Origin, chemdraw, chemsketch, end note and crossref. Introdution of computational chemistry-Ab initio methods – Density functional methods – semi empirical and empirical methods

Text Books

- Darren George and Paul Mallery. (2003). SPSS for Windows. Pearson Education.

Reference Books

- Senthil Kumar Sadasivam and Mohammed Jaabir M. S. (2008).IPR. Biosafety and Biotechnology Management. Jasen Publications. India.

II-M.sc., MATHEMATICS

UNIT-5 INTRODUCTION and TOOLS FOR TO LATEX **10 Hrs**

Basic LaTeX – Sample document and Key Concepts – Type style – Lists – Tables – vertical and horizontal spacing- Some common structures – mathematical symbols – arrays – space – change style – List - Defining commands and environment – Figures and tables – Tabular environment - sectioning – declaration – change the type style – accents – symbols.

Text books

- David F Griffiths and Desmond J. Higham. (1996). "*Learning LaTex"*. SIAM (Society for Industrial and Applied Mathematics) Publishers. PhidelPhia.

References

- Martin, J. Erickson and Donald Bindner. (2011). *A Student's Guide to the Study Practice and Tools of Modern Mathematics.* CRC Press. Boca Raton. FL.

II-M.sc., PHYSICS

UNIT-5 TOOLS FOR ANALYSIS **10Hrs**

Analytical Technique – principles of single crystal and powder X-ray diffraction, FT–IR, Raman and UV–visible spectrometers – SEM, TEM, EDAX, AFM, EPMA – Instrumentation – Sample preparation – Analysis of materials – study of dislocation – ion implantation uses.

Text books

- Sivasankar,B . (2012). *Instrumental methods of analysis*. Oxford University Press. New Delhi.

References

- Frank, A. Settle. (1997). *Handbook of Instrumental Techniques for Analytical Chemistry*. Upper Saddle River. NJ: Prentice Hall PTR. New Jersey.

II-M.sc., COMPUTER SCIENCE

UNIT-V TOOLS FOR ANALYSIS **10Hrs**

Interpretation of data and Paper Writing – Layout of a Research Paper, Journals in Computer Science, Impact factor of Journals, When and where to publish ? Ethical issues related to publishing, Plagiarism and Self-Plagiarism, Use of tools / techniques for Research: methods to search required information effectively, Reference Management Software like Zotero/Mendeley, Software for paper formatting like LaTeX/MS Office, Software for detection of Plagiarism.

Text books

- Darren George & Paul Mallery . *SPSS for Windows.* Pearson Education

References

- Leslie Lamport. LaTeX: *A Document Preparation System.* Second Edition.

VIII. RESEARCH AND PUBLICATION ETHICS

MRPE101

Semester	: I	Credits	: 2
Category	: Core IV	Hours/Week	: 2
Class	: M.Phil	Total Hours	: 30

Objectives

To enable the students

- For awareness about the publication ethics and publication misconducts.

UNIT - I PHILOSOPHY AND ETHICS **3 Hrs**

1. Introduction to philosophy: definition, nature and scope, concept, branches.
2. Ethics: definition, moral philosophy, nature of moral, Judgments and reactions.

UNIT - II SCIENTIFIC CONDUCT **5 Hrs**

1. Ethics with respect to science and research.
2. Intellectual honesty and research integrity.
3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP).
4. Redundant publications: duplicate and overlapping publications, salami slicing.
5. Selective reporting and misrepresentation of data.

UNIT – III PUBLICATION ETHICS **7 Hrs**

1. Publication ethics; Definition, Introduction and the importance.
2. A best practices standards setting initiatives and guidelines: COPE, WAME, Etc.,
3. Conflicts of interest.
4. Publication misconduct: Definition, Concept, Problems that lead to unethical behavior and vice versa, types.
5. Volition of publication ethics, Authorship and Contributor ship.
6. Identification of Publication misconduct, Compliance and Appeals.
7. Predatory Publishers and Journals.

UNIT -IV OPEN ACCESS PUBLISHING **4 Hrs**

1. Open access publication and initiatives.
2. SHERPA/Romeo online resource to check publisher copyright & Self-archiving Policies.
3. Software tool to identify predatory publication developed by SPPU.
4. Journal Finder / Journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc,.

UNIT -V PUBLICATION MISCONDUCT **4 Hrs**

A. Group Discussion (2 Hrs)

1. Subject specific, Ethical issues, FFP, Authorship,
2. Conflicts of interest
3. Complaints and appeals: Examples and Fraud from India and Abroad.

B. The software tools (2 Hrs)

Use of Plagiarism software like true it in Urkund and other open source software tools.

UNIT -VI DATABASES AND RESEARCH METRICS **7 Hrs**

A. Data Bases (4 Hrs)

1. Indexing database
2. Citation Database: Web of Science, Scopus, etc.

B. Research Metrics (3 Hrs)

1. Impact factor of Journal as per Journal citation report, SNIP, SJR, IPP, Cite Score.
2. Metrics: h – index, g – index, i 10 Index, Almetrics.

III & IV Evaluation Components of CIA

Semester	Category	Course Code	Course Title	Component III	Component IV
I	CORE IV	MRPE101	Research And Publication Ethics (RPE)	Assignment, Quiz	Group Discussion, Tutorials

IX. EXAMINATION REFORMS

ESE April 2020 & CIA (2020-21) : Online

Software : **cims.mastersofterp.in** (faculty login for question paper typing & Student's login for attending exam)

Question paper pattern : 30 MCQ; 10 Two Marks

Time Duration : 1 hour 30 minutes

Maximum Marks : 50

B. Streamlining Retest Provisions:

Theory: Semester I to VI for UG &I to IV for PG

- A student has to be present for the entire CIA test as per the schedule.
- If a student is absent due to her illness alone, she can take the retest with the payment of registration fee Rs. 500/- only after the approval of the Principal through course teacher, head of the department and controller of examinations and medical certificate has to be submitted.
- If a student did not fall in the above said category, she is eligible to take the odd semester courses in the odd semester and even semester courses in the even semester.

Note: If a student attending retest for CIA I during improvement period, question paper to be prepared from the CIA syllabus.

Practical

Provision for the retest (Practical) in CIA will be provided only for the CIA test I and it has to be completed before CIA test II with the approval of the Principal through controller.