

BPharm

	Title of the Course	Human Anatomy and	man Anatomy and Physiology I										
	Course Code	BP-101[T]											
					Part A								
							L	т	Ρ	С			
	Year	1st	Semester	1st		Credits	3	1	0	4			
	Course Type	Theory only	I	1		l.		1					
	Course Category	Foundation core											
	Pre-Requisite/s					Co-Requisite/s							
	Course Outcomes & Bloom's Level	CO1- Explain the gro CO2- Describe the v CO3- Identify the var CO4- Perform the var CO5- To analyze the	Explain the gross morphology, structure and functions of various organs of the human book/[BL1-Remember] Describe the various homeostatic mechanisms and their inderstand) Usenity the various tissues and organs of different systems of human book/[BL3-Evaluate) Perform the various experiments related to special senses and nervous system(BL3-Apply) To analyze the importance of blood, lymphatic system and immunity in human body (BL4-Analyze)										
	Coures Elements	Skill Development ✓ Entrepreneurship X Employability X Professsonal Ethics Gender X Human Values X Environment X	x		SDG (Goals)	SDG1(No poverty) SDG3(Good health and well-being) SDG4(Quality education) SDG4(Quality education) SDG17(Partnerships for the goals)							
					Part B					-			
Modules		Conte	ents			Pedagogy				Hours			
UNIT I	Introduction to human body Definition and scc life processes, homeostasis, basic anatomical across cell membrane, cell division, cell juncti by extracellular signal molecule. Forms of intr level of organization Classification of tissues, tissues.	pe of anatomy and phy I terminology. Cellular la ons. General principles acellular signaling: a) C structure, location and	ysiology, levels of structural organization and body evel of organization Structure and functions of cell or cell communication, intracellular signaling path Zontact-dependent b) Paracrine c) Synaptic d) En functions of epithelial, muscular and nervous and	systems, basic , transport way activation docrine Tissue connective	Lecture based learning, in	teractive class, Peer tutorial, Class using ICT tool/PPT/white board				10			
UNIT II	Integumentary system Structure and functions and functions of bones of axial and appendicu neuromuscular junction Joints Structural and 1	s of skin. Skeletal system, Divisions of skeletal system, types of bone, salient features ufer skeletal system, Oganization of skeletal muscle, physiology of muscle contraction, functional classification, types of pink movements and is a structure on the structure based learning, interactive class, Peer tutorial, Class using ICT tooI/PPT/white board 10 10											

UNIT III	Body fluids and blood Body fluids, composition and functions of blood, hemopoiesis, formation of hemoglobin, anemia, mechanisms of coagulation, blood grouping, RH factors, transfusion, its significance and disorders of blood. Relaticulandbheila system. Lymphatic system Lymphatic organs and tissues, lymphatic vessels, lymph circulation and functions of lymphatic system	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board	10
UNIT IV	Peripheral nervous system: Classification of peripheral nervous system: Structure and functions of sympathetic and parasympathetic nervous system. Origin and functions of spinal and cranial nerves. Special senses Structure and functions of eye, ear, nose and tongue and their disorders.	Lecture based learning, interactive class, Peer tutorial, Class using ICT looI/PPT/white board	8
UNIT V	Cardiovascular system Haart - matomy of heart, blood circulation, blood vessels, shruchre and functions of artary, vein and capillaries, elements of conduction system for heart and heart beat, its regulation by autonomic nervous system, cardiac output, cardiac orgels. Regulation of blood pressure, pulse, electrocordingma and disorders of heart.	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board	7
		Part C	

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
I	ESR determination of students	PBL	BL3-Apply	3
Ш	Blood Grouping	Experiments	BL3-Apply	2

### Part D(Marks Distribution)

			Theory		
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation
100	50	75	38	25	13
			Practical		
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation

	Part E
Books	1. Essentials of Medical Physiology by K. Sembulingam and P. Sembulingam. Jaypee brothers medical publishers, New Delhi. 2. Anatomy and Physiology in Health and Illness by Kathleen J.W. Wilson, Churchill Livingstone, New York
Articles	1. Human Physiology (vol 1 and 2) by Dr. C.C. Chatternie, Academic Publishers Kolkata
References Books	1. Physiological basis of Medical Practice-Best and Tailor. Williams & Wilkins Co, Riverview, MI USA 2. Text book of Medical Physiology- Arthur C, Guyton and John. E. Hall. Miamisburg, OH, U.S.A.
MOOC Courses	https://oii.cmu.edu/courses/anatomy-physiology-i-ii-v2-academic/
Videos	https://www.youtube.com/watch?v=3oUvqNuWzPg

	Course Articulation Matrix														
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	-	2		1	-	-	2	-	3	1	3	1	3
CO2	2	1	-	1	-	1	-	-	1	-	2	1	2	1	2
CO3	3	2	-			1	-	-	2	-	1	1	2	1	2
CO4	3	2	-	1	1	2	-	-	-	-	-	-	1	2	1
CO5	2	1	-		1	-	1	-	-	-	-	-	1	2	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



	Title of the	Course	Phorecom	utical Analysis !														
	The of the	e course	PD 40077	uuuai Anaiysis I														
L	Course	Gode	BP-102[T]															_
								Pa	rt A									
	Ve		1-1		Compation		4-4				Cradit	-	L		т	Р	С	
	Tea	ar	ist		Semester		ist				Credit	IS	3		1	0	4	
	Course	Туре	Theory on	ly		1										-		
-	Course C	ategory	Foundatio	n core														-
	Bro Bog	uisito/s									Co Bogui	sito/s						
	Theritage	usitor									oontequi	sitero						
	Course Or & Bloom	utcomes 's Level	CO1- Und CO2- To g CO3- To a CO4- To e CO5- To c	pain knowledge of so inalyze the techniqu ixplain about accura compute analytical re	s of volumetric and ele ources of errors and min es of volumetric, gravim cy, precision and signifi esults and understand th	inimizing techniques. metric and gas analy ficant figure error co the physiochemical of	sis(BL2-Onder .(BL1-Rememi ysis.(BL3-Appl incepts.(BL1-Ri concepts of ana	ber) y) emember) alysis, theories	of acids and	bases, stoich	iometry etc <b>(BL4-Analyze</b>	•)						
	Coures E	lements	Skill Deve Entrepren Employab Professso Gender X Human Va Environme	lopment ✓ eurship X ility ✓ nal Ethics X alues X ent X				SDG (Goals)		SDG4(Qu SDG8(De SDG17(Pa	ality education) sent work and economic ç artnerships for the goals)	growth)						
								Pa	tВ									
Modules				Contents								Pedagogy						Hours
UNIT 1	Pharmaceutic secondary sta hydrochloric a errors, types in medicinal a	cal Analysis- Definition and andards. Preparation and acid, sodium thiosulphate, of errors, methods of mini agents, limit tests.	I scope, Different te standardization of v sulphuric acid, pot nizing errors, accu	achniques of analysi various molar and no assium permangana racy, precision and s	s , Methods of expressi ormal solutions- Oxalic a te and ceric ammonium significant figures Pham	sing concentration Pr acid, sodium hydrox m sulphate Errors: S macopoeia, Sources	rimary and xide, Sources of s of impurities	Lecture base	ed learning, in	teractive cla	ss, Peer tutorial, Class usi	ing ICT tool/PPT/white boa	ard					10
UNIT 2	Acid base titra weak, and ve estimation of	ation: Theories of acid bas ry weak acids and bases, Sodium benzoate and Ep	e indicators, classi neutralization curve nedrine HCI	fication of acid base es Non aqueous titra	titrations and theory in ation: Solvents, acidime	nvolved in titrations o etry and alkalimetry t	of strong, titration and	Lecture base	ed learning, in	nteractive clas	is, Peer tutorial, Class usi	ing ICT tool/PPT/white boa	ard					10
UNIT 3	Precipitation t titration: Clas gluconate. Gr precipitation,	titrations: Mohr's method, sification, metal ion indica ravimetry: Principle and st Estimation of barium sulp	Volhard's, Modified ors, masking and c aps involved in grav nate. Basic Principl	ed Volhard's, Fajans method, estimation of sodium chloride. Complexometric demasking respective, seistmation of Magnesium suphate, and calcium ravimetric analysis. Purity of the precipitate: co-precipitation and post liges, methods and application of rational.									10					
UNIT 4	Concepts of o Bromometry,	oxidation and reduction, T Dichrometry, Titration with	pes of redox titration potassium iodate	ons (Principles and a	applications) Cerimetry,	y, lodimetry, lodomet	try,	Blended Lea	rning									08
UNIT 5	Electrochemii Potentiometry electrode) an and applicatio platinum elec	cal methods of analysis C y - Electrochemical cell, co d indicator electrodes (me ons. Polarography - Princi ctrode, applications	onductometry- Intro nstruction and wor tal electrodes and ( ole, Ilkovic equation	oduction, Conductivit king of reference (S glass electrode), me 1, construction and v	y cell, Conductometric tandard hydrogen, silve thods to determine end working of dropping mer	c titrations, applicatio er chloride electrode d point of potentiome ercury electrode and	ons. e and calomel etric titration rotating	Lecture base	ed learning, in	iteractive cla	ss, Peer tutorial, Class usi	ing ICT tool/PPT/white boa	ard					07
								Pa	t C									
Module	es				Title						Indicative-ABCA/F Experiments/Field Internships	PBL/ work/			Bloom's Leve	9		Hours
1		Making of differen buffer	and its titration						Experiment	ts			E	BL2-Understand			5	
							F	Part D(Marks	Distributio	n)								
								The	ory									
Total Ma	arks	Minir	num Passing Marl	ks	Ext	cternal Evaluation			Min. E	xternal Eval	uation	Internal	Evaluation	ı		Min. Internal Ev	/aluation	
100		50			75			38				25			13			
	1							Prac	tical								-	-
Total Ma	arks	Minir	Minimum Passing Marks External Evaluation Min. External Evaluation Internal Evaluation Min. Internal Evaluation Min. Internal Evaluation							valuation								
								Pa	tE									
	Boo	oks	1. A.I. Vog	el, Text Book of Qua	antitative Inorganic anal	alysis 3. P. Gundu Ra	ao, Inorganic P	harmaceutical	Chemistry 4.	Bentley and	Driver's Textbook of Pharr	maceutical Chemistry						
	Artic	cles	https://www	w.orientjchem.org/vo	ol36no1/a-review-article	e-on-pharmaceutical	l-analysis-of-ph	armaceutical-i	ndustry-accor	ding-to-pharr	nacopoeias/							
	Reference	es Books	1. John H.	- Kennedy, Analytical	chemistry principles 6.	3. Indian Pharmacop	oeia											
	MOOC C	ourses	https://note	el.ac.in/courses/104	108363												-	
	Vida	205	You tube															
L	vide		rou table,															
							,	Course Artic	ulation Matr	riv.								
COs	PO1	PO2	PO3	PO4	P05 P	P06 F	P07	PO8	PO	9	PO10	P011 P	012	PSO	1	PSO2	PSO3	
CO1	3	3	_	3	3			1	1		1.	3 1		3		2	1	

CO1	3	3	-	3	3	-	-	1	1	-	3	1	3	2	1
CO2	2	2	-	2	2	-	-	1	2	-	3	2	2	1	2
CO3	2	2	1		1	-	-	2	1	-	2	1	1	1	1
CO4	2	1	3		1	-	-	2	1	-	2	1	1	-	1
CO5	3	3	2		1	1	-	-	-	-	-	-	1	1	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



						BPha	rm							
	Title of the C	ourse	Pharmaceutics I										-	
	Course Co	de	BP-103[T]											
						Part	A							
	Year		1st	Semester	1st			Credits		L 3	т	P 0	C 4	
	Course Ty	pe	Theory only								1	1		
	Course Cate	gory	Discipline Core											
	Pre-Requis	ite/s						Co-Requisi	te/s				-	
	Course Outc & Bloom's L	omes evel	CO1- Know the histo CO2- Understand the CO3- Understand the CO4- Preparation of CO5- To formulate an	ry of profession of pharmacy ( <b>BL1-Remember</b> ) e basics of different dosage forms, pharmaceutica professional way of handling the prescription( <b>BL</b> solid and liquid dosage forms( <b>BL3-Apply</b> ) nd evaluate semi solid dosage forms( <b>BL5-Evalua</b>	l incompatibilities 2-Understand) te)	and pharmaceu	tical calculati	ons(BL2-Understand)						
	Coures Elen	ients	Skill Development ✓ Entrepreneurship X Employability X Professsonal Ethics Gender X Human Values X Environment X	x		SDG (Goals)		SDG4(Quality education) SDG8(Decent work and economic grr SDG17(Partnerships for the goals)	with)					
						Part	в							
Modules			Conte	nts					Pedagogy					Hours
UNIT 1	Historical backgr education, indus Dosage forms: In Prescription and body weight and	ound and development of prof try and organization, Pharmac troduction to dosage forms, cl Errors in prescription. Posolog body surface area	ession of pharmacy: H y as a career, Pharma lassification and definit gy: Definition, Factors a	istory of profession of Pharmacy in India in relatio copoeias: Introduction to IP, BP, USP and Extra P ions Prescription: Definition, Parts of prescription, affecting posology. Pediatric dose calculations bas	on to pharmacy harmacopoeia. , handling of sed on age,	Lecture based	learning, int	ractive class, Peer tutorial, Class using	g ICT tool/PPT/white board					10
UNIT 2	Pharmaceutical calculations: Weights and measures – Imperial & Metric system, Calculations involving percentage solutions, adjustage and disadvantages. Simple & compound powders – efficial preparations, dusting powders, efforwateges and disadvantages. Simple & compound powders – efficial preparations, dusting powders, efforwateges and disadvantages and disadvantages. Simple & compound powders – efficial preparations, dustage powders, efforwateges and disadvantages of forescent and hyproscopic powders, exterior mutures. Generative dasage forms. Solubility enhancement techniques										10			
UNIT 3	Monophasic liqu Elixirs, Liniment suspensions; Flo classification, en methods to over	ids: Definitions and preparation and Lotions. Biphasic liquids: occulated and Deflocculated su nulsifying agent, test for the ide come.	ns of Gargles, Mouthw Suspensions: Definiti Ispension & stability pr antification of type of E	ashes, Throat Paint, Eardrops, Nasal drops, Ener n, advantages and disadvantages, classifications oblems and methods to overcome. Emulsions: De mulsion, Methods of preparation & stability proble	nas, Syrups, s, Preparation of efinition, ms and	Lecture based	learning, int	ractive class, Peer tutorial, Class using	g ICT tool/PPT/white board					08
UNIT 4	Suppositories: D calculations, eva incompatibilities	efinition, types, advantages an luation of suppositories. Pharm with examples	nd disadvantages, type naceutical incompatibi	s of bases, methods of preparations. Displacementities: Definition, classification, physical, chemical	nt value & its and therapeutic	Lecture based	learning, int	ractive class, Peer tutorial, Class using	g ICT tool/PPT/white board					08
UNIT 5	Semisolid dosag ointments, paste	e forms: Definitions, classificat s, creams and gels. Excipients	tion, mechanisms and s used in semi solid do	factors influencing dermal penetration of drugs. P sage forms. Evaluation of semi solid dosages form	reparation of ns	Lecture based	learning, int	ractive class, Peer tutorial, Class using	g ICT tool/PPT/white board					07
						Part	с							
Modul	es			Title				Indicative-ABCA/P Experiments/Field v Internships	BL/ vork/		Bloom's Leve	4	ŀ	Hours
1	s	tudents will Create and formul	ate different dosage fo	rm as a part of ABL			Experiment			BL6-Create			5	
					F	Part D(Marks	Distribution	)						
						Theo	ry							
Total Ma	irks	Minimum Pa	issing Marks	External Evaluation	1		Min. Ex	ernal Evaluation	Internal Eval	uation		Min. Internal Eva	luation	
100	50			75		38			25		13			
Tot-1 M	urke	Minimum D-	ssing Marks	External Fundamenta		Practi	ual Min Fr	ormal Evaluation	Internal Fund	untion		Min Internet For	duction	
o Iotal Ma		mininum Pa	isonig marks			0	min. EX	ernar Evdluation	nternal Eval	uauoli	0	min. Internal EVa	ruduon	
L <sup>2</sup>	U			~		1			-		l °			
		1				Part	E							
Boo	oks	1. H.C. Ansel et al., Pharma Churchill Livingstone, Edinb	ceutical Dosage Form ourgh.	and Drug Delivery System, Lippincott Williams and	nd Walkins, New	Delhi. 2. Carter	S.J., Cooper	and Gunn's-Dispensing for Pharmaceu	tical Students, CBS publishers	, New Delhi. 3. M.E.	Aulton, Pharmaceut	tics, The Science& E	osage Form	n Design,
Arti	cles	https://www.mdpi.com/journa	al/pharmaceutics											
Reference	es Books	1. Lachmann. Theory and P Delhi. 4. E.A. Rawlins, Bentl	ractice of Industrial Ph ley's Text Book of Pha	armacy, Lea& Febiger Publisher, The University o maceutics, English Language Book Society, Else	er Michigan. 2. Alf vier Health Scien	onso R. Gennar ices, USA.	o Kemington.	The Science and Practice of Pharmac	y, Lippincott Williams, New De	ini. 3. Carter S.J., C	ooper and Gunn's. T	utonal Pharmacy, Cl	ss Publicati	ions, New
MOOC	ourses	nttps://nptel.ac.in/courses https://www.google.com/sea	irch?											
Vid	eos	q=pharmaceutics+articles&r 8	iz=1C1ONGR_enIN10	56IN1057&oq=&gs_lcrp=EgZjaHJvbWUqBggBEE	EUYOzIGCAAQR	Rg5MgYIARBF	GDsyBwgCE	AAYgAQyBwgDEC4YgAQyBwgEEAAY	gAQyBwgFEAAYgAQyBwgGI	EAAYgAQyBggHEE	UYPNIBCTQwOTI4a	ajBqNKgCALACAA&	sourceid=ch	hrome&ie=UTF-
1		1			(	Course Articul	ation Matri							

COs	PO1	PO2	PO3	PO4	P05	P06	P07	P08	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	-	3	2	1	-	-	-	3	2	3	2	2
CO2	3	2	3	•	•	-	•	-	-	-	-	-	3	2	1
CO3	2	2	2	-	-	1	1	2	-	3	3	-	3	1	1
CO4	2	1	1	•	•	-	•	-	-	-	2	1	3	3	
CO5	2	1	-	1	-	1	-	1	-	-	2	-	1	1	-
CO6			-	•	•	-	•	-	-	-	-	-	-	-	



				BPharm	n					
Title of the C	Course	Pharmaceutical Inorg	anic Chemistry							
Course C	ode	BP-104[T]								
				Part A						
Vor		1.01	Semester	1st		Credite	L	т	Ρ	С
Tear		151	Jenester	181		Cieurs	3	1	0	4
Course T	ype	Theory only								
Course Cat	egory	Discipline Core								
Pre-Requis	site/s					Co-Requisite/s				
Course Oute & Bloom's I	comes Level	CO1- To understand CO2- To know the so CO3- To gain knowle CO4- To understand CO5- To justify the n	the history and concept of pharmacopoeia and its purces of impurities and methods to determine the edge on limit tests of different pharmaceutical inorg the method to prepare inorganic pharmaceuticals redicinal importance of acidifiers, antacids, cathart	editions.(BL2-Understand) impurities in inorganic pharmaceutic ganic compounds.(BL1-Remember) (BL2-Understand) tics and antimicrobial agents as gast	cals. <b>(BL1-i</b> ) trointestina	Remember) Il agents (BL3-Apply)				
Coures Eler	nents	Skill Development ✓           Entreprenusnikg ×           Entreprenusnikg ×           Entrologiability ✓           Professional Elhicis ×           Gender ×           Human Values ×           Environment ×				SDC4(Quality education) SDG3(Decant work and economic growth) SDG17(Pertheratings for the goals)				
				Part B						
Modules			Contents			Pedagogy				Hours

UNIT 1	General methods of preparation, assay for the compounds superscripted with asterisk (*), properties and medicinal uses of inorganic compounds belonging to the following classes	Lecture based learning, ICT, Peer Tutorial		10
UNIT 2	Acids, Bases and Buffers Suffer equations and buffer capacity in general: buffers in pharmaceutical systems, preparation, stability, buffered isotonic solutions, measurements of tonicity, calculations and methods of adjusting isotonicity. Major extrs and intracellular electrolytes. Functions of major physiological ions, Electrolytes used in the replacement therapy. Sodium chloride, "Potassium chloride, Calcium gluconate" and Carl Rehydration Sat (CMS). Physiological acid base balance. "Dental products bentificies, role of fluoride in the treatment of dental carlies, Desensiting agents, Calcium carbonale, Sodium fluoride, and the resultance of the superior entities and the treatment of dental carlies.	Lecture based learning, ICT, Peer Tutorial		10
UNIT 3	Castrolinestinal agents Aciditers: Ammonium chicride" and Dii HQ Antacit: tiede properties of antacids, combinations of antacids, Sodum Bicarbonder: Aluminum hydroxide guik Magnestum hydroxide mitukue Cathartics: Magnesium sulphate, Sodum orthophosphate, Kaolin and Bentonite Antimicrobalis: Mechanism, classification, Potassium permanganate, Boric acid, Hydrogen percodaré, Cholmatel Imrél: Joline and Is preparations	Lecture based learning, ICT, Peer Tutorial		10
UNIT 4	Miscellaneous compounde Expectorants: Potassium iodiie, Armonium chioride", Emetics: Copper subplate", Sodium potassium tartarate Haematinics: Ferrous subplate ", Ferrous guocnate Poison and Antidote: Sodium thiosubplate", Activated charcoal, Sodium nitrita333 Astingeris: Zin: Subplate, Potash Aum	Lecture based learning, ICT, Peer Tutorial		08
UNIT 5	Radiopharmaceuticals: Radio activity, Measurement of radioactivity, Properties of α, β, γ radiations, Half-life, radio isotopes and study of radio isotopes - Sodium iodide 1131, Storage conditions, precautions & pharmaceutical application of radioactive substances.	Lecture based learning, ICT, Peer Tutorial		07
	Part	с		
Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Limit test finding in water of ITM premises sample	Experiments	4	

1	Limit test finding in water of ITM premises sample

### Part D(Marks Distribution)

	Theory								
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation				
100	50	75	38	25	13				
			Practical						
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation				
0	0	0	0	0	0				

	Part E
Books	1. A.I. Vogel, Text Book of Quantitative Inorganic analysis 2. P. Gundu Rao, Inorganic Pharmaceutical Chemistry, 3rd Edition 3. M.L. Schroff, Inorganic Pharmaceutical Chemistry 4. Bentley and Driver's Textbook of Pharmaceutical Chemistry 5. Anand & Chatwal, Inorganic Pharmaceutical Chemistry 4. Bentley and Driver's Textbook of Pharmaceutical Chemistry 5. Anand & Chatwal, Inorganic Pharmaceutical Chemistry 4. Bentley and Driver's Textbook of Pharmaceutical Chemistry 5. Anand & Chatwal, Inorganic Pharmaceutical Chemistry 4. Bentley and Driver's Textbook of Pharmaceutical Chemistry 5. Anand & Chatwal, Inorganic Pharmaceutical Chemistry 4. Bentley and Driver's Textbook of Pharmaceutical Chemistry 5. Anand & Chatwal, Inorganic Pharmaceutical Chemistry 4. Bentley and Driver's Textbook of Pharmaceutical Chemistry 5. Anand & Chatwal, Inorganic Pharmaceutical Chemistry 4. Bentley and Driver's Textbook of Pharmaceutical Chemistry 5. Anand & Chatwal, Inorganic Pharmaceutical Chemistry 4. Bentley and Driver's Textbook of Pharmaceutical Chemistry 5. Anand & Chatwal, Inorganic Pharmaceutical Chemistry 4. Bentley and Driver's Textbook of Pharmaceutical Chemistry 5. Anand & Chatwal, Inorganic Pharmaceutical Chemistry
Articles	NA
References Books	1. Indian Pharmacopoeia
MOOC Courses	https://tptel.ac.in/courses
Videos	You tube

							0-		Madain						
COs	PO1	PO2	P03	PO4	P05	P06	P07	PO8	PO9	PO10	P011	P012	PSO1	PSO2	PSO3
CO1	3	2	1	-	2	1	2	1	3	-	3	-	3	3	-
CO2	3	2	1	2	2	1	1	1	2	-	3	-	2	3	1
CO3	2	2	1	1	2	2	1	1	2	-	3	1	1	2	-
CO4	2	2	1	1	2	1	1	1	1	-	2	-	1	1	-
CO5	3	1	2	1	3	1	2	1	1	-	2	3	1	2	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



	BPharm									
	Title of the Course	Communication Skills	5*							
	Course Code	BP-105[T]								
	Part A									
	Vear	1 et	Semester	1et		Credits	L	т	Ρ	С
	i cui	104		150		orcato	2	0	0	2
	Course Type	Theory only								
	Course Category	Non-graded Core Re	quirement							
	Pre-Requisite/s					Co-Requisite/s				
	C01-To understand the behavioral needs for a pharmacist to function effectively in the areas of pharmaceutical operation.(BL2-Understand) CO2-Communicate effectively (Netal Asophy) CO3-Electively manage the team as a team player(BL2-Understand) CO4-To develop interview skills(BL3-Apply) CO5-To develop calcerstrip qualities and essentials (BL5-Create)									
	Skill Development ✓ Entrepreneurship × Employability ✓ Professional Ethics × Gender × Human Values × Environment X					SDC4(Quality education) SDC8(Devent work and accoromic growth) SDC9(7(Partnerships for the goals)				
					Part B					
Modules		Cor	itents			Pedagog	1			Hours
UNIT 1	Communication Skills: Introduction, Definition Encoding, Channel, Decoding, Receiver, Fe Cultural Barriers, Language Barriers, Gende in Communication: Introduction, Visual Perc Feelings, Environment	n, The Importance of C edback, Context Barrie r Barriers, Interperson eption, Language, Oth	Communication, The Communication Process – Sc rs to communication: Physiological Barriers, Phys al Barriers, Psychological Barriers, Emotional barri ar factors affecting our perspective - Past Experier	urce, Message, ical Barriers, ers Perspectives ices, Prejudices,	Lecture based Learning,	interactive classroom,				07
UNIT 2	Elements of Communication: Introduction, F Verbal Communication, Physical Communic for each -Direct Communication Style, Spirit Style	ace to Face Communic ation Communication S ed Communication Sty	cation - Tone of Voice, Body Language (Non-verba Styles: Introduction, The Communication Styles Ma le, Systematic Communication Style, Considerate	I communication), atrix with example Communication	Lecture based Learning,	interactive classroom, Discussion				07
UNIT 3	Basic Listening Skills: Introduction, Self-Awa Effective Written Communication: Introduction of Discussion' Required, Shades of Meaning Your Audience, Organization of the Message	areness, Active Listenin on, When and When No I, Formal Communicati	g, Becoming an Active Listener, Listening in Diffic to Use Written Communication - Complexity of t on Writing Effectively: Subject Lines, Put the Main	ult Situations he Topic, Amount Point First, Know	Lecture based Learning,	interactive classroom, Discussion				07
UNIT 4	Interview Skills: Purpose of an interview, Do Presentation, Structuring Your Presentation,	's and Dont's of an inte Delivering Your Prese	rview Giving Presentations: Dealing with Fears, pl ntation, Techniques of Delivery	anning your	Lecture based Learning,	interactive classroom, Discussion				05
UNIT 5	Group Discussion: Introduction, Communic	ation skills in group dis	cussion, Do's and Dont's of group discussion		Lecture based Learning,	interactive classroom, Discussion, ABL (Mooc HR Round)				05

			Part	с					
Modules		Title		Indicative-ABCA/ Experiments/Field Internships		Bloom's Level	Hours		
1	How to pitch yourself for HR Round			Seminar		BL5-Evaluate		10	
	Part D(Marks Distribution)								
			Theo	ry					
Total Marks	Minimum Passing Marks	External Evaluation		Min. External Evaluation	Internal Evaluation	n	Min. Internal Eva	aluation	
50	25	35	18		15		8		
			Practi	cal					
Total Marks	Minimum Passing Marks	External Evaluation		Min. External Evaluation	Internal Evaluation	n	Min. Internal Eva	aluation	

	Part E
Books	1: Basic communication skills for Technology, Andreja. J. Ruther Ford, 2nd Edition, Pearson Education, 2011 2. Communication skills, Sanjay Kumar, Pushpalata, 1stEdition, Oxford Press, 2011 3. Organizational Behaviour, Stephen .P. Robbins, 1stEdition, Pearson, 2013 4. Brilliant- Communication skills, Gill Hasson, 1stEdition, Pearson Life, 2011 5. The Ace of Soft Skills: Attitude, Communication and Eliquette for success, Gopala Swamy Ramesh, 5thEdition, Pearson, 2013
Articles	https://www.helpguide.org/articles/telationships-communication/effective-communication.htm
References Books	1. Developing your influencing skills, Debonah Dalley, Lois Burton, Margaret, Green Hall, 14 Edition Universe of Learning LTD, 2010; Communication skills for professionals. Ronar rinz, AntEdition, New arrivals — PHI, 2011. A Personality development and soft skills. Barun K Marra, 1stEdition, Oxford Press, 2011; 45:01: 45:0
MOOC Courses	https://nptel.ac.in/courses/102104061
Videos	https://www.youtube.com/watch?n=yRwgIZSaR_Y

							Co	urse Articulation	Matrix						
COs	PO1	PO2	PO3	PO4	P05	PO6	P07	P08	PO9	PO10	P011	P012	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	3	-	1	-	-	3	3	-	1	3
CO2	-	-	-	-		2	1	1	-	-	2	2	-	1	3
CO3	-	1	-	-	-	1	-	1	-	-	2	2	-	1	3
CO4	-	-	-	1		2	1	1	-	-	2	3	-	1	3
CO5	-	-	-	-	-	-	1	1	-	-	1	2	-	1	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



	BPharm															
	Title of	the Course	Remedia	al Mathematics *												
	Cour	se Code	BP-106F	RM[T]												
								P	art A							
											0		L	т	P	с
		rear	ist		Semester	r	2 0 0						0	2		
	Cou	se Type	Theory	only						·						
	Course	Category	Non-gra	ded Core Requiremen	t											
	Pre-R	equisite/s									Co-Requis	ite/s				
	Course & Bloc	Outcomes m's Level	CO1- To CO2- Si CO3- Aj CO4- To CO5- Aj	o understand the role of olve the different types opreciate the importan of adopt both conventio opply a range of techniq	f mathematics in pha of problems by appl application of mathe al and creative tech ues effectively to sol	armacy(BL1-Remer lying theory(BL2-Un ematics in Pharmac iniques to the solution live problems includi	nber) derstand) y(BL4-Analyze) ons of mathematica ng theory deductio	al problems. n, approxim	.(BL4-Analyze) nation and simu	) lation(BL3-Ap)	ply)					
	Coures	Elements	Skill Der Entrepro Employa Profess Gender Human Environ	velopment ✓ aneurship × ability ✓ sonal Ethics × × Values × ment ×	s	DG (Goals)	G (Goals) SDG4(Quality education) SDG8(Cean water and sanitation) SDG8(Decent work and economic growth)									
-	Part B															
Modules         Contents         Hours         Hours           A module         Contents         Modules         Modules         Hours											Hours					
UNIT 1		Partial fraction Introductio fraction, Application of Pa Theorems/Properties of k solve pharmaceutical pro Introduction, Limit of a fu	n, Polynomial, Ratio tial Fraction in Che garithms, Common lems. Function: Re lotion, Definition of	onal fractions, Proper a mical Kinetics and Pha logarithms, Character al Valued function, Cla limit of a function (def	nd Improper fractior irmacokinetics Loga istic and Mantissa, v ssification of real va nition)	ns, Partial fraction, F rithms Introduction, vorked examples, ap lued functions, Limit	Resolving into Part Definition, oplication of logarit s and continuity :	tial hm to	Lecture based	learning, Peer	Tutorial					06
UNIT 2	Matrices and Determinant: Introduction matrices, Types of matrices, Operation on matrices, Transpose of a matrix, Matrix Multiplication, Determinants, Properties of determinants, Minora and C-F Actors, Agoint or adjugate of a square matrix, Singular and non-singular matrix, Solution of system of linear of equations using matrix method. Cramer's rule, Characteristic equation and roots of a square matrix, Cayley-Hamilton theorem, Application of Matrices in solving Pharmacolineic equations using matrix method.								06							
Calculus Differentiation : Introductions, Derivative of a function, Derivative of a constant, Derivative of a product of a constant and a function, Derivative of the survivative of the product of two functions, Derivative of the product of two functions (Suderstift circula) – Whitten Y = 000 (Suderstift circula) – Suderstite of the survivative of the survivativativativative of the survivativativativativativativativativativa								06								
UNIT 4		Analytical Geometry Intro Conditions for parallelism Integration: Introduction, Integration by parts, defin	luction: Signs of the and perpendicularit lefinition, Standard te integrals, applica	e Coordinates, Distanc ty of two lines, Slope o formulae, Rules of intr ation	e formula, Straight L a line joining two po gration, Method of s	ine: Slope or gradie pints, Slope – interor substitution, Method	nt of a straight line opt form of a straig of Partial fractions	t,  ht line  ,	lecture based l	earning						06
UNIT 5		Differential Equations: So Differential equations, Ex Properties of Laplace tran derivatives, Application to	ne basic definitions ct equations, Appli sform, Laplace Trai solve Linear differe	, Order and degree, E cation in solving Pharm nsforms of elementary ntial equations, Applic	quations in separabl lacokinetic equation functions, Inverse La ation in solving Cher	e form, Homogeneo s Laplace Transform aplace transforms, L nical kinetics and Pt	us equations, Line 1: Introduction, Def aplace transform of narmacokinetics eq	ar finition, of quations	lecture based l	earning						06
								Pa	art C							
Modul	les				Title						Indicative-ABCA/ Experiments/Field Internships	PBL/ work/		Bloom's L	evel	Hours
1		Laplace Transform							Experimen	ts			BL3-Ap	ply		4
							Pa	art D(Mark	ks Distributio	n)						
								TH	heory							
Total Ma	arks	Mi	imum Passing Ma	arks	E	External Evaluation	1		Min. E	xternal Evalua	ation	Inter	nal Evaluation		Min. Internal Evalu	uation
50		25			35			18				15		8		
					1			Pra	actical							
Total Ma	arks	Mi	imum Passing Ma	arks	E	External Evaluation	1		Min. E	xternal Evalua	ation	Interr	nal Evaluation		Min. Internal Evalu	uation
U		U			U			U				U		0		
								P	art E							
	В	ooks	1. Differ	ential Calculus by Sha	nthinarayan 2. Pharr	maceutical Mathema	atics with application	on to Pharma	acy by Panchal	ksharappa Gov	wda D.H.					
	A	ticles	NA													
	References Books 1. Integral Calculus by Shanthinarayan 2. Higher Engineering Mathem						atics by Dr. B.S.Gr	ewal								
	MOOD	Courses	https://nj	ptel.ac.in/courses/102	01067 https://www.u	udemy.com/course/r	nath-fundamentals	s-complete-c	course-on-funda	amentals-						
	v	deos	https://w	ww.youtube.com/watc	n?v=d77qWQA4IIw8	list=PL7qxHCXS2	ZmafOUewEGxTK	sc7brHKti_								
							С	ourse Artic	culation Matr	ix						
COs	PO1	PO2	P03	PO4	P05	P06	P07	PO8	POS	9	PO10	P011	P012	PSO1	PSO2	PSO3
CO1	-	2	1	1	1	-	-	-	-		-	2	-	-	1	1
CO2	-	3	1	-	1	-	-	-	-		-	1	-	-	1	-
CO3	-	2	1	-	1	-	-	-	-		-	1	-	-	1	1
CO4	1	2	1	1	1	-	-	-	-		-	1	-	-	-	1
CO5	· 2 · 2 · · 2 · · ·		-	-		-	2	-	-	-	1					
CO6	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-



Title of the Course	Human anatomy and Physiology							
Course Code	BP-107[P]							-
			Part A					
Vor	1 ct	Samastar	1et	Cradita	L	т	Ρ	С
iea.	150	Sellester	151	Ciedita	0	0	2	2
Course Type	Lab only		•					
Course Category	Foundation core							
Pre-Requisite/s				Co-Requisite/s				-
Course Outcomes & Bloom's Level	CO1- To recall handli CO2- To summarize CO3- To identify the I CO4- To analyze the CO5- To estimate the	ng of compound microscope and to memorize var the characteristics of different bones (skeletal syst bleeding/clotting time and blood group( <b>BL2-Unde</b> blood cells using heamocytometry( <b>BL4-Analyze</b> ) a ESR, HR, PR, hemoglobin concentration of hum	rious animal tissues.(BL1-Remember) tem)(BL2-Understand) rstand) an blood and blood pressure(BL5-Evaluate)					
Coures Elements	Skill Development ✓ Entrepreneurship X Employability X Professsonal Ethics 3 Gender X Human Values X Environment X	×	SDG (Goals)	SDG4(Quality education) SDG8(Decent work and economic growth)				

## Part B

Contents

Modules

	Pa	rt C		
Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	1. Study of compound microscope. 2. Microscopic study of epithelial and connective tissue	Experiments	BL2-Understand	4
2	3. Microscopic study of muscular and nervous tissue 4. Identification of axial bones	Experiments	BL3-Apply	4
3	5. Identification of appendicular bones 6. Introduction to hemocytometry	Experiments	BL4-Analyze	4
4	7. Enumeration of white blood cell (WBC) count 8. Enumeration of total red blood corpuscles (RBC) count	Experiments	BL5-Evaluate	4
5	9. Determination of bleeding time 10. Determination of clotting time	Experiments	BL4-Analyze	4
6	11. Estimation of hemoglobin content 12. Determination of blood group.	Experiments	BL3-Apply	4
7	13. Determination of erythrocyte sedimentation rate (ESR). 14. Determination of heart rate and pulse rate. 15. Recording of blood pressure.	Experiments	BL3-Apply	4

Pedagogy

Hours

#### Part D(Marks Distribution) Theory Min. External Evaluation Total Marks Minimum Passing Marks External Evaluation Internal Evaluation Min. Internal Evaluation Practical Min. External Evaluation Total Marks External Evaluation Internal Evaluation Min. Internal Evaluation Minimum Passing Marks 35 15 25 8 18

	Part E
Books	1. Textbook of Practical Physiology by C.L. Ghai, Jaypee brother's medical publishers, New Delhi. 2. Practical workbook of Human Physiology by K. Srinageswari and Rajeev Sharma, Jaypee brother's medical publishers, New Delhi.
Articles	NA
References Books	1. Physiological basis of Medical Practice-Best and Taker. Williams & Wilkins Co. Riverview, MI USA 2. Text book of Medical Physiology-Arthur C, Guyton and John E. Hall. Miamiaburg, OH, U.S.A. 3. Principles of Anatomy and Physiology by Tortora Grabowski. Palmetto, CA, U.S.A.
MOOC Courses	https://www.udemy.com/course/anatomy-and-physiology-c/?couponCode=NVDPRODIN35 https://www.cofordcollege.ac/product/anatomy-and-physiology-short-course/#text=The%20course%20wil%20take%20a.systems%20in%20a&/systems%20in%20take%20a.systems%20in%20take%20a.systems%20in%20take%20a.systems%20in%20take%
Videos	https://www.khanacademy.org/search?referer=%2F&page_search_query=HUMAN+ANATOMY+AND+PHYSIOLOGY

							Co	ourse Articulation	Matrix						
COs	PO1	PO2	P03	PO4	PO5	P06	PO7	P08	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	1	2	-	-	-	-	-	3	-	3	-	2
CO2	3	-			1		-	1	-	-	3	-	2	1	3
CO3	3	1	-	1	1	-	-	-	-	-	3	-	3	-	2
CO4	1	-	-	-	2	-	-	1	-	-	3	-	1	-	1
CO5	1	1	•	•	1	1	-	-	-	-	3	-	2	-	1
CO6							-	-	-			-			



Title of the Course	Pharmaceutical Anal	utical Analysis I										
Course Code	BP-108[P]											
		Part A										
Voar	1st	Somester	1 st	Cradita	L	т	Ρ	с				
1601	151	Sellester	Ciedita	0	0	2	2					
Course Type	Lab only											
Course Category	Discipline Core	apline Core										
Pre-Requisite/s				Co-Requisite/s								
Course Outcomes & Bloom's Level	CO1- To understand CO2- To demonstrat CO3- To experiment CO4- To analyze gra CO5- To evaluate ph	I the importance of calibration, calibration of weigh te standardization of solutions with different streng with volumetric analysis such as acidimetry and a simetric analytical techniques( <b>BL4-Analyze</b> ) narmaceuticals by colorimetry and electrochemical	ts, pipette and burette.( <b>BL2-Understand</b> ) ths( <b>BL3-Apply</b> ) Ikalimetry, oxidation and reduction reactions, i methods( <b>BL5-Evaluate</b> )	odometry, complexometry, precipitation and non-aqueous titration(BI	_4-Analyze)							
Coures Elements	Skill Development ✓ Entrgreeneurship × Employability × Professional Ethics × Gender × Human Values × Environment ×			SDG4(Quality education) SDG8(Decent work and economic growth)								

### Contents

Modules

	Part	C		
Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Limit Test of the following (1) Chloride (2) Sulphate (3) Iron (4) Arsenic	Experiments	BL4-Analyze	12
2	Preparation and standardization of (1) Sodium hydroxide (2) Sulphuric acid (3) Sodium thiosulfate (4) Potassium permanganate (5) Ceric ammonium sulphate	Experiments	BL6-Create	10
3	Assay of the following compounds along with Standardization of Timant (1) Ammonium chloride by acit base titration (2) Ferrous subhate by Certimetry (3) Copper subhate by lodometry (4) Calcium gluconate by complexometry (5) Hydrogen perioxide by Permanganometry (6) Sodium beroade by non-aqueous titration (7) Sodium Chloride by precipitation titration	Experiments	BL5-Evaluate	12
4	Determination of Normality by electro-analytical methods (1) Conductometric titration of strong acid against strong base (2) Conductometric titration of strong acid and weak acid against strong base (3) Potentiometric titration of strong acid against strong base	Experiments	BL5-Evaluate	12

Part B

Pedagogy

Hours

		F	Part D(Marks Distribution)									
	Theory											
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation							
			Practical									
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation							
50	25	35	18	15	8							

	Part E
Books	1. A.H. Beckett & J.B. Stenlake's, Practical Pharmaceutical Chemistry Vol I & II, Stahlone Press of University of London 2. A.I. Vogel, Text Book of Quantitative Inorganic analysis 3. P. Gundu Rao, Inorganic Pharmaceutical Chemistry
Articles	
References Books	4. Bentley and Driver's Textbook of Pharmaceutical Chemistry 5. John H. Kennedy, Analytical chemistry principles 6. Indian Pharmacopoeia
MOOC Courses	NA
Videos	NA

							Co	urse Articulation	Matrix						
COs	P01	PO2	PO3	PO4	P05	P06	P07	P08	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	-	1	1	-	-	-	-	-	3	-	3	-	2
CO2	3	2	1	-	1	-	-	-	-	-	3	-	3	-	1
CO3	2	3	3	2	-	-	-	-	-	-	2	-	2	-	1
CO4	2	2	2	-	1	-	-	-	-	-	2	-	1	1	1
CO5	2	3	1	1	-	-	-	-	-	-	3	-	1	-	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



			BPharm					
Title of the Course	Pharmaceutics I							
Course Code	BP-109[P]							-
			Part A					
Your	1 et	Somostor	1et	Cradita	L	т	Р	с
i ear	151	Sellester	151	Ciedita	0	0	4	4
Course Type	Lab only		•	·				
Course Category	egory Discipline Core							
Pre-Requisite/s				Co-Requisite/s				
Course Outcomes & Bloom's Level	CO1- To recall the pr CO2- Understand the CO3- To experiment CO4- To formulate Bi CO5- To formulate set	inciples used in the preparation of solid, liquid and p professional way of handling the prescription(BL with solid and monophasic liquid dosage forms for phasic liquid dosage form and their evaluation(BL amisolid dosage form and their evaluation(BL3-Ap	I semi solid dosage forms(BL1-Remember) 2-Understand) r internal and external administration.(BL3-Ap 5-Evaluate) pply)	ply)				
Coures Elements	Skill Development ✓ Entrepreneurship X Employability X Professsonal Ethics : Gender X Human Values X Environment X	×	SDG (Goals)	SDG4(Quality education) SDG8(Decent work and economic growth)				

### Modules <4d style="border: 1px solid black;">Experiments

	Par	tC		
Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Syrups a) Syrup IP'66 b) Compound syrup of Ferrous Phosphate BPC'68	Experiments	BL3-Apply	4
2	Elixirs a) Piperazine citrate elixir b) Paracetamol pediatric elixir	Experiments	BL6-Create	4
3	Linctus a) Terpin Hydrate Linctus IP'66 b) Iodine Throat Paint (Mandles Paint)	Experiments	BL3-Apply	4
4	Solutions a) Strong solution of ammonium acetate b) Cresol with soap solution c) Lugol's solution	Experiments	BL5-Evaluate	4
5	Suspensions a) Calamine lotion b) Magnesium Hydroxide mixture c) Aluminimum Hydroxide gel	Experiments	BL3-Apply	4
6	Emulsions a) Turpentine Liniment b) Liquid paraffin emulsion	Experiments	BL6-Create	4
7	Suppositories a) Glycero gelatin suppository b) Coca butter suppository c) Zinc Oxide suppository	Experiments	BL6-Create	4
8	Semisolids a) Sulphur ointment b) Non staining-iodine ointment with methyl salicylate c) Carbopal gel	BL6-Create	4	

Part B

Pedagogy

Hours

Contents

		F	Part D(Marks Distribution)									
	Theory											
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation							
			Practical									
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation							
50	25	35	18	15	8							

	Part E
Books	1. H.C. Ansel et al., Pharmaceutical Dosage Form and Drug Delivery System, Lippincott Williams and Walkins, New Delhi. 2. Carter S.J., Cooper and Gunn's-Dispensing for Pharmaceutical Students, CBS publishers, New Delhi. 3. M.E. Auton, Pharmaceutics, The Science& Dosage Form Design, Churchill Livingstone, Edinburgh.
Articles	NA
References Books	4. Indian pharmacopoeia. 5. British pharmacopoeia. 6. Lachmann. Theory and Practice of Industrial Pharmacy, Lea& Febiger Publisher, The University of Michigan. 7. Alfonso R. Gennaro Remington. The Science and Practice of Pharmacy, Lippincott Williams, New Delhi.
MOOC Courses	https://www.coursera.org/courses?query=pharmaceutical
Videos	https://www.youtube.com/watch?v=a075iAg4NWg&iist=PLyfe0MKpikdUh1hi0yS5tpGEVCtMLv51S

							Co	ourse Articulation	Matrix						
COs	PO1	PO2	P03	PO4	P05	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	3	1	2	-	-	-	1	2	3	1	3	-	3
CO2	3	2	3	2	-	-	-	-	-	1	3	3	2	-	2
CO3	2	2	3		1	-	-	-	1	1	3	2	3	-	2
CO4	3	1	3	3	1	-	-	-	-	-	2	-	3	-	2
CO5	2	1	3	2	1	1	-	-	2	2	1	1	-	-	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



			BPharm					
Title of the Course	Pharmaceutical Inorg	ganic Chemistry						
Course Code	BP-110[P]							
			Part A					
Vor	1st	Somostor	1et	Credite	L	т	Ρ	с
i ear	151	Sellester	151	Ciedita	0	0	2	2
Course Type	Lab only							
Course Category	Discipline Core							
Pre-Requisite/s		Co-Requisite/s						
Course Outcomes & Bloom's Level	CO1- To recall the so CO2- Understand the CO3- To demonstrat CO4- To analyze var CO5- To select suita	Jurces of limit tests, preparation and identification of e medicinal and pharmaceutical importance of inor le the preparation of inorganic pharmaceuticals. (BL rious inorganic pharmaceutical compounds and per able method for the preparation of inorganic pharma	of compounds( <b>BL1-Remember</b> ) ganic compounds( <b>BL2-Understand</b> ) L3-Apply) from limit test( <b>BL4-Analyze</b> ) aceuticals( <b>BL4-Analyze</b> )					
Coures Elements	Skill Development ✓ Entrepreneurship X Employability ✓ Professsonal Ethics Gender X Human Values X Environment ✓	x	SDG (Goals)	SDG4(Quality education) SDG6(Clean water and sanitation) SDG8(Decent work and economic growth)				

## Part B

Contents

Modules

		Par	C		
	Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
	1	Limit tests for following ions Limit test for Chlorides and Sulphates, Modified limit test for Chlorides and Sulphates, Limit test for Iron, Limit test for Heavy metals, Limit test for Lead, Limit test for Arsenic	Experiments	BL4-Analyze	10
ſ	2	Identification test Magnesium hydroxide Ferrous sulphate Sodium bicarbonate Calcium gluconate Copper sulphate	Experiments	BL4-Analyze	10
	3	Test for purity Swelling power of Bentonite, Neutralizing capacity of aluminum hydroxide gel, Determination of potassium iodate and iodine in potassium lodide	Experiments	BL3-Apply	10
ſ	4	Preparation of inorganic pharmaceuticals. Boric acid, Potash alum, Ferrous sulphate	Experiments	BL6-Create	8

Part D(Marks Distribution)

Pedagogy

Hours

				Theory									
Total Marks	Total Marks         Minimum Passing Marks         External Evaluation         Internal Evaluation         Minimum Passing Marks           Total Marks         Minimum Passing Marks         Factoral Evaluation         Minimum Passing Marks         Mi												
				Practical									
Total Marks	Minimum Pa	assing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation							
50	25		35	18	15	8							
				Part E									
Boo	oks	1. A.H. Beckett & J.B. Stenlake's	a, Practical Pharmaceutical Chemistry Vol I & II, Stahlor	e Press of University of London, 4th edition. 2. A.I. Vogel, Text Bool	k of Quantitative Inorganic analysis								
Artic	cles	https://asianjpr.com/HTMLPaper.	aspx?Journal=Asian%20Journal%20of%20Pharmaceu	tical%20Research;PID=2017-7-1-6									
Reference	es Books	6. Anand & Chatwal, Inorganic P	harmaceutical Chemistry 7. Indian Pharmacopoeia										
MOOC	MOOC Courses NA												
Vide	905	https://www.youtube.com/watch?	v=3ut36CX-YN0&list=PLQnNyE1lxfVL4np_23Y2f18QV	elWUHvQM									

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	P06	P07	PO8	PO9	PO10	PO11	P012	PSO1	PSO2	PSO3
CO1	3	2	•	2	1	-	-	-	2	2	2	-	2	-	3
CO2	2	1	1	3	2	-	-	-	1	1	3	-	2	-	1
CO3	3	2	1	1	2	-	-	-	-	-	3	-	3	1	2
CO4	3	2	1	3	2	-	-	-	1	-	2	-	1	1	1
CO5	3	3	-	1	1	-	-	-	-	1	2	-	3	-	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



			BPharm					
Title of the Course	Communication Skills							
Course Code	BP-111[P]							
			Part A					
Yoar	1 et	Somester	1	Cradita	L	т	Ρ	с
i eai	150	Semester	101	Ciedita	0	0	1	1
Course Type	Soft skill						•	
Course Category	Non-graded Core Req	uirement						
Pre-Requisite/s				Co-Requisite/s				
Course Outcomes & Bloom's Level	CO1- Understand the I CO2- To apply the prac CO3- To take part in at CO4- To develop the in CO5- To improve in err	behavioral needs for a pharmacist to function effectively ctical skills to Communicate effectively (Verbal and Non- dvanced learning on comprehension/direct and indirect a terview handling skills.(BLS-Evaluate) nail etiquette.(BL3-Apply)	in the areas of pharmaceutical operation( <b>BL2-Und</b> Verbal)( <b>BL3-Apply</b> ) speech.( <b>BL4-Analyze</b> )	erstand)				
Coures Elements	Skill Development ✓ Entrepreneurship X Employability ✓ Professsonal Ethics X Gender X Human Values X Environment X		SDG (Goals)	SDG3(Good health and well-being) SDG4(Quality education)				

	Pa	rt C		
Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Basic communication covering the following topics Meeting People Asking Questions Making Friends What did you do? Do's and Dont's	Role Play	BL3-Apply	2/ WEEK
2	Advanced Learning Listening Comprehension / Direct and Indirect Speech Figures of Speech Effective Communication Writing Skills Effective Writing Interview Handling Skills E-Mail etiquette Presentation Skills	Experiments	BL3-Apply	2/ WEEK
3	Pronunciations covering the following topics Pronunciation (Consonant Sounds) Pronunciation and Nouns Pronunciation (Vowel	Experiments	BL3-Apply	2/ WEEK

Part B

Pedagogy

Hours

Contents

Modules

	Part D(Marks Distribution)													
	Theory													
Total Marks	Total Marks         Minimum Passing Marks         External Evaluation         Internal Evaluation         Min. Internal Evaluation													
			Practical											
Total Marks	Total Marks Ninimum Passing Warks External Evaluation Nin. External Evaluation Internal Evaluation Min. Internal Evaluation													
25	13 15 16 8 10 10 5													

	Part E
Books	1. Basic communication skills for Technology, Andreja. J. Ruther Ford, 2nd Edition, Pearson Education, 2011 2. Communication skills, Sanjay Kumar, Pushpalata, 1stEdition, Oxford Press, 2011 3. Organizational Behaviour, Stephen .P. Robbins, 1stEdition, Pearson, 2013
Articles	9. Soft skill for everyone, Butter Field, 1st Edition, Cengage Learning India PvL Ltd, 2011
References Books	4. Brilliant-Communication skills, Gill Hasson, 118Edition, Pearson Life, 2011 5. The Ace of Soft Skills: Attitude, Communication and Eliquette for success, Gopala Swamy Ramesh, ShEdition, Pearson, 2013 6. Developing your influencing skills. Deborah Dalley, Lois Burton, Margaret, Green Mall, 115 Edition Universe of Learning Life, 2011 5. 2010
MOOC Courses	https://www.coursera.org/specializations/improve-english
Videos	https://www.youtube.com/watch?v=sm5jgr9TZo

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	P011	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	3	-	-	1	3	3	1	3	1	1
CO2	-	-	-	-	-	2	-	1	-	3	2	1	2	1	1
CO3	-	-	-	-	-	2	-	1	1	2	2	3	2	2	1
CO4	-	-	-	-	-	1	-	-	1	2	2	2	2	2	1
CO5	-	-	•	-	-	1	-	-	1	1	2	1	2	1	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



									BPharm								
	Title of the	Course		Fine art and Music-	•												
	Course C	ode		BP-113[T]													
									Port A								
									TaitA				L	т	Р	С	
	Year			1st		Semester		1st			Crec	lits	1	0	0	1	
	Course 1	ype		Theory only											-		
	Course Cat	tegory		Generic Elective													
	Pre-Requi	site/s									Co-Requ	iisite/s					
	Course Out & Bloom's	comes Level		CO1- Drawing exe variety of visual ex	cises are to periences(Bl	learn accurate obse L3-Apply)	rvation and skills o	f graphic presentati	on in free hand drawin	g exercises fror	n objects and nature to st	udy proportion, volume and	d visual perspective, si	uggestion of solidity by li	ne, mass, va	lue and texture; emph	asis on
	Coures Ele	ments		Skill Development Entrepreneurship Employability ✓ Professsonal Ethic Gender X Human Values X Environment X	√ ′ 5 X			s	DG (Goals)	SDG8(D SDG17(	ecent work and economic Partnerships for the goals	growth) )					
									Part B						-		
	Modules					Conte	ents					Pedago	рду			Hours	
1			)Study of proportion, line, colour, form, tone, texture and graphic representation Nature Drawing: study of various natural forms							Lectur	e based learning				10		
2			Nature Drawing: study of various natural forms. Drawing from various man-made objects.							class	out of classroom				08		
3	Drawing from various man-made objects.							class out of classroom 07									
4			d)Drawing from memory- to develop the sense of observation and the capacity to retain and recall images and their co-ordin							. active learning							
1		Part							Part C	Part C							1
			Modu	Iles						Indicative-ABCA/PBL/ Title Experiments/Field work/ Bloom's L Internships							Hours
Nature drawings:1	Drawing from ma	in-made object:	1 Drawing from	Memory-1 Free-han	d sketching:	5	No.	of assignments: 2						PBL		BL3-Apply	10
								Pa	rt D(Marks Distribu	tion)							
Tatal M	and an		Minimum D	anian Marka			uternal Evaluatio	-	Theory	Future I Fue	lundin -	Interne	I Fueluation		Min Inter	and Freelandian	
Total Ma	aika		Minimum Po	assing marks		-	xternal Evaluatio			. External Eva	luation	interna	Evaluation		Mill. Inter	nai Evaluation	
									Practical								
Total Ma	arks		Minimum Pa	assing Marks		E	xternal Evaluatio	n	Mir	. External Eva	luation	Interna	I Evaluation		Min. Inter	nal Evaluation	
0	C	)				0			0			0		0			
									Part F								
	Book	5		Color and Light A	Guide for the	Realist Painter (Vol	lume 2) (James Gi	irney Art)									
	Article	5		https://shepherd.co	m/best-book	s/art-references-for-	drawing-the-huma	n-figure									
	References	Books		Let's Draw! Illustrat	ing With Cop	ic Book by Ran; KA	OPPE; Kirishima M	futsuki (shelved 1 ti	me as drawing-referen	ce)							
	MOOC Co	urses		https://www.nifafine	arts.com/cou	urse.php?id=29											
	Video	Videos https://www.youtube.com/results?search_query=drawing															
c0-	801	802	000	DC 1		POF	DOC	Co	ourse Articulation N	atrix	0010	0011	2012	0001	DCO2	DECO	
CO1	101	P02	1	-04		100	- 00	101	1.00	- 00	1010	2	-012	-301	- 302	PaU3	
002	1		-	-		-	-	1	-		-	-		-	-	-	
C03	-	1		-			-	l.				<u> </u>		-	-		
CO4	-	1		-		-	-	l.	-			1.		-	-		
C05		1.									-			-	-		
006		1.	_	-							-	t. t.					
0.00	-	1									1	1		-	-	-	



								BPh	arm										
	Title of the	Course	Instrume	ental Methods of Anal	/sis														
	Course	Code	BP-701	r															
								Pa	τA										
	Voz	-	415		Somostor		716				Cradi	ta	L		Т	Р	С		
	lea		401		Semester		741				Ciedi	15	3		1	0	4		
	Course	Туре	Theory	only															
	Course Ca	ategory	Disciplin	ne Core															
	Pre-Requ	iisite/s									Co-Requi	isite/s							
	Course Ou & Bloom's	itcomes s Level	CO1- U CO2- G CO3- C CO4- S CO5- C	nderstand selected in ain knowledge on inte haracterization and e implify affinity of matte ategorize different or	strumental analytical te raction of EMR with m stimation of ions by spe er with stationary phase panic and inorganic con	echniques (spectro atter and to build th ectroscopical techn e and mobile phase mpounds using suit	scopic and chrom he analytical unde iiques( <b>BL4-Analy</b> a, physical and ch table spectroscop	atographic me erstanding at ti ze) emical proper ic and chroma	thods) and di ne level of ato ies of matter. tographic tecl	(BL2-Underst hniques.(BL3-	n volumetric analysis.(BL molecular structure of or and) Apply)	L2-Understand) ganic and inorganic cor	npounds with	n different fun	ctional groups and the	ir applications in pharm	nacy.(BL1-	Remember)	
	Coures El	ements	Skill De Entrepri Employ Profess Gender Human Environ	velopment V eneurship X ability V sonal Ethics X X Values X ment X			:	SDG (Goals)		SDG1(No p SDG8(Deo SDG17(Pa	overty) ent work and economic ( therships for the goals)	growth)							
								Pa	t B										
Modules				Contents								Pedagog	у					Hours	
UNIT 1	UV Visible spectroscopy Electronic transitions, chromophones, auxochromes, spectral shifts, solvent effect on absorption spectra, Bee and Lambert's law, Derivation and deviations. Instrumentation - Sources of radiation, wavelength selectors, sample cells, delectors UNIT Photo tube, Photomultigher tube, Photo voltaice cell, Stillon Photolodica Applications - Spectrophothemic tratrations, Single component and multi component analysis Fluorimetry Theory, Concepts of singlet, doublet and triptel electronic states, internal and external conversions, factors affecting fluoresce, quenching, instrumentation and applications								ed learning, in	nteractive class	s, Peer tutorial, Class usi	ing ICT tool/PPT/white b	ioard					10	
UNIT 2	Introduction, fundamental modes of obtainors in poly stornic molecules, sample handling, factora efficulting vibroatics, instrument 30 and 30 and 30 and 30 and 30 and 30							Lecture base	ed learning, in	iteractive class	s, Peer tutorial, Class usi	ing ICT tool/PPT/white b	oard				1		
UNIT 3	Introduction to applications. 1 Paper chroma Electrophores	chromatography Adsorp Thin layer chromatograph tography-Introduction, m is- Introduction, factors a	otion and partition ny- Introduction, P nethodology, deve affecting electroph	column chromatogra rinciple, Methodology lopment techniques, loretic mobility, Techn	ohy-Methodology, adva , Rf values, advantage: idvantages, disadvanta iques of paper, gel, cap	antages, disadvanti as, disadvantages a ages and applicatio pillary electrophore	ages and and applications. ons isis, applications	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board										10	
UNIT 4	Gas chromato applications H	graphy - Introduction, the ligh performance liquid cl	eory, instrumental hromatography (H	ion, derivatization, te IPLC)-Introduction, th	nperature programming eory, instrumentation, a	ng, advantages, dis advantages and ap	advantages and oplications.	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board										08	
UNIT 5	Ion exchange factors affectin applications A	chromatography- Introdung ion exchange, method finity chromatography- In finity chromatography- In	uction, classification tology and application ntroduction, theor	on, ion exchange resi ations Gel chromatogi y, instrumentation an	ns, properties, mechani aphy- Introduction, the I applications	nism of ion exchang eory, instrumentatio	le process, n and	white board									07		
								Pa	tC										
Moduk	es				Title						Indicative-ABCA/F Experiments/Field Internships	PBL/ work/			Bloom's Leve	4	۲	Hours	
1		Modal making of Gel ele	ectrophoresis						Experiment	ts				BL2-Underst	and		5		
							F	art D(Marks	Distributio	n)									
Total Ma	rks	Mini	mum Passino Ma	arks	E	xternal Evaluation	1	The	Min. E	xternal Evalu	ation	Inter	nal Evaluatio	on		Min. Internal Eval	uation		
100		50			75			38				25			13		-		
					- 1			Prac	tical										
Total Ma	rks	Mini	mum Passing Ma	arks	E	xternal Evaluation	ı		Min. E	xternal Evalu	ation	Interr	nal Evaluatio	on		Min. Internal Eval	uation		
L																			
								Pa	τE										
	Bool	ks	1.Instru	mental Methods of Cl	emical Analysis by B.K	K Sharma 2.Organi	c spectroscopy by	Y.R Sharma	3.Textbook of	Pharmaceutic	al Analysis by Kenneth A	A. Connors 4.Vogel's Te	xtbook of Qu	antitative Che	mical Analysis by A.I.	Vogel	-		
	Artic	es	NA																
	Reference	s Books	1. Practi	cal Pharmaceutical C	hemistry by A.H. Becke	ett and J.B. Stenlak	ke 2. Organic Che	mistry by I. L.	Finar 3. Orga	anic spectrosco	opy by William Kemp 4. 0	Quantitative Analysis of	Drugs by D.	C. Garrett					
L	MOOC C	ourses	https://n	ptel.ac.in/															
	Vide	DS	you tube	1															
							,	Ourse Artio	ilation Met	rix									
COs	P01	PO2	PO3	PO4	P05 I	P06	P07	PO8	PO	9	PO10	P011	PO12	P	SO1	PSO2	PSO3		
CO1 3 1 · · · · · · · · · · · · · · · · ·							2	1											
															-		1	-	

CO1	3	1	-	-	1	2	-	-	-	-	3	-	1	2	1
CO2	2	3	-	2	•	-	-	-	-	-	3	-	1	1	1
CO3	2	2	-	1	-	-	-	-	-	-	3	-	1	1	2
CO4	2	2	-	-	-	-	-	-	-	-	2	-	1	2	1
CO5	2	2	-	-	-	-	-	-	-	-	2	-	1	1	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



						BPharm							
	Title of th	e Course	Human Anatomy and Phy	siology II								-	
	Course	Code	BP201T										
						Part A							
	¥-		4-1	S-m-ster	0			Condito	L	т	P	с	
	те	ar	ist	Semester	zna			Credits	3	1	0	4	
	Course	э Туре	Theory only										
	Course C	Category	Discipline Core										
	Pre-Req	uisite/s						Co-Requisite/s					
	Course O & Bloom	utcomes 's Level	CO1- Explain the gross r CO2- Describe the various CO3- Identify the various CO4- Perform the hemat CO5- Appreciate coordin	orphology, structure and functions of various organs s homeostatic mechanisms and their imbalances(BL tissues and organs of different systems of human bo- logical tests like blood cell counts, haemoglobin estir ated working pattern of different organs of each syste	of the human boo 2-Understand) dy(BL3-Apply) mation, bleeding/o m(BL2-Understa	dy.(BL1-Remember) clotting time etc and also record blo and)	ood pressure, heart rate,	pulse and respiratory volume. (BL3-A	pply)				
	Coures E	lements	Skill Development ✓ Entrepreneurship X Employability ✓ Professsonal Ethics X Gender X Human Values X Environment X			SDG (Goals)	SDG1(No poverty) SDG3(Good health and SDG4(Quality educatio SDG17(Partnerships fo	d well-being) n) r the goals)					
						Part B							
Modules			Contents					Pedagogy				Hours	
UNIT 1	Nervous syst action potent cerebrospina afferent and	em Organization of nervous syste ial, nerve impulse, receptors, syn I fluid. Structure and functions of efferent nerve tracts, reflex activit	m, neuron, neuroglia, clas apse, neurotransmitters. C orain (cerebrum, brain ster /)	sification and properties of nerve fibre, electrophysiolo ntral nervous system: Meninges, ventricles of brain a n, cerebellum), spinal cord (gross structure, functions	ogy, and Lectur of	re based learning, interactive class,	, Peer tutorial, Class usir	ng ICT tool/PPT/white board			10		
UNIT 2	Digestive sys regulation of intestine, and disorders of	tem Anatomy of GI Tract with spe acid production through parasym atomy and functions of salivary gla GIT. • Energetics Formation and n	cial reference to anatomy pathetic nervous system, p ands, pancreas and liver, m ole of ATP, Creatinine Phos	and functions of stomach, (Acid production in the ston apsin role in protein digestion) small intestine and larg overments of GIT, digestion and absorption of nutrient phate and BMR.	nach, ge ts and Lectur	re based learning, interactive class,	, Peer tutorial, Class usir	ng ICT tool/PPT/white board				06	
UNIT 3	Anatomy of r Volumes and urinary tract formation, mi	espiratory system with special ref capacities transport of respirator with special reference to anatomy cturition reflex and role of kidneys	erence to anatomy of lungs / gases, artificial respiration of kidney and nephrons, fu- in acid base balance, role	, mechanism of respiration, regulation of respiration L a, and resuscitation methods. Urinary system Anatom nctions of kidney and urinary tract, physiology of urin of RAS in kidney and disorders of kidney.	Lung iy of ie Lectur	re based learning, interactive class,		10					
UNIT 4	Endocrine sy parathyroid g	stem Classification of hormones, land, adrenal gland, pancreas, pi	mechanism of hormone ac neal gland, thymus and the	tion, structure and functions of pituitary gland, thyroid ir disorders	gland, Peer t	Peer tutorial							
UNIT 5	Reproductive hormones, pl Chromosome	e system Anatomy of male and fer hysiology of menstruation, fertiliza as, genes and DNA, protein synth	nale reproductive system, l tion, spermatogenesis, oo esis, genetic pattern of inh	unctions of male and female reproductive system, se genesis, pregnancy and parturition Introduction to gen ritance	ex netics Lectur	re based learning, interactive class,	, Peer tutorial, Class usir	ng ICT tool/PPT/white board				09	
						Part C							
Modul	les			Title			Indicative-ABCA/ Experiments/Field Internships	PBL/ work/		Bloom's Level		Hours	
1		Create respiratory model using	baloon and bottle			Experiments			BL3-Apply		:	3	
·					Part D(I	Marks Distribution)							
		-				Theory		1.1					
100 Iotal Ma	arns	Minimum Pi	issing Marks	External Evaluation	39	Min. External Evalua	alion	Internal Evaluation		13	nın. Internai Evali	Jation	
		3			30	Practical				2			
Total Ma	arks	Minimum Pa	assing Marks	External Evaluation		Min. External Evalua	ation	Internal Evaluation		N	lin. Internal Eval	uation	
1										-			
						Port E							
	Boo	ks	1. Essentials of Medical I	Physiology by K. Sembulingam and P. Sembulingam.	Jaypee brothers'	medical publishers, New Delhi. 2. A	Anatomy and Physiology	in Health and Illness by Kathleen J.V	. Wilson, Church	nill Livingstone, New Y	York		
	Artic	cles	https://www.medicalnews	oday.com/articles/248743				•					
References Books 1. Physiological basis of Medical Practice-Best and Tailor. Williams & Wilkins Co, Rin Publishers Kolkata						USA 2. Text book of Medical Physic	ology- Arthur C, Guyton a	and John. E. Hall. Miamisburg, OH, U	S.A. 3. Human P	Physiology (vol 1 and :	2) by Dr. C.C. Cha	stterrje, Academic	
	MOOC	Courses	https://www.edx.org/learn	human-anatomy									
	Vide	205	https://www.voutube.com	watch?v=uBGI2BuikPO							-		

							Co	urse Articulation	Matrix						
COs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	•	-	2	2	-	1	-	-	3	-	3	-	2
CO2	1	-	-	1	-	1	-	1	-	-	3	-	3	-	2
CO3	3	-	•	1	1	1	-	-	-	-	3	-	2	-	2
CO4	1	-	-	1	1	1	-	2	-	-	2	-	2	-	2
CO5	1	-	•	2	1	1	1	1	-	-	2	-	2	-	1
CO6	-	-	•	-	-		-	-	-	-	-	-	-	-	-



								DFIId										
	Title of the	Course	Pharmaceutical	Organic Chemis	try I													
	Course	Code	BP202T															
L			1					-										
								Part	A				1	т		Р	c	
	Yea	r	1st		Semester	2	2nd				Credits		L	1		P		
		-											3	1		U	4	
	Course	Туре	I heory only															
	Course Ca	itegory	Discipline Core															
	Pre-Requ	isite/s									Co-Requisite/	5						
	Course Ou & Bloom's	tcomes i Level	CO1- Understar CO2- To remem CO3- To apply t CO4- To discus CO5- To elabor	d and application over the orientation e knowledge for chemistry and the the concepts	ons of nomenclature, on of reactions and i or the identification of reactions of various of hybridization, ele	e, properties, reaction influence products. of organic compound s organic compound actronic and steric e	ons and uses of o (BL1-Remember ids.(BL3-Apply) ds.(BL2-Understa effects of organic	rganic compour r) Ind) compounds.(BL	ds.(BL3-	-Apply) stand)								
	Coures Ele	ements	Skill Developme Entrepreneursh Employability X Professional Et Gender X Human Values Environment X	nt√ o× iics×			SDC	à (Goals)		SDG3(Good hea SDG4(Quality eo SDG9(Industry I	alth and well-being) fucation) nnovation and Infrastruc	ture)						
								Part	в									
Modules			c	ontents								Pedagog	у					Hours
UNIT 1	Classification,	nomenclature and isome	ism Classification of Org	anic Compound	Is Common and IUP.	PAC systems of nor	menclature of	Lecture based	l learning	, interactive class	, Peer tutorial, Class usi	ng ICT tool/PPT/white t	board					07
	Alkanes* Alka	nes* and Conjunated dia	es* SP3 hybridization in	alkanas Holos	enation of alkanon	uses of naraffing	Stabilities of											<u> </u>
UNIT 2	alkenes, SP2 I carbocations, electrophilic ac orientation. St rearrangemen	hybridization in alkenes E Saytzeffs orientation and ddition reactions of alken ability of conjugated dien t	1 and E2 reactions – kin avidences. E1 verses E2 s, Markownikoff's orient s, Diel-Alder, electrophil	tics, order of re reactions, Fact tion, free radica addition, free	activity of alkarles, t activity of alkyl halid ors affecting E1 and al addition reactions radical addition reac	des, rearrangement des, rearrangement d E2 reactions. Ozo of alkenes, Anti Ma ctions of conjugated	t of onolysis, arkownikoff's d dienes, allylic	Lecture based	l learning	, interactive class	, Peer tutorial, Class usi	ng ICT tool/PPT/white t	board					10
UNIT 3	Alkyl halides* SN1 versus SI trichloroethyle uses of Ethyl a	SN1 and SN2 reactions - V2 reactions, Factors affe ne, tetrachloroethylene, c alcohol, Methyl alcohol, cl	kinetics, order of reactivi cting SN1 and SN2 reac ichloromethane, tetrachl lorobutanol, Cetosteryl a	y of alkyl halide ons Structure a romethane and cohol, Benzyl a	s, stereochemistry a and uses of ethylchlo l iodoform. Alcohols* alcohol, Glycerol, Pro	and rearrangement oride, Chloroform, *- Qualitative tests, opylene glycol	t of carbocations.	Lecture based	l learning	, interactive class	, Peer tutorial, Class usi	ng ICT tool/PPT/white t	board					10
UNIT 4	Carbonyl comp condensation, Structure and	counds* (Aldehydes and Cannizzaro reaction, Cro uses of Formaldehyde, P	tetones) Nucleophilic ad ssed Cannizzaro reactio araldehyde, Acetone, Ch	ition, Electrome , Benzoin cond pral hydrate, He	eric effect, aldol con lensation, Perkin cor examine, Benzaldeh	idensation, Crossed indensation, qualita hyde, Vanilin, Cinna	d Aldol itive tests, amaldehyde.	Lecture based	l learning	, interactive class	, Peer tutorial, Class usi	ng ICT tool/PPT/white t	board					10
UNIT 5	Carboxylic aci amide and est Benzoic acid, substituent on	ds* Acidity of carboxylic a er Structure and Uses of Benzyl benzoate, Dimeth Basicity. Qualitative test,	cids, effect of substituen Acetic acid, Lactic acid, I phthalate, Methyl salic Structure and uses of El	s on acidity, ind artaric acid, Citr late and Acetyl anolamine, Eth	uctive effect and qua ric acid, Succinic aci salicylic acid Aliphat tylenediamine, Ampt	alitative tests for ca id. Oxalic acid, Sali atic amines* - Basic whetamine	arboxylic acids, icylic acid, ity, effect of	Lecture based	l learning	, interactive class	, Peer tutorial, Class usi	ng ICT tool/PPT/white t	board					08
								Part	с									
Module	es				Title						Indicative-ABCA/P Experiments/Field v	'BL/ vork/			Bloom's Lev	el	,	Hours
1		study of lab chemical iso	nerism						PBL		internollips			BL2-Understan	ł		3	
							-	art D/Marke	Distribut	tion)								
							F	Theo	ry									-
Total Ma	rks	Minir	um Passing Marks		E	xternal Evaluation	1		Min	. External Evalua	tion	Inter	nal Evaluatio	n		Min. Internal Eval	uation	
100		50	- 1		75			38				25			13			-
					1			Pract	cal			1			4			-
Total Ma	rks	Minir	um Passing Marks		E	xternal Evaluation	1		Min	. External Evalua	ition	Inter	nal Evaluatio	n		Min. Internal Eval	uation	
															1			
			1					Part	E									
	Book	s	1. Organic Cher	istry by Morriso	on and Boyd 2. Orga	anic Chemistry by I	.L. Finar, Volume-	I 3. Textbook of	Organic	Chemistry by B.S	. Bahl & Arun Bahl							
	Articl	es	NA															
	References	Books	1. Introduction to	Organic Labora	atory techniques by I	Pavia, Lampman a	and Kriz. 2. Reacti	on and reaction	mechani	ism by Ahluwaliah	/Chatwal							
	MOOC Co	ourses	https://extended	tudies.ucsd.edu	u/courses-and-progra	rams/organic-chem	iistry-i											
	Video	95	https://www.you	ibe.com/watch?	V=XQhomr7j44M&li	list=PLNiSYvRcckS	SyPEJ_PFIK-kfE6	6UUB_zmM										
							c	Course Articul	ation M	atrix								
COs	PO1	PO2	P03 P04	1	P05 I	PO6	P07	PO8	F	PO9	PO10	PO11	PO12	PSC	01	PSO2	PSO3	
CO1	3	-		:	3 .		2	-	-		-	3	-	3		-	2	-

001	3	-	-	-	3	-	2	-	-	-	3	-	3	-	2
CO2	2	-	-	-	3	-	1	-	-	-	3	-	1	-	2
CO3	2	2	-		2	•	-	-	-	-	3	-	2	-	2
CO4	2	1	-		1	•	1	-	-	-	3	-	1	-	2
CO5	2	1	1	-	1	-	-	-	-	-	3	-	1	-	2
CO6			-		-	•	-	-	-	-	-	-	-	-	-



-									
	Title of the Course	Biochemistry							
	Course Code	BP203T							
				Part A					
	No. 1		<b>0</b>		<b>0</b> . W	L	т	P (	5
	tear	151	Semester	2nd	Crédits	3	1	0 4	i i
	Course Type	Theory only							
	Course Category	Discipline Core							
	Pre-Requisite/s				Co-Requisite/s				
	Course Outcomes & Bloom's Level	CO1- To remember the CO2- To understand the CO3- To apply the control CO4- To distinguish the CO5- To evaluate the	e properties, significance and metabolic reactions of carb he metabolism of carbohydrates and process of electron iccept of catalytic activity and enzyme inhibition in design le process of DNA replication, transcription and translatio causes, manifestations and diagnosis of metabolic disord	pohydrates, lipids, nucleic acids, proteins and an transport and ATP formation( <b>BL2-Understand</b> ) of new drugs, diagnostic and therapeutic applica n( <b>BL2-Understand</b> ) ders( <b>BL5-Evaluate</b> )	ino acids(BL1-Remember) ions of enzyme(BL3-Apply)				
	Coures Elements	Skill Development ✓ Entrepreneurship X Employability ✓ Professsonal Ethics X Gender X Human Values X Environment X		SDG (Goals)	SDG3(Good health and well-being) SDG4(Quality education)				
				Part B					
Modules		Conten	its		Pedagogy				Hours
									-

Modul	05	Title		Indicative-ABCA/PBL/	Bloom's Level	Hours
			Par	c		
UNIT 5	Introduction, p Enzyme inhibi and diagnostic	sroparties, nomenclature and IUB classification of enzymes Enzyme kinetics (Michaelis plot, Line Weaver Burke plot) liters with scampible Regulation of enzymes: enzyme includion and regression, allobatic enzymes regulation Therapeutic c applications of enzymes and isoenzymes Coenzymes –Structure and biochemical functions	Lecture base	I learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board		07
UNIT 4	Nucleic acid m nucleotides ar DNA replicatio	netabolism and genetic information transfer Biosynthesis of purine and pyrimidine nucleotides Catabolism of purine nd Hyperurioemia and Goud disease Organization of mammalian genome Structure of DNA and RNA and their functions on (semi conservative model) Transcription or RNA synthesia Genetic code, Translation or Protein synthesis and Inhibitors	Lecture base	t learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board		10
UNIT 3	Lipid metaboli synthesis of fa hormone and metabolism G Catabolism of Synthesis and hyperbilirubine	ism β-Oxdadion of saturated fatty acid (Palmitic acid) Formation and utilization of ketome bodies; ketoacidosis De novo htty acids (Palmitic acid) Biological arginizance of cholesterol and conversion of cholesterol in bio acids, steroid vitamin D Disorders of lipid metabolism: Hypercholesterolemia, afterocalerosis, fatty liver and Oesby, Harno acid present texcitors of anno acid metabolism. The assemination centration of acidstretory libor, uses cycle and lis disorders storage texcitors of anno acid metabolism. The assemination centration of acidstretory libor, uses cycle and lis disorders and the acid acidstretory of the acid acid acid acid acid acid acid acid	Lecture base	I learning, interactive class, Peer tutorial, Class using ICT tooIPPT/white board		10
UNIT 2	Carbohydrate HMP shunt an glycogen stora Diabetes melli and substrate	metabolism Glycolysis – Pathway, energetics and significance Citric acid cycle. Pathway, energetics and significance Id is significance; Clucose-6-Phosphate dehydogenae; (GSPD) deficiency Clycogen metabolism Pathways and age disease; (SSD) Cluconcegenesis - Pathway and Is significance Homous i regulation of blood plucose level and Ilus Biological oxidation Electron transport chain (ETC) and its mechanism. Oxidative phosphorylation & Its mechanism level phosphorylation Inhibitors ETC and oxidative phosphorylation/Levenpulses.	Lecture base	I learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board		10
UNIT 1	proteins. Bioe entropy; Redo	Introductor, cassing and the second s	Lecture base	I learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board		08

Modules	Title	Experiments/Field work/ Internships	Bloom's Level	Hours
1	DNA MODEL MAKING	Simulation	BL2-Understand	5
	- Part D(Marks	Distribution)		

			Theory		
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation
100	50	75	38	25	13
			Practical		
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation
1					

	Part E
Books	1. Textbook of Biochemistry by Rama Rao. 2. Textbook of Biochemistry by Deb.
Articles	https://www.mcgill.ca/biochemistry/about-us/information/biochemistry
References Books	1. Principles of Biochemistry by Lehninger. 2. Harper's Biochemistry by Robert K. Murry, Daryl K. Granner and Victor W. Rodwell. 3. Biochemistry by Stryer.
MOOC Courses	https://www.edx.org/learn/biochemistry/harvard-university-principles-of-biochemistry/index=product&queryID=8f52c57d14373630030886485bfd4dfc&position=1&linked_from=autocomplete&c=autocomplete
Videos	https://www.youtube.com/watch?v=GJAI855ckhyk&liist=PLTUO2.J9MZQt1bmOFMAaWB8Nxa2qslnWPe

							Co	urse Articulation	Matrix						
COs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	P011	PO12	PSO1	PSO2	PSO3
CO1	3	2	•	-	-	1	-	-	-	-	3	-	2	1	3
CO2	2	1	•	-	1	-	-	-	-	-	3	-	2	1	2
CO3	2	2	-	-	-	-	-	-	-	-	3	-	2	1	1
CO4	3	2	-	1	1	-	1	-	-	-	2	-	1	-	1
CO5	3	1	-	1	1	-	-	-	-	-	2	-	-	-	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



				Briani								
	Title of the Course	Pathophysiology										
	Course Code	BP204T										
				Part A								
	Vor	1st	Semester	and	Gradita	L	т	Р	С			
	1681	101	Semester	2110	Credits	3	1	0	4			
	Course Type	Theory only										
	Course Category	Discipline Core										
	Pre-Requisite/s				Co-Requisite/s							
	Course Outcomes & Bloom's Level	CO1- To understand the CO2- To understand the CO3- To apply the print CO3- To apply the print CO4- To explain the eff CO5- To evaluate the print CO5- To eva	e process of cell injury, morphology of cell injury and ce e etiopathogenesis of cardiovascular, respiratory and r ciples of pathogenesis in understanding symptoms, sig iopathogenesis of hematologic, endocrine, nervous, ga principles of physical, chemical and biologic carcinogen	Ilular adaptations. (BL2-Understand) anal diseases mentioned. (BL2-Understand) as and complications of disease states mentioned. strointestinal, muscular skeletal diseases and Imm asis. (BL5-Evaluate)	(BL3-Apply) uncpathogenesis of infectious diseases.(BL1-Remember)							
	Coures Elements	Skill Development V Entrepreneurship X Employability V Professsonal Ethics X Gender X Human Values X Environment X		SDG (Goals)	SDG3(Good health and well-being) SDG4(Quality education)							
				Part B								
Modules		Conten	ts		Pedagogy					Hours		
UNIT 1	Basic principles of Cell injury and Adaptation Causes of cellulary Injury, Pathogenesis (Cell Morphology of cell injury – Adaptive changes accumulation, Catolification, Enzyme leakage the process of inflammation and repair. Introc Inflammation – Alteration in vascular permeal wound healing in the skin, Pathophysiology o	Introduction, definitions, membrane damage, Mitor (Atrophy, Hypertrophy, hy and Cell Death Acidosis & Juction, Clinical signs of in bility and blood flow, migra f Atherosclerosis	Homeostasis, Components and Types of Feedback sys hondrial damage, Ribosome damage, Nuclear damage perplasia, Metalesia, Dysplasia, Cleil swelling, Intra o AtAkalosis, Electrolyte imbalance Basic mechanism invo fammation, Different types of Intiammation, Mechanisr ation of WBC's, Mediators of Inflammation, Basic princip	lems, ), Billiar Ived in of les of	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board							
UNIT 2	Cardiovascular System: Hypertension, conge and arteriosclerosis) Respiratory system: Ast	stive heart failure, ischerr hma, Chronic obstructive	ic heart disease (angina, myocardial infarction, atheros airways diseases. Renal system: Acute and chronic ren	clerosis al failure Lecture based learning, interactive clas	ss, Peer tutorial, Class using ICT tool/PPT/white board				10			
UNIT 3	Haematological Diseases: Iron deficiency, me acquired anemia, hemophilia Endocrine syste Parkinson's disease, stroke, psychiatric disor Ulcer	egaloblastic anemia (Vit B em: Diabetes, thyroid dise ders: depression, schizop	12 and folic acid), sickle cell anemia, thalasemia, hered ases, disorders of sex hormones Nervous system: Epile hrenia and Alzheimer's disease. Gastrointestinal syster	itary psy, n: Peptic Lecture based learning, interactive clas	is, Peer tutorial, Class using ICT tool/PPT/white board				10	1		
	Inflammatory bowel diseases, jaundice, hepa	titis (A.B.C.D.E.F) alcohol	ic liver disease. Disease of bones and joints: Rheumate	id								

UNIT 4	Inflarmatory bowel diseases, jaundice, hepathis (AB,C,D,E,F) alcoholic liver disease. Disease of bones and joints: Rheumatoid arthritis, osteporosis and gout Principles of cancer: classification, etiology and pathogenesis of cancer Diseases of bones and joints: Rheumatoid Arthritis, Osteoporosis, Gout Principles of Cancer: Classification, etiology and pathogenesis of Cancer	Lecture base	d learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board	08
UNIT 5	Infectious diseases: Meningitis, Typhoid, Leprosy, Tuberculosis Urinary tract infections Sexually transmitted diseases: AIDS, Syphilis, Gonorrhea	Lecture base	d learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board	07
		Par	t C	
			Indicative-ABCA/PBL/	

	Modules	Title	Experiments/Field work/ Internships	Bloom's Level	Hours
1		Different desease model making	Seminar	BL2-Understand	5

			F	Part D(Marks Distribution)		
				Theory		
Ì	Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation
	100	50	75	38	25	13
Γ				Practical		
ī	Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation

0

	Part E
Books	1. Vinay Kumar, Abul K. Abas, Jon C. Aster, Robbins & Cotran Pathologic Basis of Disease; South Asia edition; India; Elsevier; 2014. 2. Harsh Mohan; Text book of Pathology; 6th edition; India; Jaypee Publications; 2010. 3. Laurence B, Bruce C, Bjorn K.; Goodman Gilman's The Pharmacological Basis of Therapeutics; 12th edition; New York; McGraw-Hill; 2011.
Articles	1. The Journal of Pathology. ISSN: 1096-9898 (Online) 2. The American Journal of Pathology. ISSN: 0002-9440 3. Pathology. 1465-3931 (Online) 4. International Journal of Physiology, Pathophysiology and Pharmacology. ISSN: 1944-8171 (Online)
References Books	1. William and Wilkins, Baltimore;1991 [1990 printing]. 2. Nicki R. Colledge, Brian R. Walker, Shaurt H. Ralston; Davidson's Principles and Practice of Medicine; 21et editors; Undorn; ELBS/Churchill Livingstone; 2010. 3. Guydon A. John E. Hait: Testbook of Medical Physiology: 140 priority Statistical Control Physiology: 140 priority S
MOOC Courses	https://www.coursera.org/courses?query≃pathophysiology
Videos	htps://www.youtube.com/@RhesusMedicine

	Course Articulation Matrix														
COs	PO1	PO2	P03	PO4	P05	PO6	P07	P08	PO9	PO10	P011	P012	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	1	-	1	-	-	3	-	3	-	3
CO2	3	2	-	-	-	1	-	1	-	-	3	-	2	-	2
CO3	2	-	-	-	-	1	-	1	-	-	3	-	2	-	2
CO4	2	2	-	1	1	-	-	-	-	-	3	-	2	-	2
CO5	3	1	-	1	-	-	-	-	-	-	3	-	1	-	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



					synabus-	2023-2024						
					BPh	narm						
	Title of the	Course	Computer Applications in Ph	armacy *								
	Course	Code	BP205T									
1					Pa	irt A			1	т	Р	C
	Yea	r	1st	Semester	2nd		Credits		2		P	2
-	C	T	Theory only						3	U	0	3
	Course	Type	Dissipling Care									
-	Dea Deau	icitala	Discipline Core				Co Dominito	-				
-	Pre-Requ	iisite/s	004 T 1 1 1 1 1 1				Co-Requisite	15				
	Course Ou & Bloom'	itcomes s Level	CO2- To illustrate the conce CO3- Applications of web te CO4- To evaluate the applic CO5- To explain about bioin	It types of databases, applications of computers and batabase of number system in computers. (BL2-Inderstand) chnologies such as HTML, XML, CSS, programming langue ations of computers in pharmacy such as drug information s formatics and its impact in vaccine discovery. (BL1-Rememi	ages, Web sen services, pharn ber)	vers and pharmacy drug database. (BL3-Apply) nacokinetics, mathematical model in drug design	, hospital and clinical pharmacy etc.,(B	L5-Evaluate)				
Skil Levelogment / Entrepreurship / Employability / Courres Elements Professional Ethics X Gender X Human Values X Entvironment X						SDG (Goals)	SDC4(Quality education) SDC5(Gender equality)					
					D-	+ P.						
Modules			Contents		га		Pedagogy					Hours
	Number syste	m: Binary number system Decin	nal number system. Octal nun	ber system. Hexadecimal number systems, conversion								
UNIT 1	decimal to bin method, binar feasibility ana project	ary, binary to decimal, octal to bi y multiplication, binary division C lysis, data flow diagrams, proces	nary etc, binary addition, binar concept of Information System s specifications, input/output of	y subtraction – One's complement, Two's complement s and Software: Information gathering, requirement and lesign, process life cycle, planning and managing the	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board						06	
UNIT 2	Web technolo Introduction to	gies: Introduction to HTML, XML databases, MYSQL, MS ACCE	, CSS and Programming lange SS, Pharmacy Drug database	ages, introduction to web servers and Server Products	Lecture base	ed learning, interactive class, Peer tutorial, Class	using ICT tool/PPT/white board					06
UNIT 3	Application of Hospital and dispensing of System, Phar	computers in Pharmacy – Drug i Clinical Pharmacy, Electronic Pre drugs, mobile technology and ad ma Information System	information storage and retriev scribing and discharge (EP) s therence monitoring. Diagnost	ral, Pharmacokinetics, Mathematical model in Drug design, ystems, barcode medicine identification and automated ic System, Lab-diagnostic System, Patient Monitoring	Lecture base	ed learning, interactive class, Peer tutorial, Class	using ICT tool/PPT/white board					06
UNIT 4	Bioinformatics in Vaccine Dis	: Introduction, Objective of Bioint	formatics, Bioinformatics Data	bases, Concept of Bioinformatics, Impact of Bioinformatics	Lecture base	ed learning, interactive class, Peer tutorial, Class	using ICT tool/PPT/white board					06
UNIT 5	Computers as System (LIMS	data analysis in Preclinical deve and Text Information Managem	elopment: Chromatographic da ent System (TIMS)	da analysis (CDS), Laboratory Information management	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board 06							06
					Pa	# C						
					га	Indicative-ABC	:A/PBL/					
Module	les			Title		Experiments/Field work/ Internships						Hours
1		CADD				Simulation		BL2-Understand			3	
											1	
				F	Part D(Marks	s Distribution)						
Total Ma	arks	Minimum P	assing Marks	External Evaluation		Min External Evaluation	Internal Evaluat	ion		Min Interna	al Evaluation	,
75	ano	38		50	25	In External Evaluation	25		13			
					Prac	stical						
Total Ma	arks	Minimum P	assing Marks	External Evaluation	Flac	Min External Evaluation	Internal Evaluat	ion		Min Interna	al Evaluation	,
						Mill. External Evaluation	internal Evaluat			Milli. Interne		
		0										
					Pa	.+ E						
	Boo	ks	1. Computer Application in F Publication, USA	harmacy - William E.Fassett -Lea and Febiger, 600 South	Washington S	iquare, USA, (215) 922-1330. 2. Computer Applic	cation in Pharmaceutical Research and	Development -Se	an Ekins – Wiley-Int	erscience, A	John Willey a	and Sons, INC.,
	Artic	es	https://copbela.org/download	s/2020/SELF%20LEARNING%20MATERIAL%20BPHARM	A/semester%2	202/BP205T/MODULE%2003.PDF						
	Reference	s Books	1. Bioinformatics (Concept, S	Skills and Applications) – S.C. Rastogi-CBS Publishers and	Distributors, 4	596/1- A, 11 Darya Gani, New Delhi – 110 002(IN	IDIA) 2. Microsoft office Access - 2003,	Application Develo	opment Using VBA,	SQLServer, D	AP and Info	path – Cary
	MOOC C	ourses	https://www.edx.org/certifica 210c6339e074&campaign=E	es/professional-certificate/harvardx-data-science?index=professional-certificate/harvardx-data-science?index=pro bata++Science&source=edx&product_category=professional- ata++Science&source=edx&product_category=professional- ata++Science&source=edx&product_category=professional- ta-ta-ta-ta-ta-ta-ta-ta-ta-ta-ta-ta-ta-t	oduct&results_ al-certificate&p	level=first-level-results&term=COMPUTER+PH/ lacement_url=https%3A%2F%2Fwww.edx.org%	ARMACY%22&objectID=program-3c32 2Fsearch	e3e0-b6fe-4ee4-bd	4f-			

PO8 PO9

PO10

PO12

2

2

1

1

1

PSO1

1

1

1

PO11

3

2

2

3

1

PSO2

1

1

1

PSO3

1

1

С

PO7

Videos

PO2

1

PO3

PO1

COs

CO1 CO2 CO3 CO4 CO5 CO6 https://www.youtube.com/watch?v=vRDswGc2wyM

PO5

1

1

1

PO4

P06

1

1

1



	Title of the Course	Human Anatomy and Physiology II												
	Course Code	BP207P												
	Yoar	1 et	Somester	and	Gradita	L	т	Р	С					
	iea.	151	Semester	210	Ciedita	0	0	2	2					
	Course Type	Lab only												
	Course Category	Discipline Core												
	Pre-Requisite/s				Co-Requisite/s									
	Course Outcomes & Bioom's Level CO1- To recall the physiology of special senses with the help of models, charts and specimens (BL1-Remember) CO2- To develop the knowledge on coordinating working of organs of various systems with the help of models, charts and specimens (BL3-Apply) CO3- To avalyze the functions of carainal news by various sensory and motor functions, (BL4-Analyze) CO4- To evaluate body temperature and body mass index.(BL3-Levaluate) CO5- To evaluate body temperature and body mass index.(BL3-Levaluate) CO5- To evaluate body temperature and body mass index.(BL3-Apply)													
Skill Development ✓ Entrepreneurship × Employebilty ✓ Courres Elements Professional Ethics × SD Gender × Human Values ×					SDG3(Good health and well-being) SDG4(Quality education)									

	Part B		
Modules	Contents	Pedagogy	Hours
UNIT 1	Nervous system Organization of nervous system, neuron, neurogila, classification and properties of nerve fare, electrophysiology, action potential, never imputes, receptor, synapse, neurotrammitiers. Cantal nervous system: Nervinges, ventrices of brain and cerebrophial fluid. Structure and functions of brain (cerebrum, brain stem, cerebellum), spinal cord (gross structure, functions of affendit and effective networks).	Peer tutorial	10
M		·	

	Part C												
Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours									
1	<ol> <li>To study the integumentary and special senses using specimen, models, etc., 2. To study the nervous system using specimen, models, etc., 3. To study the endocrine system using specimen, models, etc 4. To demonstrate the general neurological examination</li> </ol>	Experiments	BL2-Understand	16									
2	<ol> <li>To demonstrate the function of olfactory nerve 6. To examine the different types of taste. 7. To demonstrate the visual acuity 8. To demonstrate the reflex activity</li> </ol>	Experiments	BL3-Apply	16									
3	<ol> <li>Recording of body temperature 10. To demonstrate positive and negative feedback mechanism. 11. Determination of tidal volume and vital capacity. 12. Study of digestive, respiratory, cardiovascular systems, urinary and reproductive systems with the help of models, charts and specimens</li> </ol>	Experiments	BL3-Apply	16									
4	<ol> <li>Recording of basal mass index. 14. Study of family planning devices and pregnancy diagnosis test. 15. Demonstration of total blood count by cell analyser 16. Permanent slides of vital organs and gonads.</li> </ol>	Experiments	BL3-Apply	16									

	Part D(Marks Distribution)													
	Theory													
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation									
			Practical											
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation									
50	25	35	18	15	8									

	Part E
Books	1. Textbook of Practical Physiology by C.L. Ghai, Jaypee brothers medical publishers, New Delhi. 2. Practical workbook of Human Physiology by K. Srinageswari and Rajeev Sharma, Jaypee brother's medical publishers, New Delhi
Articles	NA
References Books	1. Physiological basis of Medical Practice-Best and Tailor. Williams & Wilkins Co, Riverview, MI USA 2. Text book of Medical Physiology- Arthur C, Guyton and John. E. Hall. Miamisburg, OH, U.S.A.
MOOC Courses	NA
Videos	NA

	Course Articulation Matrix														
COs	PO1	PO2	PO3	PO4	P05	PO6	P07	P08	PO9	PO10	P011	P012	PSO1	PSO2	PSO3
CO1	3	-	-	-	1	1	-	-	-	-	3	-	3	-	1
CO2	2	1	-	-	1	1	-	-	-	-	2	-	3	-	1
CO3	2	1	-	-	1	1	-	-	-	-	2	-	2	-	1
CO4	3	-	-	-		1	-	-	-	-	3	-	2	-	2
CO5	2	-	1	1	1	-	-	-	-	-	3	-	2	-	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



				BPharm							
Title of the Course	Pharmaceutic	al Organic Chemistry I									
Course Code	BP208P										
	Part A										
Year	1st	Semester	2nd	Credite	L	т	Ρ	с			
100	ist Semester		210	oreand -	0	0	2	2			
Course Type Lab only											
Course Category	Course Category Discipline Core										
Pre-Requisite/s				Co-Requisite/s	Minimum 5 unknown organic	compounds to be analysed syste	matically.				
Course Outcomes & Bloom's Level	CO1- To expl CO2- To iden CO3- To ana CO4- To app CO5- To ana	lain the qualitative analysis and tify the extra elements, presen lyze the presence of several fu raise the rules concerned with lyze unknown pharmaceutical	d preparation of pharmaceut at in the pharmaceutical orga inctional groups in pharmace reactivity and orientation of organic compounds by deter	cal organic compounds. (BL1-Remember) nic compounds. (BL2-Understand) utical compounds. (BL4-Analyza) urganic compounds. (BL3-Evaluate) mining their metiling point/balap point. (BL4-Analyze)							
Coures Elements	Skill Develop Entrepreneur Employability Professsonal Gender X Human Value Environment	ment V rship X / V I Ethics X es X X	SDG (Goals)	SDG4(Quality education) SDG8(Decent work and economic growth)							

#### Part C Indicative-ABCA/PBL/ Experiments/Field work/ Internships Modules Title Bloom's Level Hours Experiments Experiments Experiments Experiments Preliminary test: Color, odour, aliphatic/aromatic compounds, saturation and unsaturation, etc. 2. Detection of elements like Nitrogen, Sulphur and Halogen by Lassaigne's test 3. Solubility test BL3-Apply BL4-Analyze 4 4 BL3-Apply 4 з 4. Functional group test like Phenols, Amides/ Urea, Carbohydrates, Amines, Carboxylic acids, Aldehydes and Ketones, Alcohols, Esters, Aromatic and Halogenated Hydrocarbons, Nitro compounds and Anlides BL3-Apply 4 Experiments Experiments Experiments Exters, Aromatic and Hallogeneted Hydrocations, Netro compounds and Antides 5. Melling point/bioling point of organic compounds 6. Identification of the unknown compound from the ilterature using melting point/ boiling point. 7. Preparation of the derivatives and confirmation of the unknown compound by melling point/ boiling point. 8. Minimum 5 unknown organic compounds to be snalysed systematically. 1. Preparation of suitable solid derivatives from organic compounds 2. Construction of molecular models BL4-Analyze 4 BL4-Analyze BL6-Create 4 Experiments BL4-Analyze 4

Part B

Pedagogy

Hours

Contents

Modules

Theory												
Total Marks	Min. Internal Evaluation											
	Practical											
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation							
50	25	35	18	15	8							

	. Part E
Books	1. Practical Organic Chemistry by Mann and Saunders. 2. Vogel's text book of Practical Organic Chemistry
Articles	
References Books	
MOOC Courses	
Videos	

	Course Articulation Matrix														
COs	PO1	PO2	PO3	PO4	P05	PO6	P07	P08	PO9	PO10	P011	P012	PSO1	PSO2	PSO3
CO1	2	1	-	-	-	-	-	-	-	-	3	-	2	3	1
CO2	3	2	•	-	2	-	-	1	-	-	3	-	3	2	1
CO3	2	1	-	-	1	-	-	-	-	-	3	-	2	2	2
CO4	2	2	•	-	1	-	1	-	-	-	2	-	2	1	1
CO5	3	1	-	-	1	1	-	-	-	-	2	-	2	2	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



BPharm												
Title of the Course	Biochemistry											
Course Code	BP209P											
Part A												
Voar	1st	Somester	and	Cradita	L	т	Р	С				
Tear	151	Semester	210	Credits	0	0	2	2				
Course Type	Lab only	only										
Course Category	Discipline Core	Jiscipline Core										
Pre-Requisite/s				Co-Requisite/s								
Course Outcomes & Bloom's Level	CO1- To remember the CO2- To understand the CO3- To identify the an CO4- To examine and CO5- To determine the	e qualitative analysis of carbohydrates and proteins(BL1 e principle and clinical significance of blood glucose(Bl mount of reducing sugars by DNSA method(BL3-Apply) evaluate the constituents present in Urine and their clin e effect of temperature and substrate concentration on s	-Remember) -2-Understand) 									
Coures Elements	Skill Development ✓ Entrepreneurship X Employability ✓ Professsonal Ethics X Gender X Human Values X Environment X		SDG (Goals)	SDG3(Good health and well-being) SDG4(Quality education)								

Part B

Pedagogy

Hours

Contents

Modules

	Pai	tC		
Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	<ol> <li>Qualitative analysis of carbohydrates (Blucosa, Fructose, Lactose, Maltose, Sucrose and starch) 2. Identification tests for Proteins (albumin and Casein) 3. Quantitative analysis of reducing sugars (DNSA method) and Proteins (Bluret method) 4. Qualitative analysis of urine for abnormal constituents.</li> </ol>	Experiments	BL2-Understand	16
2	5. Determination of blood creatinine 6. Determination of blood sugar 7. Determination of serum total cholesterol 8. Preparation of buffer solution and measurement of pH	Experiments	BL3-Apply	16
3	<ol> <li>Study of enzymatic hydrolysis of starch 10. Determination of Salivary amylase activity 11. Study the effect of Temperature on Salivary amylase activity. 12. Study the effect of substrate concentration on salivary amylase activity.</li> </ol>	Experiments	BL3-Apply	16

Part D(Marks Distribution)											
Theory											
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation						
			Practical								
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation						
50	25	35	18	15	8						

	Part E
Books	1. Outlines of Biochemistry by Conn and Stumpf 2. Practical Biochemistry by R.C. Gupta and S. Bhargavan
Articles	NA
References Books	1. Introduction of Practical Biochemistry by David T. Plummer. (3rd Edition) 2. Practical Biochemistry for Medical Students by Rajagopal and Ramakrishna. 3. Practical Biochemistry by Harold Varley
MOOC Courses	NA
Videos	NA

	Course Articulation Matrix														
COs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	-	3	-	2	-	-	-	-	3	-	3	1	2
CO2	2	1	-	2	1		-	-	-	-	3	-	1	1	2
CO3	3	3	-	2	-	1	-	-	-	-	3	-	3	1	2
CO4	2	2	-	2	-		-	-	-	-	3	-	1	-	3
CO5	2	2	-	1	-	-	-	-	-	-	2	-	2	-	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



			BPharm										
Title of the Course	Computer Applications in F	uter Applications in Pharmacy *											
Course Code	BP210P												
			Part A										
Vear	1st	Semester	2nd	Credits	L	т	Ρ	С					
iea.	160	Semester	210	Cieuta	0	0	1	1					
Course Type	Lab only	a only											
Course Category	Discipline Core	iscipline Core											
Pre-Requisite/s				Co-Requisite/s									
Course Outcomes & Bloom's Level	CO1- To demonstrate and CO2- To understand the p CO3- To summarize the re CO4- To design a question CO5- To create HTML we	I make use of MS Office, MS Word, MS Excel, MS Access and A aradigms of program languages and be exposed to at least one sport and printing the report from patient database( <b>BL2-Unders</b> ) maire using a word processing package to gather information at page to show personal information( <b>BLE-Create</b> )	AS Power point.(BL1-Remember) language from each model, C and SQL.(BL2-Understand tand) bout a particular disease.(BL3-Apply)	a)									
Coures Elements	Skill Development J Entrepreneurship J Employability J Professsonal Ethics X Gender X Human Values X Environment X		SDG (Goals)	SDG4(Quality education)									

# Part B

Pedagogy

Hours

Contents

Modules

	Part C												
Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours									
1	Design a questionnaire using a word processing package to gather information about a particular disease	Experiments	BL2-Understand	4									
2	Create a HTML web page to show personal information.	Experiments	BL2-Understand	4									
3	Retrieve the information of a drug and its adverse effects using online tools	Experiments	BL2-Understand	4									
4	Creating mailing labels Using Label Wizard, generating label in MS WORD	Experiments	BL2-Understand	4									
5	Create a database in MS Access to store the patient information with the required fields Using access	Experiments	BL6-Create	4									
6	Design a form in MS Access to view, add, delete and modify the patient record in the database	Experiments	BL2-Understand	4									
7	Generating report and printing the report from patient database	Experiments	BL3-Apply	4									
8	Creating invoice table using – MS Access	Experiments	BL3-Apply	4									

#### Part D(Marks Distribution) Theory Min. External Evaluation Total Marks Minimum Passing Marks External Evaluation Internal Evaluation Min. Internal Evaluation Practical Min. External Evaluation Total Marks Minimum Passing Marks External Evaluation Internal Evaluation Min. Internal Evaluation 13 15 8 10 5 25

Part E										
Books 1. Computer Application in Pharmacy – William E Fassett – Lea and Febiger, 600 South Washington Square, USA. (215) 922-1330.										
Articles	NA									
References Books	1. Computer Application in Pharmaceutical Research and Development – Sean Ekins – Wiley-Interscience, A John Willey and Sons, INC., Publication, USA									
MOOC Courses	NA									
Videos	NA									

	Course Articulation Matrix														
COs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	P011	PO12	PSO1	PSO2	PSO3
CO1	-	1	-	-	1	-	-	-	-	1	2	-	1	1	1
CO2	-	1	-	•	1	-	-	-	-	-	1	-	1	1	1
CO3	-	1	-	-	2	-	-	-	-	-	1	-	1	1	1
CO4	-	1	-	•	1	1	-	-	-	-	2	-	1	2	-
CO5	-	1	-	•	2	-	-	-	-	-	2	-	-	-	1
CO6	-				-	-	-	-	-		-	-			



								BPha	arm								
	Title of the	Course	Fine art a	ind Music II *													
	Course	Code	BP211T														
								Part	A								
	Yea	r	1st			Semester		2nd				Credits		L 1	T 0	P 0	C
	Course	Туре	Theory of	nly													-
	Course Ca	tegory	Generic	Elective													
	Pre-Requ	isite/s									c	Co-Requisite/s					
	Course Ou & Bloom's	tcomes s Level	CO1- St CO2- St	udy of two-dimension udy of three-dimensio	al space and its org nal space and its or	anizational possibil rganizational possit	ities(BL2-Understand bilities(BL2-Understan	i) nd)									
	Coures El	ements	Skill Dev Entrepre Employa Professe Gender Human Environr	elopment ✓ neurship X bility X onal Ethics X X /alues ✓ nent X					SDG (Goals)		SDG4(Quality education)						
,								Part	в		4						
	Mod	ıles				Cor	ntents	ran			Pe	dagogy			н	ours	
								Dert	6					1			
Modu	Modules Title									Indicative-A Experiments Interns	ABCA/PBL/ s/Field work/ ships		E	lloom's Level	I	Но	ours
1		2-D Design: 2 3-D De	esign: 2						Experiments				BL3-Apply			5	
Total Ma	arks	Mi 13	nimum Passing Ma	rks	15	External Evaluati	on 8	rt D(Marks   Theo	Distribution) ory Min. External Evalu	ation	10	rnal Evaluatior	5		Min. Internal Ev	aluation	
								Practi	ical								
Total Ma	arks	Mi	nimum Passing Ma	rks		External Evaluati	on		Min. External Evalu	ation	Inte	rnal Evaluatior			Min. Internal Ev	aluation	
		0															-
			1					Part	E		ii.						
	Bool	.5	IE Desig	i pasios zo ano 3d 3i	rentak Kotn Publ	isried by Gengage I	Learning, 2012 ISBN 1	10. 111183392	2313DN 13: 978111183393	23							-
	Reference	Books	Design P	asics: 2D and 3D (wit	h CourseMate Prin	ted Access Card) P	entak Stenhen Roth	Richard Leve	ar David A ISBN 10-0404	909971 / ISBN 13-	9780495909972						
	MOOC C	ourses	https://w	ww.coursera.org/spec	ializations/graphic-o	design	,,,,,,,,,										
	Vide	5	http://www.youtube.com/watch?v=c?f2slSplWs									-					
L																	
1	1		1	1		1	Co	urse Articul	lation Matrix	1		1				-	
COs	PO1	PO2	P03	PO4	PO5	PO6	P07	P08	PO9	PO10	P011	PO12	PSO1		PSO2	PSO3	
CO1	2	-	-	-	-	-	-	-	-	2	2	-	-		•	-	-
CO3	-	-	1.	1.		1.		-	-	1.	-	1				-	
CO4	-	-			-	-	-	-	-		-		-			-	
C05	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
1			1	1		1	1	. <u> </u>		1							



								BPharm									
	Title of the C	Course	Pharmace	eutical Organic Cher	nistry II												
	Course C	ode	BP301T														
-				1				Part A		I.			L.	т	D		c
	Year		2nd		Se	mester	3rd				Credits		2	1	r 0		4
	Course T	vne	Theory o	nlv									5		0		4
	Course Cat	egon/	Discipline	Core													
-	Pre-Requise	egory	Discipline	000						T	Co-Requisite/s		1				
	Trontequi		CO1- To	understand about ar	omaticity chemistry	and reactions of here	rene (BI 1-Reme	mher)			oonequisitess						
	Course Oute & Bloom's	comes Level	CO2- To CO3- To CO4- To CO5- To	understand the conc Account for reactivity gain knowledge on o gain knowledge on s	ept of hydrolysis, hyd //stability of compour themistry of phenols, tructure and medicin	drogenation, saponifi ads(BL3-Apply) aromatic amines and al uses of pharmace	cation and rancid d aromatic acids.( utical organic con	BL4-Analyze)	erstand) erstand)								
	Coures Eler	nents	Skill Devi Entreprei Employal Professa Gender > Human V Environm	elopment ✓ neurship X bility ✓ onal Ethics X ✓ /alues X nent X				SDG (Go	als)	SDG3(Good health ar SDG4(Quality educati	id well-being) on)						
								Part B	1								
Moo	lules				Contents						Pedag	Jogy					Hours
UNIT-I		Benzene and its or resonance in benz Friedelcrafts alkyl of mono substitute Chloramine	erivatives A. Analyt rene, aromatic char ation- reactivity, limi ad benzene compou	ical, synthetic and ot acters, Huckel's rule itations, Friedelcrafts unds towards electro	her evidences in the B. Reactions of ben acylation. C. Substit philic substitution rea	derivation of structur zene - nitration, sulph tuents, effect of subst action D. Structure an	e of benzene, Ori nonation, halogen tituents on reactiv id uses of DDT, S	bital picture, ation- reactivity, ity and orientation accharin, BHC and	Lecure based lerani	ing, Peer tutorial						10	
UNIT-II		Phenols* - Acidity naphthols Aromat Acids* - Acidity, et	of phenols, effect o c Amines* - Basicity fect of substituents	f substituents on aci y of amines, effect of on acidity and impor	dity, qualitative tests, substituents on basi tant reactions of ben	Structure and uses o icity, and synthetic us zoic acid	of phenol, cresols ies of aryl diazoni	, resorcinol, um salts Aromatic	Lecure based lerani	ing, Peer tutorial						10	
UNIT-III	Fats and Oils a. Fatty acids – reactions. b. Hydrolysis, Hydrogenation, Saponification and Rancidity of oils, Dryin constants – Acid value, Saponification value, Ester value, Jodine value, Acetyl value, Reichert Meissl (RM) value principie involved in their determination								Lecure based lerani	ing, Peer tutorial						10	
UNIT-IV		Polynuclear hydro Diphenylmethane	carbons: a. Synthe Triphenylmethane	sis, reactions b. Stru and their derivatives	cture and medicinal u	uses of Naphthalene,	, Phenanthrene, A	inthracene,	Lecure based lerani	ing, Peer tutorial						8	
UNIT-V		Cyclo alkanes* St Mohr's theory (Th	abilities – Baeyer's eory of strainless rir	strain theory, limitation ngs), reactions of cyo	on of Baeyer's strain clopropane and cyclo	theory, Coulson and butane only	Moffitt's modifica	tion, Sachse	Lecure based lerani	ing, Peer tutorial						7	
			,	5,, ,		,			1								
Modul	es				Title			Part C		Indicative-ABCA/I Experiments/Field	PBL/ work/			Bloom's Leve	əl		Hours
1	s	vnthesis and medicina	l uses of Napthelen	e.Phenanthrene				Ex	periments			BL2-Un	derstand			10	
		,		,													
							Р	art D(Marks Dis Theory	tribution)								
Total Ma	irks	Min	imum Passing Mar	rks		External Evaluation			Min. External Evalu	ation	Inte	rnal Evaluation			Min. Internal	Evaluation	n
100	5	0			75			38			25			13			
					1			Practical			1						
Total Ma	irks	Min	imum Passing Mar	rks		External Evaluation			Min. External Evalu	ation	Inte	rnal Evaluation			Min. Internal	Evaluation	n
<u> </u>																	
	Books	•	1. Organi	ic Chemistry by Morr	ison and Bovd 2. Or	ganic Chemistry by I	L. Finar, Volume-	Part E	anic Chemistry by R S	5. Bahl & Arun Bahl							
	Article	5	NA	., _,	, 01		,		,.,.,.								
References Books 1 Organic Chemistry by PL Soni 2 Practical Organic Chemistry by Mann and Saunders. 3 Voge								3 Vogel's text book	of Practical Organic C	Chemistry 4 Advanced Pr	actical organic chemis	try by N.K.Vishnoi. 5 Ir	troduction	to Organic Lab	pratory technique	s by Pavia.	Lampman
	MOOC Cou	irses	https://npi	tel.ac.in/				-		-	-			÷			
	Videos	3	youtube a	and other free resour	се												
L			1						- Matrix								
COs	P01	PO2	P03	PO4	P05	P06	P07	PO8	PO9	PO10	P011	P012	PSO1		PSO2	PS	503
C01	3	1		-	2		1	-	1	-	3		3			2	
CO2	3	1	-	-	1	-	-	-	-	-	3	-	2		-	2	
CO3								-	1	-	2	-	3		-	3	
CO4	2	1	-	-	1	-	-	-	-	-	2	-	2		1	1	
CO5	2	-	-	-	2	-		-	-	-	2	-	1		-	1	
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
1	1	1	1	1	1					1	1	1					



								BPh	arm								
	Title of the	Course	Ph	hysical Pharmaceutics I													
	Course	Code	BF	P302T													
			•		-			Par	+ Δ								
	Yes	ar	2r	nd	Semes	ter	3rd	T di		Cree	dits	L		T	P	C	
	Course	Type	T	beony only						ļ		03		1	U	4	
	Course	atagony	D	liscipling Core													
	Bro Bog	uisito/s	0							Co Bog	uisito/s						
	Course O & Bloom	utcomes s Level		01- To recollect the states 02- To gain knowledge of 03- To understand the pri 04- To elaborate the signi 05- To describe the princi	of matter and unders pH and buffers and th nciple of interfacial ter ficance of physical pre ples of diffusion in bio	stand the applications heir use in the stabiliz nsion and the applica operties of drug mole logical systems and t	s of various physic tation of pharmac tions of surface a cules in design an the the concepts of	ochemical prope eutical formulat ctive agents in nd stability of do of complexation	arties to desig ions.(BL3-Ap drug solubiliza bsage forms.( and protein b	n dosage forms(BL2-Understand) ply) blu (BL2-Understand) BL1-Remember) inding in pharmacy.(BL1-Remember)	er)						
	Coures E	lements	SI Ei Pi G Hi Ei	till Development ✓ ntrepreneurship X mployability ✓ rofessonal Ethics X iender X uman Values X invironment X				SDG (Goals)		SDG4(Quality education) SDG8(Decent work and economic	c growth)						
				-				Bor	+ P								
Modules				Contents				Par			Pedago	9 <b>y</b>					Hours
UNIT-I	Solubility of d association, o gas in liquids Critical solution	rugs: Solubility expressi juantitative approach to , solubility of liquids in liq on temperature and appl	ons, mechan the factors in quids, (Binary lications. Disl	isms of solute solvent inte ifluencing solubility of drug y solutions, ideal solutions tribution law, its limitations	aractions, ideal solubil gs, diffusion principles ) Raoult's law, real so s and applications	ity parameters, solva s in biological systems lutions. Partially misc	tion & s. Solubility of ible liquids,	Lecture base	d learning, int	eractive class, Peer tutorial, Class u	using ICT tool/PPT/white	board					10
UNIT-II	States of Mat critical point, crystalline, ar constant, dip	ter and properties of ma eutectic mixtures, gases norphous & polymorphis ole moment, dissociation	tter: State of , aerosols – i m. Physicoc n constant, de	matter, changes in the sta inhalers, relative humidity, hemical properties of drug eterminations and applica	ate of matter, latent he , liquid complexes, liqu ; molecules: Refractive tions	eats, vapour pressure uid crystals, glassy st e index, optical rotati	e, sublimation tates, solid- on, dielectric	Lecture base	d learning, int	eractive class, Peer tutorial, Class u	using ICT tool/PPT/white	board					10
UNIT-III	Surface and i interfacial ter adsorption at	nterfacial phenomenon: sions, spreading coeffici solid interface.	Liquid interfa ient, adsorpti	ace, surface & interfacial te ion at liquid interfaces, sur	ensions, surface free rface active agents, H	energy, measuremen LB Scale, solubilisati	t of surface & on, detergency,	Lecture base	d learning, int	eractive class, Peer tutorial, Class u	using ICT tool/PPT/white	board					8
UNIT-IV	Complexation Complexation	and protein binding: Int and drug action, crysta	roduction, Cl	lassification of Complexati es of complexes and therr	ion, Applications, meth modynamic treatment	hods of analysis, prot of stability constants.	tein binding,	Lecture base	d learning, int	eractive class, Peer tutorial, Class u	using ICT tool/PPT/white	board					8
UNIT-V	pH, buffers a buffer equation	nd Isotonic solutions: So on, buffer capacity, buffer	rensen's pH rs in pharma	scale, pH determination ( ceutical and biological sys	electrometric and calo stems, buffered isotoni	primetric), application ic solutions.	s of buffers,	Lecture base	d learning, int	eractive class, Peer tutorial, Class u	using ICT tool/PPT/white	board					7
								Par	t C								
Module	95				Title					Indicative-ABCA Experiments/Field Internships	VPBL/ d work/ s			Bloom's Leve	əl		Hours
UNIT-V		Guest lecture by indust	try expert						Seminar			E	BL2-Understand			2	
							F	Part D(Marks	Distributior	i)							
								The	ory					I			
Total Ma	rks	Min	iimum Passi	ing Marks		External Evaluation	n		Min. Ex	ternal Evaluation	Inter	nal Evaluation	1		Min. Internal Ev	aluation	
100		50			75			38			25			13			
								Prac	tical		- r			1			
Total Ma	rks	Min	iimum Passi	ing Marks		External Evaluation	n	ļ	Min. Ex	ternal Evaluation	Inter	mal Evaluation	1		Min. Internal Ev	aluation	
ı								Par	tE								
	Boo	ks	1.	. Physical Pharmacy by Al	fred Martin 2. Experim	nental Pharmaceutics	by Eugene, Parc	ott. 3. Tutorial Pl	harmacy by C	ooper and Gunn							
	Artic	les															
	Reference	s Books	1. 2,	Stocklosam J. Pharmaceu 3. Marcel Dekkar Inc. 4. F	utical Calculations, Le Physical Pharmaceutic	a &Febiger, Philadel cs by Ramasamy C a	phia. 2. Liberman nd ManavalanR.	H.A, Lachman	C., Pharmace	utical Dosage forms, Tablets, Volun	ne-1 to 3, MarcelDekkar I	nc. 3. Libermar	h H.A, Lachman	C, Pharmaceutic	al Dosage forms. Dis	perse syste	ms, volume 1,
	MOOC C	ourses	htt	tps://nptel.ac.in/													
	Vide	os	Ya	ou tube													
t						1	(	Course Articu	lation Matri	x		1			1	- 1	
COs	P01	PO2	PO3	PO4	P05	P06	P07	PO8	PO9	PO10	P011	PO12	PSO	1	PS02	PSO3	
001	2	2	3		2	-	-	-	-	-	3	-	3		-	1	
602	2	3	2	-	11	1-	1-	1-	-	1-	3	1-	2		1-	2	

CO1	2	2	3	-	2	-	-	-	-	-	3	-	3	-	1
CO2	2	3	2	-	1	-	-	-	-	-	3	-	2	-	2
CO3	2	2	3	-	2	-	•	-	-	-	3	-	1	2	3
CO4	2	1	3	-	2	1	-	-	-	-	3	-	1	1	3
CO5	1	2	3	-	1	-	•	-	-	-	3	-	3	-	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



								BPharn	ı									
	Title of the	Course	Pharmace	utical Microbiology														
	Course 0	Code	BP303T															
L			1															
							1	Part A					L		т	Р	с	
	Year		2nd		Semes	ter	3rd				Cred	lits	3		1	0	4	
	Course 1	Гуре	Theory or	nly														
	Course Ca	tegory	Discipline	Core														
	Pre-Requi	site/s	basic und	lerstanding of cell an	id biology						Co-Requ	iisite/s						
	Course Out & Bloom's	comes Level	CO1- Und CO2- To U CO3- To U CO4- Car CO5- Und	derstand methods of understand the impo Learn sterility testing ried out microbiolog derstand the cell cult	identification, cultiv rtance and impleme of pharmaceutical p ical standardization ure technology and	ation and preservatio ntation of sterlization products(BL3-Apply) of Pharmaceuticals(E its applications in pha	n of various micr in pharmaceutic <b>BL4-Analyze)</b> armaceutical ind	oorganisms(BL2-U al processing and i ustries(BL2-Under	nderstand ndustry(BL stand)	) 2-Understan	id)							
	Coures Ele	ments	Skill Deve Entrepren Employab Professor Gender X Human V Environm	elopment √ neurship X pility √ pnal Ethics X alues X ent √				SDG (Goals)		SDG4(Qua SDG6(Clea SDG8(Dec	ality education) an water and sanitation) ænt work and economic	growth)						
								Part B										
Modules				Contents								Pedagog	1Y					Hours
UNIT-I	Introduction, his structure and m parameters for measurement o and electron mi	tory of microbiology, its orphological classification growth, growth curve, is f bacterial growth (total croscopy.	branches, scope ar on of bacteria, nutrit plation and preserv & viable count). Stu	nd its importance. In tional requirements, ation methods for pu idy of different types	troduction to Prokar raw materials used ire cultures, cultivati of phase contrast n	yotes and Eukaryotes for culture media and on of anaerobes, qua nicroscopy, dark field	s Study of ultra- I physical antitative microscopy	Lecture based lea	ıming, inter	active class,	Peer tutorial, Class usir	ng ICT tool/PPT/white b	oard					10
UNIT-II	Identification of principle, proce Evaluation of th	bacteria using staining f dure, merits, demerits a e efficiency of sterilization	echniques (simple, nd applications of p on methods.	Gram's & Acid -fast hysical, chemical ga	staining) and bioch seous, radiation and	emical tests (IMViC). d mechanical method	Study of I of sterilization.	Lecture based lea	rning, inter	active class,	Peer tutorial, Class usir	ng ICT tool/PPT/white b	oard/PPT					10
UNIT-III	Study of morpho disinfectants Fa bactericidal & B USP.	ology, classification, rep ctors influencing disinfe acteriostatic. Sterility te	Peer tutorial, Class usir	ng ICT tool/PPT/white b	oard					10								
UNIT-IV	Designing of as prevention, clea antibiotics, vitar	eptic area, laminar flow n area classification. Pr nins and amino acids. A	equipments; study inciples and metho ssessment of a nev	of different sources ds of different microl v antibiotic.	of contamination in a piological assay. Me	an aseptic area and r thods for standardiza	nethods of tion of	Lecture based lea	irning, inter	active class,	Peer tutorial, Class usir	ng ICT tool/PPT/white b	oard					8
UNIT-V	Types of spoilag assessment of r microbial stabili transformed cel	ge, factors affecting the microbial contamination ty of formulations. Grow I cultures. Application of	microbial spoilage o and spoilage. Pres th of animal cells in cell cultures in pha	of pharmaceutical pr ervation of pharmac culture, general pro rmaceutical industry	oducts, sources and eutical products usir cedure for cell cultu and research	l types of microbial co ng antimicrobial agen re, Primary, establish	ontaminants, ts, evaluation of ied and	Lecture based lea	iming, inter	active class,	Peer tutorial, Class usir	ng ICT tool/PPT/white b	oard					7
								Part C										
Modu	les				Title						Indicative-ABCA Experiments/Field Internships	/PBL/ i work/			Bloom's Lev	rel	н	ours
1		Microbiological visit of F	harma industry					V	irtual Labs					BL3-Apply			5	
								Part D(Marks Di	stribution	)								
Total Ma	arks	Mini	num Passing Mar	ks		External Evaluation	1		Min. Ext	ernal Evalua	ation	Inter	nal Evaluation			Min. Internal Eva	luation	
100		50			75			38				25			13			
					1.7			Practica	1			1			17			
Total Ma	arks	Mini	num Passing Mar	ks		External Evaluation	1		Min. Ext	ernal Evalua	ation	Inter	nal Evaluation			Min. Internal Eva	luation	
	Book	s	1. W.B. H Ananthna	ugo and A.D. Russe rayan : Text Book of	I: Pharmaceutical M Microbiology, Orien	icrobiology, Blackwel t-Longman, Chennai	Il Scientific public	Part E ations, Oxford Lon	ion. 2. Pre	scott and Dur	nn., Industrial Microbiolo	ogy, 4th edition, CBS Pu	ublishers & Distr	ibutors, Delhi.	. 3. Pelczar, Chan	Kreig, Microbiology, Ta	ta McGraw	Hill edn. 4.
	Article	s	https://byj	us.com/biology/micro	biology/													
	References	Books	1. Malcoln	n Harris, Balliere Tin Technology 6 J.P. 5	dall and Cox: Pharn	naceutical Microbiolog	gy. 2. Rose: Indu	strial Microbiology.	3. Probishe	er, Hinsdill et	al: Fundamentals of Mic	crobiology, 9th ed. Japa	n 4. Cooper and	d Gunn's: Tuto	orial Pharmacy, CB	S Publisher and Distril	oution. 5. Pe	appler:
	MODE Courses http://doi.org/10.1111/001111111111111111111111111111																	
	Video	e	https://www	w voutube com/wat	b2v=lian∐l4i bo8ii	st=PI OnNvE1lvA/\\/	(155ban4kaneA/lb	PNiifT										
L	video	-	nips.//ww	, ou un o o o o o o o o o o o o o o o o o			onag-maprimi	Course Articulat	on Matrix	r								
COs	PO1	PO2	P03	PO4	PO5	P06	P07	PO8	PO9		PO10	P011	PO12	PSC	D1	PSO2	PSO3	
CO1	3	1		1	2	-	-	-	-		-	3	-	3		-	3	
CO2	3	2	-	1	2	-	-	-	-		-	3	-	2		-	2	
CO3	2	1		-	1	1	-	-	-		-	3	-	2		-	2	
CO4	2	2		-	2	-	-	-	-		-	3	-	2		-	2	
CO5	2	1	-	-	1	-	-	-	-		-	3	-	1		-	3	
CO6				-	-		-	-	-		-	-	-	-		-	-	



					Di ha									
	Title of the Course	Pharmaceutical Eng	ineering											
	Course Code	BP304T												
					Part	A								
							L	т	Ρ	С				
	Year	2nd	Semester	3rd		Credits	3	1	0	4				
	Course Type	Theory only				-		•	*					
	Course Category	Discipline Core												
	Pre-Requisite/s					Co-Requisite/s								
	Course Outcomes & Bloom's Level	CO1- To know vario CO2- To understand CO3- To perform va CO4- To carry out v CO5- To appreciate	us unit operations used in pharmaceutical in d the material handling techniques( <b>BL2-Und</b> trious processes involved in pharmaceutical arious test to prevent environmental pollutior the various preventive methods used for cor	idustries(BL1-Remen erstand) manufacturing proces n(BL3-Apply) rrosion control in phar	mber) ss(BL3-Apply) irmaceutical industri	es.(BL2-Understand)								
	Coures Elements	Skill Development J Entrepreneurship J Employability J Professonal Ethics Gender X Human Values X Environment X	×	SDG	(Goals)	SDG4(Quality aducation) SDG8(Decent work and economic growth) SDG8(Industry Innovation and Infrastructure) SDG12(Responsible consuption and production)								
		·			Part	3								
Modules         Contents         Part B         Hours														
UNIT-I	Modules         Contents         Contents         Pedagogy         Hours           Hours         Vision fluids: Types of manometers, Reynolds number and its significance, Bernoull's theorem and its applications, Energy losses, Confice meter, Venturimeter, Pilot tube and Rotometer. Size Reduction: Objectives, Mechanisms & Laws governing size reduction, Insclors affecting size reduction, working, uses, merits and demetits of Hammer mill, ball million energy million porders, eleven size soparation Principles, construction, working, uses, ments and demetits of Sieve shaker, cyclone separator, Filot stated and on personality, generator, Bag filter & elutration tanks, and demetits of Sieve shaker, cyclone separator, Principles, Construction, working, uses, ments and demetits of Sieve shaker, cyclone separator, Principles, Construction, working, uses, ments and demetits of Sieve shaker, cyclone separator, Principles, Construction, working, uses, ments and demetits of Sieve shaker, cyclone separator, Principles, Construction, working, uses, ments and demetits of Sieve shaker, cyclone separator, Principles, Construction, working, uses, ments and demetits of Sieve shaker, cyclone separator, Principles, Construction, working, uses, ments and demetits of Sieve shaker, cyclone separator, Principles, Construction, Working, uses, ments and demetits of Sieve shaker, cyclone separator, Principles, Construction, Working, Uses, Ments and demetits of Sieve shaker, cyclone separator, Principles, Construction, Working, Uses, Ments and Sieve shaker, cyclone separator, Principles, Construction, Working, Uses, Ments and Demetits of Sieve shaker, cyclone separator, Principles, Construction, Working, Uses, Ments and Demetits of Sieve shaker, cyclone separator, Principles, Construction, Working, Uses, Ments and Demetits of Sieve shaker, cyclone separator, Principles, Construction, Sieve shaker, cyclone separator, Principles, Construction, Working													
UNIT 2	Heat Transfer: Objectives, applications & Heat interchangers & heat exchangers. E evaporation and other heat process. prin tube evaporator. climbing film evaporator evaporator. Distillation: Basic Principles reduced pressure, steam distillation & m	Heat transfer mechanisms. F vaporation: Objectives, appli iples, construction, working, forced circulation evaporato and methodology of simple dis lecular distillation	Fourier's law, Heat transfer by conduction, co cations and factors influencing evaporation, uses, merits and demerits of Steam jacketec r, multiple effect evaporator& Economy of m stillation, flash distillation, fractional distillation	nvection & radiation. differences between d kettle, horizontal ultiple effect n, distillation under	Lecture based le	rning, interactive class, Peer tutorial, Class using ICT tool/PPT/white	board				10			
UNIT 3	Drying: Objectives, applications & meche drying curve. principles, construction, wo vacuum dryer, freeze dryer. Mixing: Obje mechanism of solid mixing, liquids mixing Double cone blender, twin shell blender, Silverson Emulsifier,	nism of drying process, meas king, uses, merits and demer tives, applications & factors and semisolids mixing. Princ bbon blender, Sigma blade r	surements & applications of Equilibrium Mois rits of Tray dryer, drum dryer spray dryer, fui affecting mixing, Difference between solid an ziples, Construction, Working, uses, Merits a mixer, planetary mixers, Propellers, Turbines	sture content, rate of idized bed dryer, ad liquid mixing, nd Demerits of s, Paddles &	Lecture based le	arning, interactive class, Peer tutorial, Class using ICT tool/PPT/white	board, Peer tutorial	1			10			
UNIT 4	Filtration: Objectives, applications, Theor Uses, Merits and demerits of plate & fram filter. Centrifugation: Objectives, principle of Perforated basket centrifuge, Non-perf	es & Factors influencing filtra e filter, filter leaf, rotary drum & applications of Centrifugat prated basket centrifuge, sen	ation, filter aids, filter medias. Principle, Cons n filter, Meta filter & Cartridge filter, membrane ion, principles, construction, working, uses, r ni continuous centrifuge & super centrifuge.	truction, Working, e filters and Seidtz merits and demerits	Lecture based le	arning, interactive class, Peer tutorial, Class using ICT tool/PPT/white	board, Peer tutorial				08			
UNIT 5	Materials of pharmacoulical plant construction, Corrosion and Bs prevention: Factors affecting during materials selected for Pharmacoulical plant construction. There is of constroint, Types of corrosion and there prevention. Ferrous and nonferrous metals, index of a material banding systems.													
					Part	o								
Mo	lules		Title			Indicative-ABCA/PBL/ Experiments/Field work/ Internships		Bloom's L	Level	н	ours			
1	To understand the basis	s principle of distillation				Experiments	E	BL3-Apply		2				
[					Part D(Marks D	istribution)								

Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation
100	50	75	38	25	13
			Practical		
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation

								Part E							
	В	ooks	1. Phan	naceutical engineeri	ng principles and pra	ctices - C.V.S Sub	rahmanyam et al., L	atest edition. 2. Ren	nington practice	of pharmacy- Martin, L	atest edition. 3. Theory	r and practice of industrial p	pharmacy by Lachmar	nn., Latest edition	
	Ar	ticles	NA												
	Referen	ces Books	1.Solid p	hase extraction, Pri	nciples, techniques a	nd applications by	Nigel J.K. Simpson-	Latest edition. 2. Ur	it operation of c	hemical engineering -	Mcabe Smith, Latest e	dition 3. Cooper and Gunn'	's Tutorial pharmacy,	S.J. Carter, Latest edition	
MOOC Courses https://rptel.ac.in/															
	Vi	deos	https://w	ww.youtube.com/wa	tch?v=Ey9M1neDgx	0&list=PLNiSYvRo	kSxtpOvMxwzQlnhv	vmXt8tzpU							
								ourse Articulatio	n Matrix						
1	1		1	1	1	1		iouroo, a tioulatio					1		
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3

008	FOI	102	F 05	1.04	103	FOO	FOI	100	108	1010	FOIL	1012	F301	F 302	F 303
CO1	3	3	-	-	2	-	-	-	-	-	3	-	2	-	1
CO2	2	2	1	•	-	2		-	-	-	3	-	2		2
CO3	2	3	-	-	1	2	-	-	-	-	2	-	2	-	1
CO4	3	2	2	•	-	2		-	-	-	2	-	1	1	1
CO5	2	1	-	1	1	2	-	-	-	-	1	-	1	-	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



			BPharm									
Title of the Course	Pharmaceutical Organ	ic Chemistry II										
Course Code	BP305P											
			Part A									
Vear	2nd	Semester	3rd	Credits	L	т	Р	С				
160	210	Semester	514	Credita	0	0	4	4				
Course Type	Lab only											
Course Category	Discipline Core											
Pre-Requisite/s	Co-Requisite/s											
Course Outcomes & Bloom's Level	CO1- To gain the know CO2- To remember ar CO3- To identify the p CO4- To analyze nam CO5- To test the know	wledge on different recrystalization and steam di nd recall the different laboratory techniques used urity of fats and oils by acid value, saponification de reactions like perkin and claisen schmidt reac wledge on different electrophilic aromatic substitu	stillation techniques. (BL2-Understand) in pharmaceutical chemistry. (BL1-Remembe value and iodine value and perform various r ctions by using carbony (compounds(BL4-Ana tions reactions like bromination, nitration in m	r) eaction like diazotization, oxidation reactions (BL3-Apply) lyze) nosubstituted aromatic compounds(BL5-Evaluate)								
Coures Elements	Skill Development / Entropreneurship / Employability / Professional Ethics X Gender X Human Values X Entroprenent X											
			Part B					-				

	Par	tC		
Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	I Experiments involving laboratory techniques • Recrystallization • Steam distillation	Experiments	BL3-Apply	8
2	II Determination of following oil values (including standardization of reagents) + Acid value + Saponification value + Iodine value	Experiments	BL5-Evaluate	8
3	III Preparation of compounds • Benzanilide/Phenyl benzoate/Acetanilide from Aniline/ Phenol /Aniline by acylation reaction.	Experiments	BL3-Apply	8
4	2.4.6-Tribromo aniline/Para bromo acetanilide from Aniline/ • Acetanilide by halogenation (Bromination) reaction. • 5-Nitro salicylic acid/Meta di nitro benzene from Salicylic acid / Nitro benzene by nitration reaction	Experiments	BL3-Apply	8
5	Benzoic acid from Benzyl chloride by oxidation reaction. • Benzoic acid/ Salicylic acid from alkyl benzoate/ alkyl salicylate by hydrolysis reaction. • 1-Phenyl azo-2-napthol from Aniline by diazotization and coupling reactions.	Experiments	BL3-Apply	8
6	Benzil from Benzoin by oxidation reaction. • Dibenzal acetone from Benzaldehyde by Claison Schmidt reaction • Cinnammic acid from Benzaldehyde by Perkin reaction • P-lodo benzoic acid from P-amino benzoic acid	Experiments	BL4-Analyze	

Pedagogy

Hours

Contents

				F	Part D(Marks Distribution)					
					Theory					
Total I	Marks	Minimum Pa	ssing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation			
-										
					Practical					
Total I	Total Narks         Minimum Passing Marks         External Evaluation         Internal Evaluation         Min. Internal Evaluation									
50		25		35	18	15	8			
					Part E					
	Boo	oks	1. Practical Organic Chemistry b	y Mann and Saunders. 2. Vogel's text book of Practical	Organic Chemistry					
	Artic	cles	NA							
	Reference	es Books	1. Advanced Practical organic ch	emistry by N.K.Vishnoi. 2. Introduction to Organic Labo	ratory techniques by Pavia, Lampman and Kriz					
	MOOC	Courses	NA							

Videos You tube, simulation

Modules

	Course Articulation Matrix														
COs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	•	2	1	-	-	-	-	-	3	-	1	-	3
CO2	2	3	-	2	1	-	-	-	-	-	2	-	2	-	3
CO3	3	1	-	-	2	-	-	2	-	-	2	-	1	1	1
CO4	2	2	-	1	-	-	-	-	-	-	3	-	1	1	1
CO5	3	1	-	1	-	-	-	-	-	-	1	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



				Brian	m						
Title of the	Course	Physical Pharmaceutic	hamaceutics I								
Course	Code	BP306P									
				Part	Ą						
Voa		and	Somester	2rd		Cradita	LT	. Ŀ	>	с	
ica		2110	Semester	510	03 1 0 4						
Course	Туре	Lab only									
Course Ca	Course Category Discipline Core										
Pre-Requ	isite/s		Co-Requisite/s								
Course Ou & Bloom's	CO1- To understand the significance of physical properties such as solubility, surface tension, partition cellicient and pKa in the design of dosage forms(BL2-Understand) CO2 To explain adsorption indotems and determine Freundich-Langmit constant using addivated charcoal. (BL2-Understand) & Bloom's Level CO3- To apply therefores Or Hassebland equation for interpretation of PA value of drags(BL3-Apply) CO4- To determine the surface tension of sample liquids by drop count and drop weight methods and (BL2-Statuate) CO5- To estimate the stability constants of complexes by solubility and pH thatform methods and (BL2-Statuate)										
Coures El	ements	Skill Development J Entrepreneurship X Employability J Professional Erics X Gender X Human Values X Environment X				SDG4(Quality education) SDG8(Decent work and economic growth)					
				Part	В						
Mode	Modules Contents					Pedagogy Hours					
				Part	0						
Modules	Modules Title				Indicative-ABCA/PBL/ Evandmente/Field work/ Bloom's Level Hours						

		Internships		
1	<ol> <li>Determination the solubility of drug at room temperature 4 Hrs/week 2. Determination of pKa value by Half Neutralization/ Henderson Hasselbalch equation.</li> </ol>	Experiments	BL3-Apply	8
2	3. Determination of Partition co- efficient of benzoic acid in benzene and water 4. Determination of Partition co- efficient of lodine in CCH and water	Experiments	BL4-Analyze	8
3	<ol> <li>Determination of % composition of NaCl in a solution using phenol-water system by CST method 6. Determination of surface tension of given liquids by drop count and drop weight method</li> </ol>	Experiments	BL4-Analyze	8
4	7. Determination of HLB number of a surfactant by saponification method 8. Determination of Freundlich and Langmuir constants using activated char coal	Experiments	BL4-Analyze	8
5	<ol> <li>Determination of critical micellar concentration of surfactants 10. Determination of stability constant and donor acceptor ratio of PABA-Caffeine complex by solubility method</li> </ol>	Experiments	BL4-Analyze	4
6	11 Determination of stability constant and donor acceptor ratio of Cupric-Glycine complex by pH titration method	Experiments	BI 4-Analyze	8

#### Part D(Marks Distribution) Theory Min. External Evaluation External Evaluation Internal Evaluation Total Marks Minimum Passing Marks Min. Internal Evaluation 50 35 15 8 100 18 Practical Total Marks Minimum Passing Marks External Evaluation Min. External Evaluation Internal Evaluation Min. Internal Evaluation

	Part E
Books	1. Laboratory Manual of Physical Pharmaceutics, C.V.S. Subramanyam, J. Thimma settee
Articles	NA
References Books	1. Physical Pharmaceutics by Ramasamy C and ManavalanR.
MOOC Courses	NA
Videos	NA

	Course Articulation Matrix														
COs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	P011	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	1	1		-	-	-	-	3	-	2	2	3
CO2	3	2	1	-	1	-	-	-	-	-	3	-	2	1	1
CO3	2	1	1	1	2	-	-	-	1	-	1	-	-	1	2
CO4	2	2	2	-	1	-	-	-	1	-	2	-	1	1	1
CO5	1	1	3	1	-	-	1	-	-	-	2	-	-	-	1
CO6	-	-				-	-	-	-			-		-	



			BPharm					
Title of the Course	Pharmaceutical Microbiology	/						
Course Code	BP307P							
			Part A					
Voar	2nd	Semester	3rd	Credite	L	т	Ρ	С
100	210	Concorter	54	0.0010	0	0	4	4
Course Type	Lab only							
Course Category	Discipline Core					-		
Pre-Requisite/s				Co-Requisite/s				
Course Outcomes & Bloom's Level	CO1- Understand methods of CO2- To Learn sterility testin CO3- Carried out microbiolo CO4- To demonstrate variou CO5- To choose the correct	of identification, cultivation and preservation of various microo go fpharmaceutical products( <b>BL3-Apply</b> ) gical standardization of Pharmaceuticals( <b>BL4-Analyze</b> ) s staining methods – simple, gram staining and acid fast stair method to evaluate the microbes to be tested( <b>BL5-Evaluate</b> )	rganisms(BL2-Understand) ing(BL3-Apply)					
Coures Elements	Skill Development ✓ Entrepreneurship × Employability × Professonal Ethics × Gender × Human Values × Environment ×		SDG (Goals)	SDG4(Quality education)				

# Part B

Pedagogy

Hours

Contents

Modules

	Pa	rt C		
Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Introduction and study of different equipments and processing, e.g., B.O.D. incubator, laminar flow, aseptic hood, autoclave, hot air sterilizer, deep freezer, refrigerator, microscopes used in experimental microbiology	Experiments	BL2-Understand	4
2	Sub culturing of bacteria and fungus. Nutrient stabs and slants preparations	Experiments	BL3-Apply	4
3	Staining methods- Simple, Grams staining and acid-fast staining (Demonstration with practical).	Experiments	BL3-Apply	4
4	Isolation of pure culture of micro-organisms by multiple streak plate technique and other techniques.	Experiments	BL4-Analyze	4
5	Microbiological assay of antibiotics by cup plate method and other methods	Experiments	BL5-Evaluate	4
6	Motility determination by Hanging drop method	Experiments	BL5-Evaluate	4
7	Sterility testing of pharmaceuticals	Experiments	BL5-Evaluate	4
8	Bacteriological analysis of water	Experiments	BL5-Evaluate	4

	Part D(Marks Distribution)									
	Theory									
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation					
	50	35	18	15	8					
			Practical							
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation					

Part E							
Books	1. W.B. Hugo and A.D. Russel: Pharmaceutical Microbiology, Blackwell Scientific publications, Oxford London. 2. Prescott and Dunn., Industrial Microbiology, 4th edition, CBS Publishers & Distributors, Delhi.						
Articles	NA						
References Books	1. Lab manual						
MOOC Courses	NA						
Videos	NA						

	Course Articulation Matrix														
COs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3			1	-	-	-	-	-	3	-	2	-	3
CO2	2	2	-	-	2	-	-	1	-	-	2	-	2	-	2
CO3	3	2	1		1	-	1	-	-	-	3	-	1	-	2
CO4	3	2	1	1	1	1	-	1	-	-	3	-	1	2	1
CO5	2	3	1		1	-	1	-	-	-	3	-	1	1	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



			BPharm						
Title of the Course	Pharmaceutical Engineering								
Course Code	BP308P								
			Part A						
Year	2nd	Semester	3rd	Credits	L	т	Р	с	
					0	0	4	4	
Course Type	Lab only								
Course Category	Discipline Core								
Pre-Requisite/s	Pre-Requisite/s Co-Requisite/s								
Course Outcomes & Bloom's Level	CO1- To know various unit of CO2- To demonstrate and ex CO3- To experiment with the CO4- To determine overall h CO5- To estimate moisture of	sparations used in pharmacoutical industries(B1.2.Junderstams xplain about the construction, working and applications of pha- process variables of filtration, evaporation and infer the sam leaf transfer coefficient by heat exchanger and calculate the content, loss on drying and construct drying curves for calcu-	d) armaceutical equipments such as colloid mill, planetary mix e(BL3-Apply) fifciency of steam distillation(BL4-Analyze) n carbonate and starch(BL5-Evaluate)	ver, fluidized bed dryer and freeze dryer.(BL3-Apply)					
Coures Elements	Skill Development V Entrepreneurship V Employability V Professsonal Ethics X Gender X Human Values X Environment X		SDG (Goals)	SDG4(Quality education)					

# Part B

Pedagogy

Hours

Contents

Modules

	Pa	rt C		
Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	I. Determination of radiation constant of brass, iron, unpainted and painted glass	Experiments	BL2-Understand	6
2	II. Steam distillation – To calculate the efficiency of steam distillation	Experiments	BL3-Apply	6
3	<ol> <li>To determine the overall heat transfer coefficient by heat exchanger. IV. Construction of drying curves (for calcium carbonate and starch).</li> </ol>	Experiments	BL2-Understand	6
4	V. Determination of moisture content and loss on drying. VI. Determination of humidity of air – i) From wet and dry bulb temperatures – use of Dew point method	Experiments	BL3-Apply	6
5	VII. Description of Construction working and application of Pharmaceutical Machinery such as rotary tablet machine, fluidized bed coater, fluid energy mill, de humidifier, VIII. Size analysis by sieving – To evaluate size distribution of tablet granulations – Construction of various size frequency curves including arithmetic and logarithmic probability plots	Experiments	BL3-Apply	6
6	IX. Size reduction: To verify the laws of size reduction using ball mill and determining Kicks, Rittinger's, Bond's coefficients, power requirement and critical speed of Ball Mill. X. Demonstration of colloid mill, planetary mixer, fluidized bed dryer, freeze dryer and such other major equipment	Experiments	BL3-Apply	6
7	XI. Factors affecting Rate of Filtration and Evaporation (Surface area, Concentration and Thickness/viscosity XII. To study the effect of time on the Rate of Crystallization	Experiments	BL3-Apply	6
8	XIII. To calculate the uniformity Index for given sample by using Double Cone Blender.	Experiments	BL3-Apply	6

### Part D(Marks Distribution)

	Theory												
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation								
Practical													
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation								
50	25	35	18	15	8								

	Part E											
Books 1. Pharmaceutical engineering principles and practices – C.V.S Subrahmanyam et al., Latest edition. 2. Remington practice of pharmacy-Martin, Latest edition.												
Articles	NA											
References Books	1. Theory and practice of industrial pharmacy by Lachmann., Latest edition. 2. Physical pharmaceutics- C.V.S Subrahmanyam et al., Latest edition											
MOOC Courses	NA											
Videos	NA											

	Course Articulation Matrix														
COs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	1	1	-	-	-	-	-	3	-	2	-	2
CO2	2	3	2	2	2	-	-	-	-	-	3	-	2	-	2
CO3	3	2	1	1	1	-	-	-	-	-	2	-	1	-	3
CO4	2	2	1	1	2	-	-	-	-	-	2	-	3	1	2
CO5	3	1	1	-	1	-	-	-	-	-	1	-	1	1	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



								BPha	arm									
	Title of the	Course	Fine art	and Music III/online of	ertification course *													
	Course	Code	BP309T	ſ														
								Par	tA									
	Ve	ar	2nd			Semester		3rd				Credits		L	T	Ρ	С	
	10		2110			Genicoter		ord				oreans		0	0	1	1	
	Course	Туре	Theory	only														
	Course C	ategory	Generic	c Elective														
	Pre-Req	uisite/s	001.0	······································			tion Church of these of			ikilii(DL 2 Ll-	decentered)	Co-Requisite	/s					
	& Bloom	's Level	CO2- S	tudy of three-dimension	onal space and its of	organizational possibli	ilities(BL2-Understa	ind)	ace and its organizational (	possibilities(BL2-Un	derstand)							
	Skil ueveepment 3 Enterpreneurship X Employability X Professional Ethics X Gender X Human Values J Environment X								SDG (Goals)		SDG4(Quality education	n)						
								Par	B									
	Mod	ules				Con	ntents	ı dı			Pedagogy Hours							
				Part C														
Module	es				Title			, u		Indicative-ABCA/PBL/ Experiments/Field work/ Internships				Bloom's Level			Hours	
1		2-D Design: 2 3-D Des	ign: 2						PBL				BL2-Understand			4		
Total Ma	ırks	Mi	nimum Passing M	arks		External Evaluation	Pa	art D(Marks The	Distribution) ory Min. External Evalu	ation		nternal Evaluat	ion		Min. Internal E	valuation		
25					20			10			5			2				
								Pract	ical									
Total Ma	irks	Mi	nimum Passing M	arks	-	External Evaluation	on		Min. External Evalu	ation		nternal Evaluat	ion		Min. Internal E	valuation		
		U	1					Par	Ε									
	Boo	ks																
L	Reference	s Books																
	MOOC C	ourses																
	Vide	os																
					_		C	ourse Articu	lation Matrix	_								
COs	PO1	PO2	PO3	PO4	P05	P06	P07	PO8	PO9	PO10	P011	P012	PSO1		PSO2	PSO3		
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-		
CO2	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-		
CO3	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-		
CO4	-	-	-	· · · · · · ·						-	-	-	-		-	-		
005	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-		
000	1	1-	1	1	1	1-	T	17	-	1-	1-	-	-		1-	-		



			BPharm																
	Title of the	Course		Pharmace	utical Organic Cherr	nistry III													
	Course (	Code		BP401T															
<u> </u>				1					Bort	•									
									Tar	n						L	т	Р	с
	Year	r		2nd			Semester		4th					Credits		3	1	0	4
-	Course	Туре		Theory on	ly													-	
	Course Ca	itegory		Discipline	Core														
	Pre-Requi	isite/s											c	o-Requisite/s					
	Course Ou & Bloom's	tcomes s Level		CO1- To u CO2- To u CO3- To ic CO4- To e CO5- To e	nderstand the nome nderstand the funda dentify medicinal use xplain stereo isome laborate the reactio	anclature, properties amentals of stereo cl as and other applica rism in biphenyl com ns and synthetic imp	and methods of pre hemical aspects(BL2 tions of organic com apounds and condition ortance of metal hyperters of the second sector of the second second second second second second second second second second secon	paration of heterocy 2-Understand) pounds. (BL3-Apply ons for optical activit dride reduction (NaB	clic compound ) y. <b>(BL1-Reme</b> IH4 & LiAIH4).	is. (BL2-Understa nber) Clemmensen red	nd) uction, Oppenauer	r oxidation	and Beckmann rearrange	ment. (BL2-Unders	stand)	I			
	Coures Elé	ements		Skill Devel Entreprene Employabi Professsor Gender X Human Va Environme	lopment ✓ eurship X ility X nal Ethics X ilues X ant X					SDG (Go	als)	s	3DG4(Quality education)						
									Part	в									
	Modules					0	Contents						Peda	igogy				Ho	ours
UNIT-I			Stereo isor chiral and isomers Re absolute	merism Optica achiral molec aactions of ch	al isomerism – Optio ules DL system of n iiral molecules Race	al activity, enantiom omenclature of optio mic modification an	erism, diastereoison al isomers, sequenc d resolution of racen	nerism, meso compi ce rules, RS system nic mixture. Asymme	ounds Elemen of nomenclatu atric synthesis	ts of symmetry, re of optical partial and	WHITEBOARD						10		
UNIT-II			Geometric configurati compound	al isomerism on of geomet s (Atropisome	Nomenclature of ge rical isomers. Confo erism) and condition	ometrical isomers (0 rmational isomerism s for optical activity.	Cis Trans, EZ, Syn A in Ethane, n-Butane Stereospecific and s	nti systems) Method e and Cyclohexane. stereoselective reac	ls of determina Stereo isome tions	ition of ism in biphenyl	WHITEBOARD	PPT					10		
UNIT-III			Heterocycl Pyrrole, Fu	ic compounds Iran, and Thic	s: Nomenclature an ophene Relative aro	d classification Syntl maticity and reactivi	nesis, reactions and ty of Pyrrole, Furan a	medicinal uses of fo and Thiophene	llowing comp	wing compounds/derivatives WHITEBOARD/PPT					10				
UNIT-IV			Synthesis, Quinoline, their deriva	reactions and Isoquinoline, atives	d medicinal uses of Acridine and Indole	following compound . Basicity of pyridine	s/derivatives Pyrazo Synthesis and medi	le, Imidazole, Oxazo icinal uses of Pyrimi	ole and Thiazo dine, Purine, a	le. Pyridine, zepines and	WHITEBOARD/	PPT					8		
UNIT-V			Reactions reduction. condensati	of synthetic ir Oppenauer-o ion	mportance Metal hy xidation and Dakin i	dride reduction (NaB reaction. Beckmann:	H4 and LiAlH4), Cle s rearrangement and	mmensen reduction I Schmidt rearrange	, Birch reduct ment. Claisen	on, Wolff Kishner Schmidt	WHITEBOARD/	PPT					7		
									Part	c									
Modul	les					Title				-	India Exper	cative-AB riments/Fi Internsh	CA/PBL/ ield work/ ips			Bloom's Leve	el		Hours
UNIT-IV		synthesis and me	dicinal uses	pyrimidine						PBL								5	
								Pa	rt D(Marks I	Distribution)									
									Theo	У									
Total Ma	arks		Minimum F	assing Mark	(5		External Evaluation	ı		Min. Externa	Evaluation		Inter	nal Evaluation			Min. Interna	I Evaluatio	n
100	1	50				75		3	18				25			13			
									Practi	cal									
Total Ma	arks		Minimum F	assing Marl	s		External Evaluation	1		Min. Externa	Evaluation		Inter	nai Evaluation			Min. Interna	i ⊨valuatio	n
													· ·						
1				1					Part	E									
	Book	s		1. Organic	chemistry by I.L. Fi	nar, Volume-I & II. 2	. A text book of orga	nıc chemistry – Arur	Bahl, B.S. Ba	hl. 3. Heterocyclic	Chemistry by Raj	K. Bansal	1						
	Article	es Deele		NA .	Chaminta 1 11		eren eren eren eren eren eren eren eren	IN THE COLUMN											
	References	Books		1. Organic	unemistry by Morri	son and Boyd 2. Hel	erocyclic Chemistry	by I.L. Gilchrist											
MOOC Courses https://nptel.ac.m/																			
	video	10		TOU LUDE															
								Co	urse Articul	ation Matrix									
COs	PO1	PO2	PO3		PO4	P05	P06	P07	PO8	PO9	PO10		PO11	P012	PSO1		PSO2	P	SO3
CO1	3	3	3		-	1	-	-	-	2	-		2	-	3		1	3	
CO2	2	1	2	2 - 2					-	1	-		2	-	2		-	2	
CO3	2	2	2 - 3					-	-	-		2	-	3		1	2		
CO4	2	-	2						-	-	-		3	-	2		-	1	
CO5	3	-	-		-	1	-	-	-	-	-		2	-	1		-	1	
CO6	-	-	-		-	-	-	-	-	-		-	-	-		-	-		



Title of the Course	Medicinal Chemistry	In the second seco											
Course Code	BP402T												
	PartA												
Vear	2nd	Somester	4th	Credite	L	т	Ρ	С					
100	2.10	ounication		0,00,00	3	1	0	4					
Course Type	Theory only												
Course Category	Discipline Core	3 Core											
Pre-Requisite/s		Co-Requisite/s											
Course Outcomes & Bloom's Level	CO1- To recall the v. CO2- To explain the CO3- To identify the CO4- To categorize CO5- To design and	arious classes of medicinal compounds(BL1 physicochemical properties, steric aspects structural requirements of drugs to elicit biol the drugs based on their mechanism of actic create the synthetic routes for medicinal con-	-Remember) of drugs and their metabolic pathways(BL2 ogical response(BL4-Analyze) on and clinical uses(BL4-Junderstand) npounds.(BL6-Create)	-Understand)									
Coures Elements	Skill Development J Entrepreneurship J Employability J Professsonal Ethics Gender X Human Values X Environment X	x	SDG (Goals)	SDG3(Good health and well-being) SDG4(Quality education) SDG4(Quality education) SDG4(Quality education) SDG12(Responsible consuption and production) SDG12(Responsible consuption and production)									

		Part B	
Modules	Contents	Pedagogy	Hours
UNIT-I	Introduction to Medicinal Density History and development of medicinal chemistry Physicochemical properties in relation to biological action instanto, Solubility Partition Coefficient, Hydrogen bioding, Protein binding, Chelation, Biosoatterim, Optical and Geometrical isomerism. Drug metabolism Drug metabolism principles-Phase I and Phase II. Factors affecting drug metabolism including stereo chemical aspect	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board	10
UNIT-II	Drugs acting on Autonomic Nervous System Advenençic Neurothammitters: Biosynthesis and catabolism of catecholamine. Advenençic neoptors (Alpha & Bela) and theri dinatubulon. Sympathommetica agents: Sitos Adventica agents Bioteta alicin: Nor- opinephrine, Epinephrine, Phenrylephrine', Dogamine, Methydopa, Clonidine, Dobutamine, Isoproterenol, Terbutaline, Sabutamot', Biotlarch, Napharoline, Oxynatzarian and Xylomatozione Indirect ading agents: Hydorogamphatamine, Resouchendenia, Proghtexadrine Indirect acting agents: Hydorogamphatamine, Pesudosphetamine, Pesudosphetamine, Pesudosphetamine, Pesudosphetamine, Pesudosphetamine, Pesudosphetamine, Pesudosphetamine, Pesudosphetamine, Peraosphetamine, Pesudosphetamine, Peraosphetamine, Paraosphetamine, Peraosphetamine, Peraosphetamine, Peraosphetamine, Peraosphetamine, Paraosphetamine, Paraosphetamine, Paraosphetamine, Paraosphetamine, Paraosphetamine, Paraosphetamine, Paraosphetamine, Paraosphet	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board	10
UNIT-III	Cholenegie neurotementilers: Biosynthesis and catabolism of acetylcholine. Cholenegie receptors, Muscarine & Nacotinci) and their distribution. Prevensynathorniente legates: SAR of Persenynathornianelia egates Direct acting agents. Acetylcholine, Catabolo'i, Bethanachol. Methacholine, Pilocarpine. Indirect acting/ Cholinestense inhibitors (Revensible & Inrevensible): Physiostigmine. Neostigmine: Pyriostigmine. Exclored acting/ Cholinestense inhibitors (Revensible & Inrevensible): Physiostigmine indirect acting and acting and agents Solanaceous alkaloids and analogues. Atropine subthate, Hoosophine subthate, Solayalamine hydrochonide, Honartopine hydrochomide, Dratopium borotinde', Stynbetic cholinergic blocking agents: Tropicamide, Cyclopentolate hydrochonide, Clanium bromido, Dicyclonine hydrochonide', Gycopynitale, Mahantelline bromine, Proprathielline bromide, Bertarbine Reylade, Orghenadrine drate, Berdine hydrochonide, Procycidine hydrochonide', Tridhexethyl choride, Issorpamile iodide, Ehopropazie hydrochonide.	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board	10
UNIT-IV	Drugs acting on Central Nervous System A. Sodarlives and Hyporoloss. Benzodiazapines CAM of Benzodiazapines, Chiordazapovide, Diazegoam, Oscargoam, Chiorazapie, Lorazegoam, Aprojose Manthuraes, SAR of Ashurburas, Bartolat, Henrobarthal, Mephobarbital, Amodarbital, Bentobarbital, Secobarbital Miscelleneous: Amides & Innides, Chiordazapovide, Diazegoam, Oscargoam, Chiorazapie, Elchichorynol, Abdylog & Brair derivatives: Tickolos actinum, Paradatelyde & Antegovidents antemate derivatives: Mepotobarbital, Elchichorynol, Abdylog & Brair derivatives: Tickolos actinum, Paradatelyde & Antegovidents Phonolizaciens: Chiordbarbital, Pentobarbital, Secobarbital, & Tickolos actinum, Paradatelyde & Antegovidents Phonolizaciens: Chiordbarbitane, Ticholisone, Lozagine succinate, Cazganes, Furo Sutorforomes, Hasperidol, Diroperidol, Resperidone. Beta anino ketenes: Maindone hydrochloride. Benzamides: Subjertice. C. Anticonvulantis. SAR of Anticonvulants, Probatismi of disconvulant at José Diadutates. Phonolizaciense: Havo Sutorforomes: Hasperidol, Diroperidol, Resperidos-Unidades, Carbanutascie, Proceadingene, Havo Burdolingeneous, Primotikarette, Parofutationes, Hasperidol, Diroperidol, Resperidos-Unidades, Carbanutascie, Primotochlore, Benzamides, Viginicitae. C. Anticonvulantis. SAR of Anticonvulantis, monoacylureas: Phenacemide, Carbanazepiner' Benzodiazepines: Clonazepam Miscellaneous. Primidone, Valproic acid, Gebepertin, Feibamate	Lecture based learning, interactive class, Peer futorial, Class using ICT tool/PPT/white board	10
UNIT-V	Drugs acting on Central Nervous System General anesthetics: Inhalation anesthetics: Halothane*, Methoxyflurane, Enflurane, Sevolturane, Isoflurane, Desflurane, Utra short acting barbitutrates: Methohexital sodium*, Thiamyfal sodium, Thiopental sodium. Dissociative amethotics: Keatime hydrochoxids:	Lecture based learning, interactive class, Peer tutorial, Class using ICT too//PPT/white board	7
		Part C	

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Receptor binding of drug simulation	Simulation	BL2-Understand	10

	Part D(Marks Distribution)												
Theory													
Total Marks         Minimum Passing Marks         External Evaluation         Min. External Evaluation         Internal Evaluation         Min. Internal Evaluation													
100	50	75 38		25	13								
			Practical										
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation								

	Part E
Books	
Articles	NA
References Books	1. Introduction to principles of drug design- Smith and Williams. 2. Remington's Pharmaceutical Sciences. 3. Martindale's extra pharmacopoeia 4. Indian Pharmacopoeia
MOOC Courses	https://ptel.ac.in/
Videos	You tube

	Course Articulation Matrix														
COs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	-	1	•	-	-	2	-	3	-	2	-	3
CO2	2	2	2	-	2	•	-	-	1	-	2	-	2	-	2
CO3	3	1	1	-	1	-	-	-	1	-	2	-	3	-	3
CO4	3	-	-	-	1	-	-	-	1	-	2	-	2	-	2
CO5	3	-	-	-	2	-	-	-	-	-	3	-	1	-	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



					BPh	arm							
	Title of the C	ourse	Physical Pharmaceutics II										
	Course Co	ode	BP403T										
					Par	rt A							
									L	т	Р	С	
	Year		2nd	Semester	4th		Credits		3	1	0	4	
	Course Ty	rpe	Theory only				I						
	Course Cate	gory	Discipline Core										
	Pre-Requis	ite/s			Co-Requisite/s								
	Course Outc & Bloom's L	omes .evel	CO1- To introduce and categoriz CO2- To make the use of princip CO3- To interpret the rheologica CO4- To determine the propertie CO5- To formulate and evaluate	te the dispersed systems and understand the properties les of kinetics in the stabilization of dosage forms, ( <b>BL3</b> . I behavior of fluids and illustrate the physics of tablet co is of powders and apply them in formulation developme coarse dispersions making use of rheological and elect	and applicatio -Apply) mpression.(BL nt.(BL4-Analy; trical properties	ons of colloidal dispersions.(BL2-Understand) _2-Understand) ze) s.(BL5-Evaluate)							
	Coures Elem	ients	Skill Development ✓ Entrepreneurship × Employability × Professsonal Ethics × Gender × Human Values × Environment ×			SDG (Goals)	SDG4(Quality education)						
					Par	rt B							
Modules			Contents				Pedagogy					Hours	
UNIT-I	Colloidal dispers classification of c coacervation, pe	ions: Classification of disperse colloids & comparative accour ptization& protective action	ed systems & their general charact at of their general properties. Optica	teristics, size & shapes of colloidal particles, al, kinetic & electrical properties. Effect of electrolytes,	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board							7	
UNIT-II	Rheology: Newtonian systems, law of flow, kinematic viscosity, effect of temperature, non-Newtonian systems, pseudoplastic, dilata plastic, thisotropy, thixotropy in formulation, determination of viscosity, capillary, falling Sphere, rotational viscometers Deformation solids: "Ratis" and elastic deformation, Rekole equation, Stress, Strain, Elastic Modulus					ed learning, interactive class, Peer tutorial, Cla	ss using ICT tool/PPT/white board					10	
UNIT-III	Coarse dispersion deflocculated surpreservation of e	on: Suspension, interfacial pro spensions. Emulsions and the emulsions, rheological properti	perties of suspended particles, set ories of emulsification, microemuls ies of emulsions and emulsion form	tling in suspensions, formulation of flocculated and sion and multiple emulsions; Stability of emulsions, nulation by HLB method.	Lecture base	ed learning, interactive class, Peer tutorial, Cla	ss using ICT tool/PPT/white board					10	
UNIT-IV	Micromeretics: F determining part determining surf & flow properties	Particle size and distribution, m icle size by different methods, ace area, permeability, adsorp a.	nean particle size, number and wei counting and separation method, stion, derived properties of powden	ght distribution, particle number, methods for particle shape, specific surface, methods for s, porosity, packing arrangement, densities, bulkiness	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board							10	
UNIT-V	Drug stability: Re Physical and che dielectric consta common reaction Photolytic degrae	eaction kinetics: zero, pseudo- emical factors influencing the o nt, specific & general acid bas ns like hydrolysis & oxidation. dation and its prevention	-zero, first & second order, units of chemical degradation of pharmace re catalysis, Simple numerical prob Accelerated stability testing in exp	basic rate constants, determination of reaction order. utical product: temperature, solvent, ionic strength, kems. Stabilization of medicinal agents against iration dating of pharmaceutical dosage forms.	Lecture based learning, interactive class, Peer tutorial, Class using ICT tooIPPT/white board							10	
					Par	+ C							
					Fai	Indicative-A	BCA/PBL/						
Modul	les			Title		Experiments	/Field work/ ships		Bloom's Level			Hours	
UNIT-III	P	REPARATION OF EMULSION	NS, SUSPENSIONS			Experiments		BL3-Apply			10		
				P	Part D(Marks	s Distribution)							
					The	ory							
Total Ma	arks	Minimum Pa	assing Marks	External Evaluation		Min. External Evaluation	Internal Evaluatio	n		Min. Interna	Evaluation		
100	50	)		75	38	a.a.							
Tot-1 Ma	arke	Ninimum D	assing Marke	External Evaluation	Prac	Min External Evaluation	Internal Functional			Min Into	Evaluation		
rotal Ma	0	winimum Pi	acomy widths			min. External Evaluation	internai Evaluatio	•		mm. mema	Lvaluation		
L							<u> </u>		<u> </u>				
	Books					IL E							
	Articles 1.Liberman H.A., Lachman C., Pharmaceutical Dosage forms, Tablets, Volume-1 to 3, Manavalan R.				arcel Dekkar In	nc. 2. Liberman H.A, Lachman C, Pharmaceuti	cal dosage forms. Disperse systems, volun	ne 1, 2, 3. Marcel	Dekkar Inc. 3. Phy	sical Pharmac	eutics by Rama	isamy C, and	
	References Books												
1	MOOC Cour	rses											

	Course Articulation Matrix														
COs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	P011	PO12	PSO1	PSO2	PSO3
CO1	1	1	1	-	1		-	-	2	-	3	-	1	2	1
CO2	2	2	2	-	-	-	-	-	1	-	2	-	2	2	2
CO3	3	3	3	-	2		-	-	1	-	2	-	3	1	3
CO4	3	1	1	1	1		-	-	1	-	2	-	2	1	2
CO5	2	1	2	1	1	-	-	-	1	-	3	-	2	2	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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https://nptel.ac.in/



	Title of the Course	Pharmacology I	harmacology I										
	Course Code	BP404T	MOAT										
	PartA												
	¥	2-4	Summer to a	411-	Cardina	L	Т	Ρ	5				
	Tear	210	Semester	401	Credits	3	1	0	4				
	Course Type	Theory only	Theory only										
	Course Category	Discipline Core											
	Pre-Requisite/s				Co-Requisite/s								
	Course Outcomes & Bloom's Level	CO1- To define the fundamental concepts of pharmacology and pharmacokinetics(BL1-Remember) CO2 To understand the basics of pharmacodynamics, adverse reactions, drug interactions and drug discovery(BL2-Understand) CO3 To identify the role of neurohumonal transmission and drugs acting on peripheral nervous system.(BL4-Analyze) CO4- To analyze the functions of neurotransmitters and drugs acting on central nervous system.(BL4-Analyze) CO5- To evaluate the pharmacology of Psychopharmacological agents.(BL4-StraVaute) CO5- To evaluate the pharmacology of Psychopharmacological agents.(BL4-StraVaute)											
Skil Development ✓ Entreprensurship X Employabilit X Professional Ethics X Gender X Human Nalues X Environment X				SDG (Goals)	SDG3(Good health and well-being) SDG4(Quality education)								
				Part B					-				
Modules		Contents			Pedagogy				Hours				

UNIT-I	<ol> <li>General Pharmacology a. Introduction to Pharmacology- Definition, historical landmarks and scope of pharmacology, nature and source of drugs, essential drugs concept and routes of drug administration. Agonists, antagonists (competitive and non-competitive), spare receptors, addiction, bierance, dependeron, schrophylikasi, idosprinces, allergy D. Pharmacoknetice-Membrane transport,</li> </ol>	Lacture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board	8								
UNIT-II	acception, sustanciality, metaleosism and exceteen or drugs, Enzyme induction, etcryme innibianor, kneece or elimination Ceneral Pharmacology a Pharmacolymanics-Principle and mechanisms of drug action. Receptor theroise and classification of receptors, regulation of receptors, drug receptors interactions signal transduction mechanisms, 6-protein-coupled receptors, ion channel receptor, transmembrane enzyme link/de receptors, transmembrane AXE-STAT binding receptor and receptors that regulate transcription factors, does response relationship, therapeutic index, combined affects of drugs and factors modifying drug action. De- ending-Drug discovery phase, preclination evidence in clinical transductions phases of druing transing drug actions. De- introduction to Pharmacovigiance. History and development of Pharmacovigiance, and Reporting of Medicine, Pharmacovigiance Porgram of India (PP). Adverse drug reactions: detection and Reporting	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board	12								
UNIT-III	2.Pharmacology of drugs acting on peripheral nervous system a. Organization and function of ANS. b. Neurohumoral transmission, co- transmission and lassification of neurotransmitters. C- transmippathomic peripheral), e. Local anesthetic agents. If. Drugs used in mysterheal gravis and glaucome and the system and seletal muscle relaxants (peripheral), e. Local anesthetic agents. If. Drugs used in mysterheal gravis and glaucome.	Lecture based learning, interactive class, Peer tutorial, Class using ICT tooIPPT/white board	10								
UNIT-IV	3. Pharmacology of drugs acting on central nervous system a. Neurohumoral transmission in the C.N.S. special emphasis on importance of various neurotransmitters like with GABA, Glutamate, Glycine, serotorini, dopamine. b. General aneshetics: a C-stadives, hyporotics and centrally ancienting muscle relaxants. d. Anti-epidepides e. Alcohois and disulfiram nearbetics: C-stadives, hyporotics and centrally acting muscle relaxants. d. Anti-epidepides e. Alcohois and disulfiram	Lecture based learning, interactive class, Peer tutorial, Class using ICT tooIPPT/white board/PPT	8								
UNIT-V	3 Pharmacology of drugs acting on central nervous system a. Psychopharmacological agents: Antipsychotics, antidepressants, anti- arxiety agents, and-manics and hallucinogens. b. Drugs used in Parkineors disease and Atzheimer's disease. c. CNS stimulants and nootropics. d. Djoid analgesiss and antagonists c. Drug addiction, drug abuse, tolerance and dependence.	Lecture based learning, interactive class, Peer tutorial, Class using ICT tooI/PPT/white board	7								
	Part C										

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	EVALUATION OF ANTIDEPRESSANT ACTIVITY	Simulation	BL5-Evaluate	2

Part D(Marks Distribution)
Theory

	neoy											
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation							
100	50	75	38	25	13							
	Practical											
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation							

	Part E
Books	1.K.D. Tripathi. Essentials of Medical Pharmacology, JAYPEE Brothers Medical Publishers (P) Ltd, New Delhi. 2. Sharma H. L., Sharma K. K., Principles of Pharmacology, Paras medical publisher 3. Kulkami SK. Handbook of experimental pharmacology. Vallabh Prakashan,
Articles	JOURNAL related to pharmacology
References Books	1. Rang H. P., Dale M. M., Ritter J. M., Flower R. J., Rang and Dale's Pharmacology. Churchal Livingstone Elsevier 2: Katzung B. G., Masters S. B., Trevor A. J., Basic and clinical pharmacology, Tatla Mc Graw-Hill 3. Goodman and Gilman's, The Pharmacological Basis of Therespositos
MOOC Courses	https://www.mooc-list.com/tags/pharmacology
Videos	you tube

COs	PO1	PO2	PO3	PO4	P05	P06	P07	P08	P09	PO10	P011	P012	PSO1	PSO2	PSO3
CO1	1	3	3	-	1	3	-		2		2	-	1	1	1
CO2	2	2	2	-	-	2	-	-	1	-	3	-	1	1	2
CO3	3	3	3	-	2	3	-	-	2	-	2	-	-	1	1
CO4	2	3	2	-	3	1	-	-	1	-	2	-	1	1	1
CO5	1	2	1	-	2	1	-	-	1	-	2	-	1	1	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-


						Di lia							
	Title of the	Course	Pharmacognosy and Phy	tochemistry I									
	Course	Code	BP405T										
						Part	A						
	Yea	r	2nd	Semester	4th				Credits	L 3	T 1	P 0	C 4
	Course	Туре	Theory only							1			
	Course C	ategory	Discipline Core										
	Pre-Requ	uisite/s	Basic understanding of p	lant taxonomy and physiology				Co-	Requisite/s				
	Course Ou & Bloom	utcomes s Level	CO1- To recall the histor CO2- To remember differ CO3- To illustrate studen CO4- To plan systematic CO5- To analyze quality	r, scope and development of pharmacognosy(BL1 ent sources of crude drugs and also classify them ts about cultivation, collection, processing and stor pharmacognostic study of primary metabolites, ay of crude drugs.(BL4-Analyze)	I-Remember) a accordingly.(BL1- rage of crude drug yurvedic drugs, ma	-Remembe gs.(BL2-Ur arine drugs	er) nderstand) and teratogens.(BL6	-Create)					
	Coures El	ements	Skill Development ✓ Entrepreneurship X Employability X Professsonal Ethics X Gender X Human Values X Environment ✓			SDG (Go	als)	SDG3(Good health and well- SDG4(Quality education) SDG12(Responsible consupt	being) on and production)				
						Part	B						
Modules			Contents			1 an			Pedagogy				Hours
UNIT-I	Introduction to Animals, Marin mucilages, ok pharmacologi natural origin. microscopy of scale with car	Pharmacognosy: (a) Definition, ne & Tissue culture (c) Organizec coresins and oleo-gum -resins). cal, chemo and sero taxonomical Evaluation by organoleptic, micri forude drugs including lycopodium nera lucida	history, scope and develop d drugs, unorganized drugs Classification of drugs: Alp classification of drugs Qu oscopic, physical, chemica m spore method, leaf cons	xment of Pharmacognosy (b) Sources of Drugs – F (dried latex, dried jucies, dried extracts, gums an habelical, morphological, taxonomical, chemical, alily control of Drugs of Natural Origin, Adulteration and biological methods and properties, Quantitat fants, camera lucida and diagrams of microscopic	Plants, nd n of drugs of Leo tive : objects to	gs of Lecture based learning, interactive class, Peer tutorial, Class using ICT tooIPPT/white board 1 to						10	
UNIT-II	Cultivation, C influencing cu to medicinal p	ollection, Processing and storage Itivation of medicinal plants. Plan Ilants	of drugs of natural origin: t hormones and their appli	Cultivation and Collection of drugs of natural origin cations. Polyploidy, mutation and hybridization with	n Factors h reference Leo	cture based	d learning, interactive	class, Peer tutorial, Class usin	g ICT tool/PPT/white board				10
UNIT-III	Historical dev plant tissue cr	elopment of plant tissue culture, t ulture in pharmacognosy. Edible v	ypes of cultures, Nutritiona raccines	al requirements, growth and their maintenance. Ap	pplications of Leo	Ins of Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board							7
UNIT-IV	Pharmacogno Ayurveda, Un classification,	sy in various systems of medicin ani, Siddha, Homeopathy and Ch properties and test for identificati	e: Role of Pharmacognosy inese systems of medicine on of Alkaloids, Glycoside	in allopathy and traditional systems of medicine n a. Introduction to secondary metabolites: Definition s, Flavonoids, Tannins, Volatile oil and Resins	namely, n, Leo	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board							10
UNIT-V	Study of biolo Cotton, Jute, respect to che Pharmaceutic and Enzymes (Waxes, fats,	gical source, chemical nature and Hemp Hallucinogens, Teratogens mistry, sources, preparation, eva al Aids and/or Medicines for the f : Gelatin, casein, proteolytic enzy fixed oils): Castor oil, Chaulmoog	d uses of drugs of natural of , Natural allergens Primary luation, preservation, stora ollowing Primary metabolit mes (Papain, bromelain, s rra oil, Wool Fat, Bees Wa:	origin containing following drugs Plant Products: Fi metabolites: General introduction, detailed study ge, therapeutic used and commercial utility as es: Carbohydrates: Acacia, Agar, Tragacanth, Hon erratiopeptdase, urokinase, sterptokinase, pepsin « Marine Drugs: Novel medicinal agents from mari	ibers - with ney Proteins 1). Lipids ine sources	cture based	d learning, interactive	class, Peer tutorial, Class usin	g ICT tool/PPT/white board				8
						Part	C						
Module	les			Title				Indicative-ABCA/P Experiments/Field v Internships	BL/ vork/		Bloom's Level		Hours
1		VISIT OF MEDICINAL GARDEI	N				Field work	· · ·		BL4-Analyze		10	)
		•			Part I	D(Marks Theo	Distribution)						
Total Ma	arks	Minimum Pa	ssing Marks	External Evaluation			Min. External E	valuation	Internal Evaluation		Mir	n. Internal Evalua	ition
100		50		75	38				25		13		
						Pract	ical						
Total Ma	arks	Minimum Pa	ssing Marks	External Evaluation			Min. External E	valuation	Internal Evaluation		Mir	n. Internal Evalua	ition
1													
	Boo	ks	1.W.C. Evans, Trease an	d Evans Pharmacognosy, 16th edition, W.B. Soun	nders & Co., Londo	Part on, 2009. 2	: E . Tyler, V.E., Brady, L.I	R. and Robbers, J.E., Pharmac	ognosy, 9th Edn., Lea and Febiger, I	Philadelphia, 1988	3. 3. Text Book of Phan	macognosy by T.E	. Wallis 4. Mohammad

Books	Ali. Pharmacognosy and Phytochemistry, CBS Publishers& Distribution, New Delhi. 5. Text book of Pharmacognosy by C.K. Kokate, Purohit, Gokhlae (2007), 37th Edition, Nirali Prakashan, New Delhi
Articles	https://phcogl.com/
References Books	1. Herbal drug industry by RAD. Choudhary (1996), let Edn, Eastern Publisher, New Delhi. 2. Essentials of Pharmacognosy, Dr.SH. Ansari, lind edition, Birla publications, New Delhi, 2007 3. Practical Pharmacognosy C.K. Kokete, Purohit, Gokhiae 4. Anatomy of Crude Drugs by MA. Syenger
MOOC Courses	https://nptel.ac.in/
Videos	YOUTUBE

							Co	ourse Articulation	Matrix						
COs	PO1	PO2	PO3	PO4	PO5	PO6	P07	P08	PO9	PO10	P011	P012	PSO1	PSO2	PSO3
CO1	3	3	3	-	1	2	-	-	2	-	2	-	1	-	2
CO2	3	2	1	-	1	1	-	-	2	-	1	-	2	-	1
CO3	2	1	2	-	1	2	-	-	2	-	2	-	2	-	1
CO4	2	-	-	-	-	-	-	-	2	-	2	-	1	-	2
CO5	3	-	-	-	-	-	-	-	1	-	1	-	1	-	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



				BPharn	1					
Title of the	Course	Medicinal Chemistry I								
Course	Code	BP406P								
				Part A						
Yee	,	2nd	Semester	4th		Credits	L T	Р	с	
ica		2110	Sellester	401		Ciedits	0 0	4	4	
Course	Туре	Lab only								
Course Ca	ategory	Discipline Core								
Pre-Requ	isite/s		Co-Requisite/s							
Course Ou & Bloom's	C01- To recall the basic requirements for synthesis and assay of drugs(BL1-Remember) C02- To explain the techniques involved in solation and purification of drugs and intermediates(BL2-Understand) C03- To synthesize, characterizer and purity medication and purification of drugs and intermediates(BL2-Create) C04- To analyze the selected drugs present in dosage forms and to determine the percentage purity(BL4-Analyze) C05- To determine the physicochemical property of drugs and draw is importance(BL4-Analyze)									
Coures El	Skill Development J Enterprenoumbip X Employability X Professional Ethics X Gender X Human Values X Environability S				SDG1(No poverty) SDG4(Quality educ SDG8(Decent work SDG17(Partnership	ation) and economic growth) s for the goals)				
				Part B						
Mode	ules		Cont	ents		Pedagogy		н	ours	
				Part C						
Nodulos			Title	ln Ev:	Indicative-ABCA/PBL/					

Modules	Title	Experiments/Field work/ Internships	Bloom's Level	Hours
1	Preparation of drugs/ intermediates 1,3-pyrazole	Experiments	BL3-Apply	4
2	II Assay of drugs 1 Chlorpromazine 2 Phenobarbitone 3 Atropine 4 Ibuprofen 5 Aspirin 6 Furosemide	Experiments	BL3-Apply	4
3	2,3- diphenyl quinoxaline	Experiments	BL6-Create	4
4	Benzocaine and Barbiturate	Experiments	BL6-Create	4
5	Phenytoin	Experiments	BL6-Create	4
6	Phenothiazine	Experiments	BL6-Create	4
7	IIDetermination of Partition coefficient for any two drugs	Experiments	BL4-Analyze	8

## Part D(Marks Distribution)

Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation									
	Practical													
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation									
50	25	35	18	15	8									

	Part E
Books	i. Wilson and Giswold's Organic medicinal and Pharmaceutical Chemistry. II. Foye's Principles of Medicinal Chemistry. III. Burger's Medicinal Chemistry, Vol 1 to IV. iv. Introduction to principles of drug design- Smith and Williams. v. Remington's Pharmaceutical Sciences. vi. Martindale's extra pharmaceutical chemistry. III. Foye's Principles of Medicinal Chemistry. III. Foye's Medicinal Chemistry. III. Burger's Medicinal Chemistry. Vol 1 to IV. iv. Introduction to principles of drug design- Smith and Williams. v. Remington's Pharmaceutical Sciences. vi. Martindale's extra pharmaceutical Sciences.
Articles	https://benthamscience.com/public/journals/medicinal-chemistry
References Books	1 Organic Chemistry by LL. Finar, Vol. II. 2. The Organic Chemistry of Drug Synthesis by Lednicer, Vol. 1-5. 3. Indian Pharmacopoeia. 4. Text book of practical organic chemistry- AI.Vogel.
MOOC Courses	https://swayam.gov.in/nc_details/NPTEL https://onlinecourses.pptel.ac.in/
Videos	https://www.youtube.com/results?search_guery=kd+channel
	Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	P05	P06	P07	P08	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	1	-	1	-	-	-	2	-	2	-	1	1	1
CO2	2	-	2		2		-	-	1	-	2	-	2	1	2
CO3	2	2	3	-	2	-	-	-	1	-	2	-	2	1	2
CO4	3	-	-		2		-	-	2	-	2	-	1	1	2
CO5	2	-	-	-	1	-	-	-	-	-	2	-	1	1	1
006	-	-					-	-	-		-	-	-	-	-



Title of the Course	Physical Pharmaceuti	Pharmaceutics II											
Course Code	BP407P												
			Part A										
Ver	2-4	Commuter.	415-	Constitut	L	т	Ρ	с					
Tear	2110	Semester	401	Credits	0	0	4	4					
Course Type	Lab only	•	·		•								
Course Category	Discipline Core	ne Core											
Pre-Requisite/s	Lab safety manual	Lab safety manual Co-Requisite/s											
Course Outcomes & Bloom's Level	CO1- To choose a go CO2- To interpret the CO3- To make use of CO4- To distinguish t CO5- To determine the	od suspending agent to formulate a stable sus shelf life of a given formulation by accelerated f derived and flow properties of powders to ens he rate constants as per the chemical reaction re viscosity using Ostwald's and Brookfield's vi	pension.(BL5-Evaluate) stability studies.(BL5-Evaluate) ure a stable solid formulation.(BL3-Apply) (BL2-Understand) scometer.(BL4-Analyze)										
Coures Elements	Skill Development √ Entrepreneurship X Employabilly √ Coures Elements Professional Ethics X SD Gender X Human Values X Environment X			SDG4(Quality education) SDG9(Industry Innovation and Infrastructure)									

# Part B

Pedagogy

Hours

Contents

Modules

	Pa	rt C		
Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	<ol> <li>Determination of particle size, particle size distribution using sieving method 2. Determination of particle size, particle size distribution using Microscopic method</li> </ol>	Experiments	BL2-Understand	8
2	<ol> <li>Determination of bulk density, true density and porosity 4. Determine the angle of repose and influence of lubricant on angle of repose</li> </ol>	Experiments	BL3-Apply	8
3	<ol> <li>Determination of viscosity of liquid using Ostwald's viscometer 6. Determination sedimentation volume with effect of different suspending agent</li> </ol>	Experiments	BL4-Analyze	8
4	7. Determination sedimentation volume with effect of different concentration of single suspending agent 8. Determination of viscosity of semisolid by using Brookfield viscometer	Experiments	BL4-Analyze	8
5	9. Determination of reaction rate constant first order. 10. Determination of reaction rate constant second order	Experiments	BL3-Apply	8
6	11. Accelerated stability studies	Experiments	BL3-Apply	8

#### Part D(Marks Distribution) Theory Min. External Evaluation Total Marks Minimum Passing Marks External Evaluation Internal Evaluation Min. Internal Evaluation Practical Min. External Evaluation Minimum Passing Marks External Evaluation Internal Evaluation Min. Internal Evaluation Total Marks 25 35 15 8 18

	Part E
Books	1. Physical Pharmacy by Alfred Martin, Sixth edition 2. Experimental pharmaceutics by Eugene, Parott. 3. Tutorial pharmacy by Cooper and Gunn. 4. Stocklosam J. Pharmaceutical calculations, Lea & Febiger, Philadelphia
Articles	https://benthamscience.com/public/journal/172
References Books	1 Liberman HA, Lachman C., Pharmaceutical Dosage forms, Tablets, Volume-1 to 3, Marcel Dekkar Inc. 2. Liberman HA, Lachman C, Pharmaceutical dosage forms, Disperse systems, volume 1, 2, 3. Marcel Dekkar Inc. 3. Physical Pharmaceutics by Ramasamy C, and Manavalan R.
MOOC Courses	https://swayam.gov.in/nc_details/NPTEL.https://onlinecourses.nptel.ac.in/
Videos	https://www.youtube.com/results?search_guery=kd+channel

	Course Articulation Matrix														
COs	PO1	PO2	PO3	PO4	PO5	PO6	P07	P08	PO9	PO10	P011	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	-	1	-	-	-	2	-	2	-	1	1	1
CO2	2	1	2		2	•	-	-	1	-	2	-	2	2	2
CO3	3	1	-	-	3	-	-	-	1	-	2	-	3	1	3
CO4	2	1	-		2	•	-	-	2	-	3	-	1	1	1
CO5	3	1	-	-	1	-	-	-	1	-	2	-	1	1	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



BPharm

Title of the Course	Pharmacology I										
Course Code	BP408P										
			Part A								
Year	2nd	Semester	4th	Credits	L	T	P	C 4			
Course Type	Lab only										
Course Category	Discipline Core	cipline Core									
Pre-Requisite/s	All laboratory techniques and animal experiments are demonstrated by simulated experiments by softwares and videos Co-Requisite/s										
Course Outcomes & Bloom's Level	CO1- To learn about basic instruments, common laboratory animals used in experimental pharmacology and to organize animal house as per the CPCSEA guidelines (BL2-Junderstand) CO2- To demonstrate the common laboratory techniques like routes of administration, blood withdrawal, anesthetec san deuthanasia used for animal studies (BL3-Apply) CO3- To interpret the effects of various grays on rabit yee and cliarly motility for goesophagus to correlation with humans(BL6-Evaluate) CO4- To analyse the effect of various cliards motility of drugs in tabinicating (EL5-Applay) CO5- To evaluate the stereotype and anticatation activity of drugs in tabinicating (EL5-Applay) CO5- To evaluate the stereotype and anticatation activity of drugs in tabinicating (EL5-Applay)										
Coures Elements	Skill Development ✓ Entrepreneurship × Employability × Professsonal Ethics × Gender × Human Values ×		SDG (Goals)	SDG1(No poverty) SDG3(Soci health and well-being) SDG4(Quality education) SDG4(Quality education) SDG4(Industry Innovation and Infrastructure) SDG4(Industry Innovation and Infrastructure) SDG4(Potentiselys for the goals)							

Part B

Hours

Pedagogy

Contents

	Pai	rt C		
Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	1. Introduction to experimental pharmacology. 2,3,4. Commonly used instruments in experimental pharmacology	Experiments	BL2-Understand	6
2	3. Study of common laboratory animals. 4. Maintenance of laboratory animals as per CPCSEA guidelines	Experiments	BL2-Understand	8
3	<ol> <li>Common laboratory techniques. Blood withdrawal, serum and plasma separation, anesthetics and euthanasia used for animal studies.</li> <li>Study of different routes of drugs administration in mice/rats.</li> </ol>	Experiments	BL4-Analyze	8
4	<ol> <li>Study of effect of hepatic microsomal enzyme inducers on the phenobarbitone sleeping time in mice.</li> <li>Effect of drugs on ciliary motility of frog oesophagus</li> </ol>	Experiments	BL4-Analyze	8
5	9. Effect of drugs on rabbit eye. 10. Effects of skeletal muscle relaxants using rota-rod apparatus	Experiments	BL2-Understand	8
6	11. Effect of drugs on locomotor activity using actophotometer. 12. Anticonvulsant effect of drugs by MES and PTZ method	Experiments	BL2-Understand	8
7	13. Study of stereotype and anti-catatonic activity of drugs on rats/mice	Experiments	BL4-Analyze	8
8	14. Study of anxiolytic activity of drugs using rats/mice. 15. Study of local anesthetics by different methods	Experiments	BL3-Apply	8

	Part D(Marks Distribution)												
	Theory												
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation								
	Practical												
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation								
50	25	35	18	15	8								

	Part E
Books	1. Range HL P, Dale M, M., Ritter J, M., Flower R, J., Rang and Dale's Pharmacology. Churchil Livingstone Elsevier 2. Katzung B. G., Masters S. B., Trevor A. J., Basic and clinical pharmacology. Tata Mc Graw-Hill 3. Goodman and Gilman's, The Pharmacological Basic of Therapeutics 4. Marry Arnes K. K. Liopd Yee Y., Brian K. A., Robbin L.C., Joseph G. B., Wayne A K., Bradley R.W., Applied Therapeutics, The Clinical use of Drugs, The Point Lippincott Williams & Wilkins S. Mycek M.J., Gelnet S.B and Perper M.M. Lippincott's illustrated Reviews: Pharmacology
Articles	https://benthamscience.com/public/subject/123
References Books	1: K.D. Trigeth. Essentials of Modical Pharmacology, JAYPEE Brothers Medical Publishers (P) Ltd, New Dehri, 2: Sharma K.L. Sharma K.K. Principles of Pharmacology, Paras medical publisher 3. Modern Pharmacology with clinical Applications, by Charles R. Craig& Robert, 4: Ghosh MN: Fundmentales of Experimental Pharmacology, Wilab R. Schwarth S.K. Handbook of experimental Pharmacology, Value Pharmacology, V
MOOC Courses	https://swayam.gov.in/nc_details/NPTEL https://onlinecourses.nptel.ac.in/
Videos	https://www.youtube.com/results?search_query=kct+channel

COs	PO1	PO2	PO3	PO4	PO5	P06	P07	P08	PO9	PO10	P011	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	-	1	-	-	1	-	-	2	-	2	1	2
CO2	2	2	2	-	2	-	-	-	-	-	2	-	2	1	2
CO3	3	3	3	-	3	-	-	-	-	-	3	-	3	2	3
CO4	2	•	-	-	•	-	-	-	-	-	2	-	1	1	1
CO5	3	1	-	-	1	-	-	-	-	-	2	-	1	1	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



			Di nam						
Title of the Course	Pharmacognosy and P	hytochemistry I			-	-			
Course Code	de BP400P								
			Part A						
¥	2-4	Summation	441	Condito	L	Т	Р	с	
Tear	210	Semester	401	Creans	0	0	4	4	
Course Type	Lab only		,	•					
Course Category	Course Category Discipline Core								
Pre-Requisite/s				Co-Requisite/s		-			
Course Outcomes & Bloom's Level	CO1- To remember dif CO2- To understand the CO3- To evaluate the of CO4- To evaluate the of CO5- To evaluate the of	ferent morphological and microscopical characte re cellular structure of crude drugs, (BL2-Unders crude drugs by quantitative evaluation methods, ( crude drugs by physical methods of evaluation, (I crude drugs by chemical methods of evaluation, (	eristic features of crude drugs.(BL1-Remembe tand) (BL5-Evaluate) BL5-Evaluate) (BL5-Evaluate)	n)					
Coures Elements	Skill Development ✓ Entrepreneurship X Employability X Professsonal Ethics X Gender X Human Values X Environment X	:	SDG (Goals)	SDG3(Good health and weil-being) SDG4(Quality education) SDG11(Sustainable cities and economies)					

Part B

Pedagogy

Hours

Contents

Modules

	Par	tC		
Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	1. Analysis of crude drugs by chemical tests: (i) Tragaccanth (ii) Acacia (iii) Agar (iv) Gelatin (v) starch (vi) Honey (vii) Castor oil	Experiments	BL2-Understand	4
2	2. Determination of stomatal number and index	Experiments	BL5-Evaluate	4
3	3. Determination of vein islet number, vein islet termination and paliside ratio	Experiments	BL2-Understand	4
4	4. Determination of size of starch grains, calcium oxalate crystals by eye piece micrometer	Experiments	BL4-Analyze	4
5	5. Determination of Fiber length and width	Experiments	BL3-Apply	4
6	6. Determination of number of starch grains by Lycopodium spore method	Experiments	BL3-Apply	4
7	7. Determination of Ash value	Experiments	BL2-Understand	4
8	8. Determination of Extractive values of crude drugs	Experiments	BL4-Analyze	4

# Part D(Marks Distribution)

	inevity (1997)										
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation						
Practical											
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation						
50	25	35	18	15	8						

Books         1. W.C.E.yeara, Trasse and Evana Pharmacognosy, 16th editors, WB. Sounders & Co., London, 2009. 2. Ptyc. V.E., Brady, L.A. and Robbers, J.E., Pharmacognosy, 06t. Edit, Lea and Feldiper, Philadelphia, 1898. 3. Text Book of Pharmacognosy by T.E. Wallis 4.           Motion Mathematics, CBS Publishers & Distribution, New Delhi. 5. Toxt book of Pharmacognosy, 00 r.E. W. Lea and Feldiper, Philadelphia, 1898. 3. Text Book of Pharmacognosy by T.E. Wallis 4.           Articles         https://www.siencedirect.com/journal/phytomedicine https://www.ajol.info/index.php/lopat.https://www.phcogres.com/           References Books         1. Herizal drug industry by R.D. Choudhary (1996), lat Edn, Eastern Publisher, New Delhi. 2. Essentials of Pharmacognosy. Dr.SH.Ansari, Ilind edition, Birla publications, New Delhi, 2007 3. Practical Pharmacognosy. CK. Kokate, Purohit, Gokhiae 4. Anatomy of Crudo Dis by M.A. Jangar		Part E
Articles         https://www.sciencedirect.com/journal/phytomedicine https://www.ajol.info/index.php/jopat.https:/	Books	1. W.C.Evans, Trease and Evans Pharmacognosy, 16th edition, W.B. Sounders & Co., London, 2009. 2. Tyler, V.E., Brady, L.R. and Robbers, J.E., Pharmacognosy, 9th Edn., Lea and Febiger, Philadelphia, 1988. 3. Text Book of Pharmacognosy by T.E. Wallis 4. Mohammad Ali. Pharmacognosy and Phytochemistry, CBS Publishers& Distribution, New Delhi. 5. Text book of Pharmacognosy by C.K. Kokate, Purohit, Gokhlae (2007), 37th Edition, Nirail Prakashan, New Delhi.
References Books 1. Herbal drug industry by R.D. Choudhary (1996), Ist Edn, Eastern Publisher, New Delhi. 2. Essentials of Pharmacognosy, Dr.SH.Ansari, Ilind edition, Birla publications, New Delhi, 2007 3. Practical Pharmacognosy: C.K. Kokate, Purchit, Gokhlae 4. Anatomy of Crude D by M.A. Iyengar	Articles	https://www.sciencedirect.com/journal/phytomedicine https://www.ajoi.info/index.php/jopat https://www.phcogres.com/
	References Books	1. Herbal drug industry by R.D. Choudhary (1996), ist Edn, Eastern Publisher, New Dehi, 2. Essentials of Pharmacognosy, Dr.SH. Ansari, lind edition, Birla publications, New Dehi, 2007 3. Practical Pharmacognosy, C.K. Kokale, Purchit, Gokhiae 4. Anatomy of Crude Drugs by M.A. Jenger
MOOC Courses	MOOC Courses	
Videos https://www.youtube.com/results?search_query=kd+channel	Videos	https://www.youtube.com/results?search_query=kci+channel

	Course Articulation Matrix														
COs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	P011	PO12	PSO1	PSO2	PSO3
CO1	2	1	3	-	1	-	-	-	1	-	3	-	1	-	1
CO2	3	2	2	-	2	-	-	-	2	-	2	-	2	1	2
CO3	2	1	3	-	3	-	-	-	1	-	2	-	3	-	1
CO4	3	1	-	-	-	-	-	-	1	-	2	-	1	1	1
CO5	3	1	-	-	-	-	-	-	1	-	2	-	1	1	2
CO6	-	-		-		-	-	-	-	-		-	-	-	



			BPharm					
Title of the Course	Fine art and Music IV/ on	line certification course *						
Course Code	BP410T							
Part A								
Your	2nd	Somestor	415	Credite	L	т	Ρ	с
1001	210	Sellester	401	Cieurs	0	0	1	1
Course Type	Theory only							
Course Category	Generic Elective							
Pre-Requisite/s	Co-Requisite/s							
Course Outcomes & Bloom's Level	C01- To accquire knowledge about the clinical data mangement and its skills (BL2-Understand) C02- To understand about CRF processing, and documentation forms (BL2-Understand) C03- To develop skills to accquire Job portunities (BL2-Apply)							
Skill Development / Entropremurship X Employability / Course Elements Grader X Grader X Human Voluse X Environment X		SDG (Goals)	SDG3(Good health and well-being) SDG4(Quality education)					
			Port P					

## Part D(Marks Distribution)

Pedagogy

Hours

Contents

Modules

	Theory											
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation							
25		20	10	5	2							
	Practical											
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation							
	0											

# Part E Books 6 Articles 6 References Books 6 MOOC Courses http://www.coursera.org/learn/clinical-data-management Videos 6

	Course Articulation Matrix														
COs	P01	PO2	PO3	PO4	P05	PO6	P07	P08	PO9	PO10	P011	PO12	PSO1	PSO2	PSO3
CO1	1	1	-	1	-	-	-	-	-	-	2	-	1	-	-
CO2	1	1	-	-	-	-	-	-	-	-	2	-	-	-	-
CO3	1	1	-	-	-	-	-	-	-	-	1	-	-	-	1
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



	Title of the Course	Medicinal Chemistr	y II								
	Course Code	BP501T									
					Part A						
							L	т	Р	С	
	Year	3rd	Semester	5th		Credits	3	1	0	4	
	Course Type	Theory only				•				+	
	Course Category	Discipline Core									
	Pre-Requisite/s					Co-Requisite/s					
	C01- To recall the classification of drugs obtained by natural and synthetic route(BL1-Remember) CO2- To explain the biological targets for medicinal compound(BL2-Auderstand) CO3- To apply the knowledge of biochemical processes to understand the mechanism of action and therapeutic uses of drugs(BL3-Apply) CO4- To understand the relationships between structure of compound and its activity(BL2-Junderstand) CO4- To understand the relationships between structure of compound and its activity(BL2-Junderstand) CO4- To understand the relationships between structure of compound and its activity(BL2-Junderstand) CO4- To understand the relationships between structure of compound and its activity(BL2-Junderstand) CO4- To understand the relationships between structure of compound and its activity(BL2-Junderstand) CO4- To understand the relationships between structure of compound and its activity(BL2-Junderstand)										
Skill Development J Entrepreneurship X Employability X Coures Elements Professional Ethots X Gender X Human Values X Environment X				ioals)	als) SDG3(Good health and well-being) SDG4(Quality education) SDG12(Responsible consuption and production)						
					Part B						
Modules		Con	tents		Pedagogy						
1	Arbiteternino apretes Halamine, recorder and their distribution in the international tody HL antegoristic. Diptershydernine in bydrocholide', Dimenshydrinea, Boydernines, accordane, Camerania fernanzia, Danipharaline shydrocholide, Tipelaneme shydrocholide, Chlorcyclizine hydrocholide', Medizine hydrocholide, Buclizine hydrocholide, Chlorpheriamme maleate, Triporkline hydrocholide, Phenidamine tatarate, Porostaliza, Destrocholide, Statistica hydrocholide, Chlorpheriamme maleate, Tiporkline hydrocholide, Jasemizota, Loratadine, Cetitzine, Levocatzaine Cromdyn sodium H2-antagonists: Cimetidine', Famottine, Ramitdin, Castilio Proto- pump inhibitos: Cimetazacia, Lanceprazole, Rabiograzole, Fandorgane Admi-ospidate agents: Aldeliane galents: Medicating and Phonolitistics: Cimetazacia, Lanceprazole, Rabiograzole, Fandorgane Admi-ospidate agents: Aldeliane galents: Medicating and pump inhibitos: Cimetazacia, Lanceprazole, Rabiograzole, Fandorgane Admi-ospidate agents: Aldeliane galents: Medicating hydrocholide, Phoundine, Cytrabishin, Mehotorexale', Azathoprine Antibitotica: Dactionenyun, Dauronaking, Dorosubine, Bieomycine Plant plotutes: Elsopadide, Vinteshin subjective Miscelaneous: Cistigatin, Mitotane.										
And-anginal: Vascollators: Anyl rititiva, Nitroghorstin", Peataanyhritoi tetraniinata, lossoobid enhinäri Deprikarione. Calcium channel biockers: Vergenalin. Begridi tyyöcholindi, Dillizaan Myrkocholindi, Nitroghor, Andolpine, Pickolipine, Nicardipine, Nicrolapine, Diuretiss: Castonic anhydrase inhibitors: Acetazizamide', Methazolamide, Dichlorphenmide, Tituzides: Chorlanizade', Hydrochhordinade, Hydrafumetianade, Cyclohistaciae, Loo darkinst, Transmider, Banataviae, Estharynic acid Potasium sparing Hydrochhordinade, Hydrafumetianade, Cyclohistaciae, Loo darkinst, Transmider, Banataviae, Estharynic acid Potasium sparing Einalgerit, Benzzepti Hydrochhoride, Culmapit Hydrochhorde, Methydropate Hydrochhorde, "Condinet Nydrochhoride, Caumaeth Hydrochhorde, monselphale, Guanaeter, zeatale, Solum nifrogrussale, Diszozóe, Minosofi, Reserpti-Hydrafuziare hydrochhorde.					g Lacture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board						10
3.	Anti-arrhythmic Drugs: Quinidine sulphate, Pr hydrochloride, Tocainide hydrochloride, Mexil	ocainamide hydrochlo etine hydrochloride, Li	ride, Disopyramide phosphate*, Phenytoin so prcainide hydrochloride, Amiodarone, Sotalol.	dium, Lidocaine Anti-hyperlipidemic	Lechire based learning interactive class. Peer Inforial Class using ICT tool/PPT/white hoard					10	

Part C						
5.	Antidiabelic agents Insulin and its preparations Sulforyl urass: Tabutamide', Chierpopamide, Cilipcide, Gilinepide, Bigunides, Mefformin: Thuscilidenciones: Populatione, Resigniduse: Meginides: Respandine, Nateglindie, Guccadiase Inhibers: Acrabose; Vogiliose, Local Anesthetics: SAR of Local anesthetics Benzoir Add derivatives; Cocanie, Hexylcaine, Merylcaine, Cyclomethycaine, Pipercania: Amino Benzoira add derivatives: Benzoira Add derivatives; Cocanie, Hexylcaine, Merylcaine, Cyclomethycaine, Lidocanie/Anilide derivatives: Barzocanie, Benzoira Add derivatives; Cocanie, Hexylcaine, Merylcaine, Diperodin, Dilucuaine & Lidocanie/Anilide derivatives: Barzocanie, Respinsione, Edocanie, Miscellaneous: Pienacaine, Diperodin, Dilucuaine & Messatione: Populational Antigenetic Messationes (Statistica)	Lecture based learning, interactive class, Peer futorial, Class using ICT tool/PPT/white board	07			
4.	Druga acting on Endocrine system Nomenciature. Stereochemistry and metabolism of steroids Sex hormones: Testoaterone, Nandraione, Progetones, Cestriol, Costradiol, Costradion, Costradion, Durgs for erected dynaticnes: Silotandi, Tastiatifi. Oral contraceptives: Milépristone, Norgestril, Levonorgestrol Corticosteriods: Cortisione, Hydrocortisione, Pedinischone, Betamethasone, Dexamethasone Thyrold and artifyroid drugs: L-Thyrocone, L-Thyronien, Prograthicurazi, Meterimazole.	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board	08			
3.	Anli-arrhythmic Drugs: Guindline sulphate, Procainamide hydrochhoride, Disophater, Phenytoin sodium, Lidocaine hydrochhoride, Cloaride hydrochoride, Mexietten Pariorchoride, Loradient Armoldarone, Stolaria, Anti-hyperfluiderine agents: Colfbrate, Loradine hydrochoride, Mexietten Parior Coagulant & Anticoagulants, Menadione, Acetomenadione, Avert Arisancione, Optionel Drugs usatian, Cholester an Congestive Martinality, Diglicom, Nesvithe, Bosentan, Tocsentan, Arisancione, Optionel Drugs usatian, Cholester and Congestive Martinality, Diglicom, Nesvithe, Bosentan, Tocsentan,	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board	10			

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	3D Model making of Histamine Receptor	Games	BL2-Understand	5

	Part D(Marks Distribution)									
	Theory									
Total Marks	Minimum Passing Marks	External Evaluation Min. External Evaluation		Internal Evaluation	Min. Internal Evaluation					
100	50	75	38	25	13					
			Practical							
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation					

Part E						
Books 1. Wilson and Giswold's Organic medicinal and Pharmaceutical Chemistry. 2. Foye's Principles of Medicinal Chemistry. 3. Burger's Medicinal Chemistry. Vol 1 to IV.						
Articles	https://pubs.acs.org/journal/momar					
References Books	1. Burger's Medicinal Chemistry, Vol I to IV. 2. Introduction to principles of drug design- Smith and Williams. 3. Remington's Pharmaceutical Sciences.					
MOOC Courses	https://ptel.ac.in/					
Videos	You tube and others free resource					

	Course Articulation Matrix														
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	P011	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	1	2	•	-	-	-	-	3	-	3	-	3
CO2	2	2	-	1	2	-	-	-	-	-	2	-	2	1	2
CO3	3	3	-	1	2	•	-	-	-	-	2	-	3	-	3
CO4	3	1	-	-	1	-	-	-	-	-	2	-	1	-	2
CO5	2	1	-	•	1	•	-	-	-	-	3	-	1	-	-
CO6	-							-	-	-	-	-			



Title of the Course	Industrial Pharmacy I								
Course Code	BP502T								
			Part A						
Vere			E.L.	Condito	L	т	Ρ	с	
Tear	Sid	Semester	501	Credits	3	1	0	4	
Course Type	Theory only	ny only							
Course Category	Discipline Core	ipline Core							
Pre-Requisite/s				Co-Requisite/s					
Course Outcomes & Bloom's Level	CO1- To outline the obj CO2- To discuss the for CO3- To review the for CO4- To illustrate the p CO5- To describe the p	ectives and applications of pre-formulation studies in the rmulation, manufacturing, coating and quality control te mulation and manufacturing considerations of liquid ora harmaceutical aspects of capsules and pellets. ( <b>BL2</b> -U) reparation and quality control of parenterals and ophthe	e development and stability of dosage forms.(BL3- sts of tablets.(BL2-Understand) ls.(BL4-Analyze) dørstand) almic preparations.(BL4-Analyze)	Apply)					
Skill Development V Entrepreneurship X Emplopaelist Isriva X Gender X Human Values X Environment X			SDG (Goals)	SDG3(Good health and well-being) SDG4(Quality education)					
Part B									
1			1						

Modules	Contents	Pedagogy	Hours				
Unit-1	Preformulation Studies: Introduction to preformulation, goals and objectives, study of physicochemical characteristics of drug substances, a. Physical properties: Physical form (crystal & amorphous), particle size, hape, flow properties, solubility profile (pKa, pH, partition coefficient), polymorphism b. Chemical Properties: Hydrolysis, outdoiton, reduction, acensiadon, polymerization BCS classification of drugs & Is significant Application of preformulation considerations in the development of solid, liquid oral and parenteral closes forms and Is impect on stability of obseque forms.	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board	07				
Unit-2	Tablets: a Introduction, iskal characteristics of tablets, classification of tablets. Excipients, Formulation of tablets, granulation methods, compression and processing problems. Excipients and tablet locating. Tablet coating: Types of coating carating is and inside product testing composition, methods of coating, equipment employed and defects in coating. C. Quality control tests: In process and finished product testing used on the coating and the coating transformation of symps and elixits suspensions and emulsions; Filing and packaging: evaluation of legad coats official in pharmacopeal	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board	10				
Unit-3	Capsules: a. Hard gelatin capsules: Introduction, Production of hard gelatin capsule shells. size of capsules, Filling, finishing and special techniques of formutation of hard gelatin capsules, manifacturing defects. In process and final product quality control tests for capsules. b. Soft gelatin capsules. Nature of shell and capsule content, size of capsules, importance of base adsorption and miningram factors, production, in process and final product quality control tests. Packing, storage and stability testing of soft gelatin capsules and their applications. Pellets: Introduction, formulation requirements, pelletization process, equipments for manufacture of pellets	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board	8				
Unit-4	Parenteral Products: a Definition, types, advantages and imitations. Preformulation factors and essential requirements, vehicles, additives, importance of isolonicity b. Production proceedure, production facilities and controls, aspecip processing c. Formulation of injections, sterile powders, large volume parenterials and typophilized products. d. Containers and closures selection, filling and seals of ampoules, visit and instain fluids. Quality control tests of parentering products. Dipthinaim Proparations, introducto, formulation considerations, formulation of eye drops, eye ointments and eye lotions; methods of preparations into of ophihalmic preparations.	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board	10				
Unit-5	Cosenetics: Formulation and preparation of the following ocennetic preparations: lipsticks, shampoos, cold cream and vanishing cream, tooth pates, bair dyes and survisores. Pharmaceutical archords: preparations: preparations: reparations: queues, page of aerosol systemics that the strateging of the arrow of preparations and manufacture of aerosols. Evaluation of aerosols, Badro and y and preparations: lipsticks, explain and official requirements for constraints of preparations: lipsticks, estimations and manufacture of aerosols. Evaluation of aerosols, badro and y and the strateging of the strategin	Lecture based learning, Interactive class, Peer tutorial, Class using ICT tool/PPT/white board	10				
	Part C						

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
Unit-1	cosmetic preparations from commnely used herbs	Experiments	BL2-Understand	10

Part D	Marks	Distribut

Part D(Marks Distribution)										
Theory										
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation					
100	50	75	38	25	13					
Practical										
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation					

	Part E									
Books	1. Pharmaceutical dosage forms - Tablets, volume 1-3 by H.A. Liberman, Leon Lachman & J.B. Schwartz 2. Pharmaceutical dosage form - Parenteral medication vol- 1&2 by Liberman & Lachman 3. Pharmaceutical dosage form disperse system VOL-1 by Liberman & Lachman 4. Modern Pharmaceutics by Gilbert S. Banker & C.T. Rhodes, 3rd Edition									
Articles	https://www.fip.org/industrial-pharmacy									
References Books	1. Reminington: The Science and Practice of Pharmana, 20th edition Pharmanaeutical Science (RPS) 2. Theory and Practice of Industrial Pharmacy by Liberman & Lachman 3. Pharmaceutica- The science of dosage form design by M.E.Auton, Churchill Livingstone, Latest addition 4. Introduction for Pharmaceutical Dosage Forms by H.C.Ausel, Las E-Arbier, Philadelphia, Shedidon, 2016									
MOOC Courses	https://nptel.ac.in/									
Videos										

ourse	Articulation	1

	Course Articulation Matrix														
COs	a P01 P02 P03 P04 P05 P06 P07 P08 P09 P010 P011 P012 P501 P502 P503														
CO1	3	1	3	3	1		-	-	1	-	3	-	3	1	2
CO2	3	2	2	3	-	-	-	-	1	-	3	-	2	2	2
CO3	3	1	2	3	1		-	-	-	-	3	-	2	2	3
CO4	3	2	3	-	-	-	-	-	1	-	3	-	-	-	-
CO5	2	1	3	1	1	•	-	-	-	-	3	-	1	1	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



								BPharm									
	Title of the	Course	Pharmaco	ology II													
	Course	Code	BP503T														
								Part A									
								T GITTY C					L	т	P	с	-
	Yea		3rd		Ser	nester	5th				Credits	-	3	1	0	4	
	Course	Гуре	Theory or	nly						1					1	1	-
	Course Ca	tegory	Discipline	Core													
	Pre-Requ	site/s									Co-Requisite/s						
	Course Ou & Bloom's	comes Level	CO1- To CO2- To CO3- To CO4- To CO5- To	relate the relative pros Ilustrate the drugs act dentify the role of auti analyze and summariz appraise the physiolog	and cons in the us ng on hematopoie coids and related e the drugs acting ical role of sex hor	se of drugs for various tic system, shock diur drugs.(BL3-Apply) on endocrine system mones and to assess	s cardiac complic retics and anti-diu (BL4-Analyze) the effects of on	ations. (BL2-Unders uretics. (BL2-Unders al contraceptives and	tand) tand) I drugs acting on the	uterus.(BL5-Evaluate)							
	Coures Ele	ments	Skill Deve Entreprer Employat Professo Gender X Human V Environm	alopment ✓ neurship X pility X pnal Ethics X alues X ent X				SDG (Goa	ls)	SDG3(Good health an SDG4(Quality education	d well-being) n)						
								Part B									
Modules				Contents							Pedagog	ау					Hours
1	1. Pharmacolo used in conge	gy of drugs acting on c tive heart failure c. An	ardio vascular syste ii-hypertensive drugs	m a. Introduction to he a. d. Anti-anginal drugs	modynamic and el	lectrophysiology of he c drugs. f. Anti-hyperli	art. b. Drugs pidemic drugs.	Lecture based lear	ning, interactive class	, Peer tutorial, Class usi	ng ICT tool/PPT/white I	board					10
2	1. Pharmacolo anticoagulants a. Diuretics b.	gy of drugs acting on c . c. Fibrinolytics and ar Anti-diuretics.	ardio vascular syste iti-platelet drugs d. F	m a. Drug used in the Iasma volume expand	therapy of shock. t lers 2. Pharmacolo	<ul> <li>Hematinics, coagul gy of drugs acting on</li> </ul>	ants and urinary system	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board 10								10	
3	3. Autocoids a Prostaglandina agents f. Anti-g	nd related drugs a. Intr , Thromboxanes and L , out drugs g. Antirheur	oduction to autacoid eukotrienes. d. Angi natic drugs	s and classification b. otensin, Bradykinin ar	Histamine, 5-HT ar d Substance P. e.	nd their antagonists. o Non-steroidal anti-infl	ammatory	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board								10	
4.	5. Pharmacology of drugs acting on endocrine system a. Basic concepts in endocrine pharmacology. A Anterior Phatiany hormono- analogues and their inhibitors. c. Tryrol hormones- analogues and their inhibitors. d. Hormones englating plasma calcium level- Parathormone, Calcitonin and Vitamin-D. d. Insulin, Oral Hypoglycemic agents and glucagon. e. ACTH and corticosteroids.					y hormones- cium level- ids.	Lecture based lear	ning, interactive class	, Peer tutorial, Class usi	ng ICT tool/PPT/white I	board					8	
5	<ol> <li>Pharmacology of drugs acting on endocrine system a Androgens and Anabolic steroids. b. Estrogens, progesterone and oral contraceptives. c. Drugs acting on the uterus. 6. Bioassay a. Principles and applications of bioassay. b. Types of bioassay c. Bioass of inselin, worknich usernoversin, ACTH Lidukhov uterus dividelis is blatemia end f. HT.</li> </ol>					and oral ay c. Bioassay	Lecture based lear	ning, interactive class	s, Peer tutorial, Class usi	ng ICT tool/PPT/white I	board					7	
1								Part C				r					L
Modul	les				Title					Indicative-ABCA/P Experiments/Field v Internships	BL/ vork/		BI	loom's Level		H	Hours
1		Poster making compte	tion between studen	ts				Gan	les			BL2-Unde	erstand			10	
[							Р	art D(Marks Dist	ibution)								
Tetel M	a dua		imum Dession Mar			Future Future		Theory	Min. Enternal Evalu		Inter	nal Fusivation	-		Min. Internal From		
IOTAI Ma	arks	Mir	iimum Passing Mar	KS	76	External Evaluation		20	Min. External Evalu	ation	inter	nal Evaluation	10		Min. Internal Eva	uation	-
100					13			38 25 13									
Total M:	arks	Mir	imum Passing Mar	ks		External Evaluation		. racada	Min. External Evalu	ation	Inter	nal Evaluation	<u> </u>		Min. Internal Eva	luation	
Total Inc	ano		and a cooling man			External Evaluation			inin: External Evalu							uuton	
	_		1 K D Trir	athi. Essentials of Me	dical Pharmacolor	IV. JAYPEE Brothers	Medical Publishe	rs (P) Ltd. New Delh	. 2. Sharma H I St	arma K. K., Principles of	Pharmacology Parse	medical publisher 3 M	odern Pharm	acology with	clinical Applications	by Charles	R.Craio&
	Book	5	Robert. 4	Ghosh MN. Fundam	entals of Experime	ntal Pharmacology. H	ilton & Company,	, Kolkata. 5. Kulkarni	SK. Handbook of ex	perimental pharmacology	. Vallabh Prakasha					,	
	Articl	95	1.Mycek M	I.J, Gelnet S.B and P	erper M.M. Lippinc	ott's Illustrated Revie	ws- Pharmacolog	y. 2. K.D.Tripathi. Es	sentials of Medical P	harmacology, JAYPEE B	rothers Medical Publis	hers (P) Ltd, New Delhi					
	References	Books	1.Rang H. Therapeu	. P., Dale M. M., Ritter tics	J. M., Flower R. J.	, Rang and Dale's Ph	armacology, Chu	Irchil Livingstone Els	evier 2. Katzung B. G	., Masters S. B., Trevor	A. J., Basic and clinical	pharmacology, Tata Mo	Graw-Hill. 3	3. Goodman a	nd Gilman's, The Ph	armacologic	cal Basis of
	MOOC Co	urses	https://npt	el.ac.in/													
	Video	s	https://ww	w.youtube.com/watch	v=pJ37dBfj670&li?	ist=PLOsge3I7t_CQD	MZu32Y2a3xLT9	963Bn6YM									
								Course Articulation	n Matrix								
COs	PO1	PO2	P03	P04	P05	P06	P07	PO8	PO9	PO10	P011	PO12	PSO1		PSO2	PSO3	
CO1	1	-	-	-	2	3	-	-	-	-	3	1	2		3	2	
CO2	2	-	-	-	1	2	-	-	-	-	3	-	2		3	1	
CO3	2	1	-	-	1	3	-	-	-	-	3	1	2		3	1-	
CO4	2	1	-	-	2	3	-	-	-	-	3	-	2		3	2	
CO5	3			-	1	2	-	-	-	-	2	1	1		1	1	
-				1		1		1	1	1		1	1				



								BPI	arm							
	Title of the	Course	Pharmac	ognosy and Phy	/tochemistry II											
	Course	Code	BP504T													
								Pa	rt A							
								10				L	т	Р		с
	Ye	ar	3rd			Semester	5th	1			Credits	3	1	0	-	4
	Course	Туре	Theory of	only						4			1			
	Course C	ategory	Disciplin	e Core												
	Pre-Req	uisite/s									Co-Requisite/s					
	Course O & Bloom	utcomes 's Level	CO1- To CO2- To CO3- To CO4- To CO5- To	outline the meta the pharmacog demonstrate th plan the industr assess the cruc	abolic pathway in h nistic study of seco e different types an ial production, esti de drug by modern	gher plants and their ndary metabolites like d steps involved in is nation and utilization methods of extraction	biogenetic studies alkaloids, glycosi olation, identificatio of Phytoconstituen , spectroscopy, ch	. (BL1-Remember des, tannins, volati on and analysis of hts. (BL6-Create) romatography, isol	le oils etc, (BL2-Understan Phytoconstituents like terp ation and purification.(BL4	nd) enoids, glycosides, alkaloi -Analyze)	ds and resins.(BL2-Understand)					
	Coures E	lements	Skill Dev Entrepre Employa Professa Gender 3 Human \ Environn	relopment ✓ neurship ✓ ability ✓ sonal Ethics × × /alues × nent ✓				SD	SDG (Goals) SDG3(Good health and well-being) SDG4(Quality education)							
								Pa	rt B							
Modules				Contents							Pedagogy					Hours
1	Metabolic pal secondary m utilization of r	hways in higher plants ar atabolites through these p adioactive isotopes in the	nd their determinat bathways- Shikimic investigation of B	ion a) Brief stud cacid pathway, / iogenetic studie	y of basic metaboli Acetate pathways a s	c pathways and forma nd Amino acid pathw	ation of different ay. b) Study of	Lecture bas	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board							
2	General introduction, composition, chemistry & chemical classes, biosources, therapeutic uses and commercial applications of following secondary metabolites: Akacidas' Vinca, Rauwotfia, Beliadoma, Opium, Phenytporpanoids and Flavonda's Lignans, Tea Ruta Steroids, Cadiac Clycocade & Tritegenoais: Ligunice, Discoscu, Opitalis Voldei es: Menha, Cloce, Crinanon, Fernel, Corander, Tarnins: Cadaciu, Piercoarpus Resins: Benzon, Ouggul, Ginger, Asafordia, Myrn, Colophory Glycoaides: Senna, Al Bitter Almond Indiois, Chet rependio & Anghithaumones: Gentina, Antemisia, taxus, carotenoids						Lecture bas	Lecture based learning, interactive class, Peer tutorial, Class using ICT tooIPPT/white board						14		
3	Isolation, Ider Rutin c) Alkal	ntification and Analysis of oids: Atropine, Quinine, R	Phytoconstituents teserpine, Caffeine	a) Terpenoids: d) Resins: Pod	Menthol, Citral, Art ophyllotoxin, Curcu	emisin b) Glycosides: Imin	Glycyrhetinic acid	& Lecture bas	ed learning, interactive cla	ss, Peer tutorial, Class usi	ng ICT tool/PPT/white board					6
4	Industrial pro Digoxin, Atro	duction, estimation and u pine, Podophyllotoxin, Ca	tilization of the follo ffeine, Taxol, Vincr	owing phytocons istine and Vinble	stituents: Forskolin, astine	Sennoside, Artemisir	nin, Diosgenin,	Lecture bas	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board 10							10
5	electrophores	tochemistry Modern metri is in the isolation, purifica	tion and identifica	tion of crude dru	igs	Spectroscopy, chror	natograpny and	Lecture bas	Lecture based learning, interactive class, Peer tutorial, Class using ICT tooI/PPT/white board 8							
								Pa	rt C			1				
Modul	les				Title				Indicative-ABCA/PBL/ Experiments/Field work/ Internships				Bloom's Level			Hours
1		Extraction method of Gir	ven drugs						PBL			BL2-Understand			8	
								Part D(Mark	Distribution)							
Total Ma	arks	Mini	mum Passing Ma	rks	1	External Eval	uation		Min. External Eval	uation	Internal Evalua	tion		Min. Internal	Evaluation	-
100		50			75			38			25		13			
								Pra	tical							
Total Ma	ntal Marks Ninimum Passing Marks External Evaluation					Min. External Eval	uation	Internal Evalua	tion		Min. Internal	Evaluation				
								_								
	Poo	ke .	1 Text b	ook of Pharmon	onnosy by C.K. Ko	kate Purchit Gokhlar	a (2007) 37th ⊏dia	ion Nirali Prakash	rt E an New Delhi 2 Herbol dr	un industry by R.D. Chour	thany (1996) let Edn. Eastern Put	lisher New Delhi				
	BUU Artic		https://ww	ww.phytoiournal	com/	nuso, r uronin, GOMIIai	5 (2007), 0701 EUlu	ion, miairria6881	an, recar benni. z nelbal di	ag maasay by N.D. Chouc	anary (1000), incluin, castern Put	warren, New Deilli.				
	Reference	s Books	1 W C F	vans Trease or	d Evans Pharmer	anasy 16th edition V	V.B. Sounders & C	o London 2000	2 Mohammad Ali Pharma	conney and Phytochemi	stry CBS Publishers& Distribution	New Delhi				
	MOOCO	0117665	https://pp	tel ac in/	o cyana rinarifiado	gnosy, roureuidoll, i	τ.o. oouniders & C	., condon, 2009.	E. moranniau Air. Phainia	sognoby and rinytoldiellin	say, 555 Fubilitierad Distribution	, read Dollin.				
	Vide	05	https://ww	ww.voutube.com	watch?v=v1vo\/7	HKWa&list=PI tFasP	SB71XtxelidkyrwrF	PiMHidH07G6								
L	Vide		114937/11				/Wir									
-								Course Artic	ulation Matrix	-1	r					
COs	PO1	B02	PO2	BO4	POS	POG	PO7	PO9	POO	PO10	PO11 PO12	PSO1		B802	DSC	12

COs	PO1	PO2	P03	PO4	PO5	P06	P07	P08	PO9	PO10	P011	P012	PSO1	PSO2	PSO3
CO1	3	2	-	-	-	-	1	-	-	-	3	-	2	2	3
CO2	2	2	-		-	-	-	-	-	-	3	-	2	1	2
CO3	3	2	-	-	-	-	-	-	-	-	2	-	1	1	1
CO4	2	1	1		-	-	1	-	-	-	2	-	-	-	1
CO5	2	-	-	-	-	-	-	-	-	-	1	-	1	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



	Title of the Course	Pharmaceutical Jur	isprudence									
	Course Code	BP505T										
		Part A										
	¥	2-1	Summatur.	5 Mb		Cardita	L	т	Ρ	с		
	Tear					Credits	3	1	0	4		
	Course Type	Theory only	•									
	Course Category	Discipline Core										
	Pre-Requisite/s					Co-Requisite/s						
	Course Outcomes & Bloom's Level	CO1- To recall the CO2- To relate the CO3- To apply the CO4- To understan CO5- To appraise t	pharmaceutical legislations, ethics, right to inf significance of Drugs and cosmetics act 1940 knowledge on schedules pertaining to Drugs a d the functions of pharmacy councils and imp the importance of medicinal and toilet preparal	ormation, medical term and its rules 1945 in re and cosmetics act 1940 lementation of educatio tions act and narcotic d	ination of pregnan elation to import ar and its rules 1945 n regulations in pl rugs and psychotr	cy and intellectual property rights(BL1-Remember) dy manufacture of drougs(BL2-Understand) 5 and also administration of the act and rules(BL3-Apply) harmacy(BL2-Understand) opic substances act and rules(BL3-Evaluate)						
	Skill Development ✓ Entrepreneurship × Entrepreneurship × Professional Ethos ✓ Gender ✓ Human Values ✓ Human Values ✓			SDG (G	oals)	SDG3(Good health and well-being) SDG4(Quality education) SDG10(Reduced inequalities) SDG10(Reduced inequalities) SDG12(Responsible consuption and production)						
					Part B							
Modules	dules Contents					Pedag	ogy			Hours		
	Drugs and Cosmotics Act. 1940 and its rules	s and Commetics Act. 1940 and its rules 1946: Objectives, Definitions, Logal definitions of schedules to the Act and Pr										

1	Drugs and Cosmetics Act, 1940 and its rules 1945. Objectives, Definitions, Legal definitions of schedules to the Act and Rules Import of drugs – Classes of drugs and cosmeties prohibited from import, Import under lonese on permit. Manufacture of drugs – Prohibition of manufacture and sale of certain drugs, Conditions for grant of license and conditions of license for manufacture of drugs, Manufacture of drugs for test, examination and analysis, manufacture of new drug, Ioan license and repacking license.	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board	10
2.	Drugs and Cosmetics Act, 1940 and is nules 1945. Datalied study of Scholdule G, H, M, N, P, T, U, Y, X, Y, Part XII B, Sch F & DMR (DA) Sale of Drugs – Wholesale, Retail sale 1945. Datalied study of Scholdule G, H, M, N, P, T, U, Y, X, Y, Part XII B, Sch F & DMR labeling requirements and specimen labels for drugs and cosmetics. List of permitted ordsn: Officiones and penalise. Administration of the Act and Rules – Drugs Technical Advisory Board, Central drugs Laboratory, Drugs Consultative Committee, Government drug analysis, Icensing authorities, controling authorities, Drugs Inspectors	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/while board	10
3.	Pharmacy Ad 1948. Objectives. Definitions, Pharmacy Council of India; its constitution and functions, Education Regulations, State and Joint state pharmacy councils constitution and functions. Registration of Pharmacists, Offensiona and Pentaleta Preparation Ad 1958. Objectives, Definitions, Lourening, Manufacture In bond and Outside bond, Export discoholic preparations, subatances Ad 1958. Objectives, Definitions, Lourening, Manufacture In bond and Outside bond, Export discoholic preparations, subatances Ad 1958. of Bales. Objectives, Definitions, Automities and Others. Constitution and Functions of a nortical & Psychotropic Consultative Committee, National Fund for Controlling the Drug Abuse, Prohibition, Control and Regulation, optum poppy cultivation and production of popy straw, manufacture, sale and export of optum. Offences and Penaleta	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board	10
4	Study of Salient Features of Drugs and Magic Remedies Act and its rules: Objectives, Definitions, Prohibition of certain advertisements, Calasses of Exempted adversisements, Oriences and Penalisies Prevention of Crushy to anamala. Act 1980: Objectives, Definitions, Institutional Airming Ethics Committee, CPCSEA guidelines for Breeding and Stocking of Animals, Performance of Penalise National Paramesoulce) Prioring Autority, Despire Diroro Ottorio Ottore (PDCC): 2012. Objectives, State prior built drugs, Retail price of formulations, Retail price and ceiling price of scheduled formulations, National List of Essential Medicines (MLEM)	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board	8
5	Pharmaceutical Legislations – A brief review, introduction, Study of drugs enquiry committee, Health survey and development committee, Health committee and Mudalian committee Code of Parmaceutical evides eithics Definition, Pharmacis in relation to his job, trade, medical profession and his profession, Pharmacist's cath Medical Termination of Pregnancy Act Right to Information Act Introduction to intellectual Program (Staffs (IPR)).	Lecture based learning, interactive class, Peer tutorial, Class using ICT tool/PPT/white board	7
		Part C	

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	visit of Wholesale, Retail sale and Restricted license.	Field work	BL2-Understand	6

Part D(Marks Distribution)	
Theory	

	Theory State Stat							
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation			
100	50	75	38	25	13			
	Practical							
Total Marks	Minimum Passing Marks	External Evaluation Min. External Evaluation		Internal Evaluation	Min. Internal Evaluation			

Part E						
Books	1. A text book of Forensic Pharmacy by N.K. Jain 2. Drugs and Cosmetics Act/Rules by Govt. of India publications. 3. Medicinal and Toilet preparations act 1955 by Govt. of India publications					
Articles	https://www.jptsalipur.org/wp-content/uploads/2020/08/BP505T-PJ-UNIT_III.pdf					
References Books	1 Medicinal and Toliet preparations act 1955 by (cot. of India publications. 2. Narcotic drugs and psychotropic substances act by Govt. of India publications 3. Drugs and Magic Remedies act by Govt. of India publication 4. Bare Acts of the said laws published by Government. Reference books (Theory					
MOOC Courses	https://nptel.ac.in/					
Videos	You tube					

							Co	urse Articulation	Matrix						
COs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	•	-	-	-	-	3	-	-	-	-	-	2	3
CO2	-	-	•	-	-	-	-	3	-	1	-	-	1	2	2
CO3	-	-	-	-	-	-	-	3	-	-	-	-	1	2	-
CO4	-	-	-	-	-	-	-	3	-	1	-	-	-	-	3
CO5	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Title of the Course	Industrial Pharmacy I	strial Pharmacy I								
Course Code	BP506P	506P								
	PatA									
Yes	2-1	Comparison (	E.L.	Cradita	L	т	Р	с		
Tear	310	Semester	501	Credits	0	0	2	2		
Course Type	Lab only	only in the second s								
Course Category	Discipline Core	aipline Core								
Pre-Requisite/s				Co-Requisite/s						
Course Outcomes & Bloom's Level	C01- To interpret the pre-formulation studies on drugs.(BL2-Understand) C02- To explain the preparation, evaluation and coaling of tables.(BL2-Understand) C03- To design parenteral and ophthalmic pototics.(BL6-Create) C04- To illustrate the formulation and evaluation of capsules.(BL5-Evaluate) C04- To evaluate class containers as per pharmacocella specifications.(BL6-Evaluate) C05-To evaluate class containers as per pharmacocella specifications.(BL6-Evaluate)									
Coures Elements	Skill Development √ Entrepreneurshy √ Employabily √ Professional Efrics X Gender X Human Values X Environment X			SDG3(Good health and well-being) SDC4(Quality education) SDC8(Decent work and economic growth) SDC317(Partnerships for the goals)						

## Part B

Pedagogy

Hours

Contents

	Par	tC		
Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	1. Preformulation studies on paracetamol/aspirin/or any other drug 2. Preparation and evaluation of Paracetamol tablets	Experiments	BL3-Apply	8
2	3. Preparation and evaluation of Aspirin tablets 4. Coating of tablets- film coating of tables/granules	Experiments	BL4-Analyze	8
3	5. Preparation and evaluation of Tetracycline capsules 6. Preparation of Calcium Gluconate injection	Experiments	BL3-Apply	8
4	7. Preparation of Ascorbic Acid injection 8. Quality control test of (as per IP) marketed tablets and capsules	Experiments	BL3-Apply	8
5	9. Preparation of Eye drops/ and Eye ointments 10. Preparation of Creams (cold / vanishing cream)	Experiments	BL3-Apply	8
6	11. Evaluation of Glass containers (as per IP)	Experiments	BL5-Evaluate	8

Part D(Marks Distribution)								
	Theory							
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation			
			Practical					
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation			
50	25	35	18	15	8			

	Part E
Books	3. Pharmaceutical dosage form disperse system VOL-1 by Liberman & Lachman 4. Modern Pharmaceutics by Gilbert S. Banker & C.T. Rhodes, 3rd Edition 5. Remington: The Science and Practice of Pharmacy, 20th edition Pharmaceutical Science (RPS)
Articles	NA
References Books	1. Theory and Practice of Industrial Pharmacy by Liberman & Lachman 2. Pharmaceutics- The science of dosage form design by M.E. Aulton, Churchill Livingstone, Latest edition
MOOC Courses	NA
Videos	NA

							Co	urse Articulation	Matrix						
COs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	3	2	-	-	-	-	-	-	3	-	1	3	3
CO2	2	2	3	1	-	-	-	-	-	-	3	-	1	2	3
CO3	3	1	3	-	-	-	-	-	-	-	3	-	3	-	2
CO4	3	1	1	1	-	-	-	-	-	-	3	-	2	-	2
CO5	3	1	2	1	-	-	-	-	-	-	3	-	1	-	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



BPharm

Title of the Course	Pharmacology II	armacology II								
Course Code	BP507P	507P								
	Part A									
Year	3rd	Semester	5th	Credits	L	т	Р	С		
		ochester	out.			0	2	2		
Course Type	Lab only	anly								
Course Category	Discipline Core	cipline Core								
Pre-Requisite/s	All laboratory techniques and a	Il laboratory techniques and animal experiments are demonstrated by simulated experiments by softwares and videos Co-Requisite/s								
Course Outcomes & Bloom's Level	C01- To learn the importance of physiological salt solutions and to identify the effect of various drugs on isolated frog heart, blood pressure and heart rate of dog (BL1-Remember) C02- To illustrate the duretic activity of drugs in micerize(BL3-Apply) C03- To identify the dose response relationship, effect of drugs on DRC and to construct the drug concentrations by various bioassay methods using animal simulator software (BL4-Analyze) C04- To categorize the PA2 and PD2 value of drugs using rat ancoccyptuse muscle and guinea pig ileum, (BL2-Understand) C05- To interpret the effect of spasmogenes and dogenous practice biological data (BL4-Analyze)									
Coures Elements	Skill Geweiopment / Entrepreneurship / Employability / Professional Elitics X Gender X Human Values X Environment X			SDG3(Good health and weil-being) SDG4(Quality education)						

# Part B

Pedagogy

Hours

Contents

	Part C							
Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours				
1	1. Introduction to in-vitro pharmacology and physiological salt solutions. 2. Effect of drugs on isolated frog heart	Experiments	BL3-Apply	8				
2	3. Effect of drugs on blood pressure and heart rate of dog. 4. Study of diuretic activity of drugs using rats/mice	Experiments	BL5-Evaluate	8				
4	<ol> <li>DRC of acetylcholine using frog rectus abdominis muscle. 6. Effect of physostigmine and atropine on DRC of acetylcholine using frog rectus abdominis muscle and rat ileum respectively.</li> </ol>	Experiments	BL3-Apply	8				
5	7. Bioassay of histamine using guinea pig ileum by matching method. 8. Bioassay of oxytocin using rat uterine horn by interpolation method.	Experiments	BL3-Apply	8				
6	9. Bioassay of serotonin using rat fundus strip by three-point bioassay. 10. Bioassay of acetylcholine using rat ileum/colon by four-point bioassay	Experiments	BL4-Analyze	8				
7	11. Determination of PA2 value of prazosin using rat anococcygeus muscle (by Schilds plot method). 12. Determination of PD2 value using guinea pig ileum	Experiments	BL3-Apply	8				
8	13. Effect of spasmogens and spasmolytics using rabbit jejunum. 14. Anti-inflammatory activity of drugs using carrageenan induced paw-edema model.	Experiments	BL3-Apply	8				

Part D(Marks Distribution)								
	Theory							
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation			
			Practical					
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation			
50	25	35	18	15	8			

Part E						
Books	1. Ghosh MN. Fundamentals of Experimental Pharmacology. Hitton & Company, Kolkata. 2. Kulkarni SK. Handbook of experimental pharmacology. Vallabh Prakashan					
Articles	NA					
References Books	1. Rang H. P., Dale M. M., Ritter J. M., Flower R. J., Rang and Dale's Pharmacology, Churchil Livingstone Elsevier 2. Katzung B. G., Masters S. B., Trevor A. J., Basic and clinical pharmacology, Tata Mc Graw-Hill.					
MOOC Courses	NA					
Videos	NA					

							Co	urse Articulation	Matrix						
COs	PO1	P02	P03	PO4	P05	P06	P07	P08	PO9	PO10	P011	P012	PSO1	PSO2	PSO3
CO1	2	3	-	-	2	3	-		-	-	3	-	1	2	3
CO2	2	1	-	-	1	3	-	-	-	-	3	-	1	2	2
CO3	3	2	-	-	3	3	-	-	-	-	3	-	-	-	2
CO4	2	-	-	-	2	2	-	-	-	-	3	-	-	-	2
CO5	3	-	-	-	2	2	-	-	-	-	2	-	-	-	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Title of the Course	Pharmacognosy and Ph	nytochemistry II								
Course Code	BP508P									
			Part A							
Year 3rd Semester 5th Credits L T										
iea:	510	Semester	501	Ciedita	0	0	2	2		
Course Type	Lab only									
Course Category	Discipline Core									
Pre-Requisite/s				Co-Requisite/s						
Course Outcomes & Bloom's Level	CO1- To remember the CO2- To identify the por CO3- To analyze and er CO4- To isolate the dru CO5- To predict the cru	wide variety of the crude drugs and their sources by m wder mixture and to report the types of adulterants and valuate the powdered crude drug samples by morpholo g from the given crude drug sample. (BLS-Create) de drug by performing chromatographic techniques. (B	orphological characteristics.(BL1-Remember) substituents present.(BL4-Analyze) vgical and microscopical characteristics.(BL4-Analy L5-Evaluate)	ze)						
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics X Gender X Human Values X Environment X		SDG (Goals)	SDG3(Good health and well-being)						

	Pa	rt C		
Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	1. Morphology, histology and powder characteristics & extraction & detection of: Cinchona, Cinnamon, Senna, Clove, Ephedra, Fennel and Coriander	Experiments	BL2-Understand	8
3	3. Separation of sugars by Paper chromatography	Experiments	BL2-Understand	8
4	4. TLC of herbal extract	Experiments	BL3-Apply	8
5	5. Distillation of volatile oils and detection of phytoconstituents by TLC	Experiments	BL5-Evaluate	8
6	6. Analysis of crude drugs by chemical tests: (i) Asafoetida (ii) Benzoin (iii) Colophony (iv) Aloes (v) Myrrh	PBL		8

Part B

Contents

Hours

Pedagogy

			F	Part D(Marks Distribution)							
				Theory							
Total Marks	Total Marks Minimum Passing Marks External Evaluation Min. External Evaluation Internal Evaluation Min. Internal Evaluation										
	Practical										
Total Marks	Minimum Pas	sing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation					
50	25		35	18	15	8					
				Part E							
Boo	ks	1.W.C. Evans, Trease and Evan (2007), 37th Edition, Nirali Praka	ICC. Evans, Trease and Evans Pharmacognosy, 16th edition, W.B. Sounders & Co., London, 2009. 2. Mohammad Ali. Pharmacognosy and Phytochemistry, CBS Publishers& Distribution, New Delhi. 3. Text book of Pharmacognosy by C.K. Kokate, Purohit, Gokhlae (07), 37th Edition, Nirall Prakashan, New Delhi. 4. Herbal drug industry by R.D. Choudhary (1996), Ist Edn, Eastern Publisher, New Delhi.								

Articles	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4204033/#text=Pharmacognosy%20deals%20with%20the%20natural,model%20molecules%20in%20drug%20discovery.
References Books	5. Essentials of Pharmacognosy, Dr.SH.Ansari, Ilnd edition, Birla publications, New Delhi, 2007 6. Herbal Cosmetics by H.Pande, Asia Pacific Business press, Inc, New Delhi. 7. A.N. Kalia, Textbook of Industrial Pharmacognosy, CBS Publishers, New Delhi, 2005.
MOOC Courses	NA
Videos	kcl tutorial

							Co	urse Articulation	Matrix						
COs	PO1	PO2	P03	PO4	P05	PO6	P07	P08	PO9	PO10	P011	P012	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	1	-	-	-	3	-	2	2	1
CO2	2	-	-	-	-	-	1	-	-	-	3	-	1	2	2
CO3	3	-	-	-	-	-	1	-	-	-	3	-	-	-	2
CO4	2	-	-	-	-	-	-	-	-	-	3	-	2	-	1
CO5	2	-	-	-	-	-	1	-	-	-	2	-	-	-	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Title of the Course	Online certified courses rela	ated to Pharmacy I*								
Course Code	BP509ET									
			Part A							
Vor	2rd	Somester	64b	Credite	L	т	Р	С		
100	510	Sellester	501	ciedita	1	0	0	1		
Course Type	Theory only	·								
Course Category	Discipline Specific Elective	1								
Pre-Requisite/s	Co-Requisite's									
Course Outcomes & Bloom's Level	Course Outcomes & Bloom's Level CO1- To remember different morphological and microscopical characteristic features of crude drugs.(BL1-Remember)									
Coures Elements	Skill Development ✓ Entrepreneurship X Employability X Professsonal Ethics X Gender X Human Values X Environment X		SDG (Goals)							
			Part B							
Modules		Contents		Pedagogy			Hours			

Part D(Marks Distribution)
Theory

			Theory		
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation
25	20	20	5	0	0
			Practical		
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation

	Part E
Books	NA
Articles	NA
References Books	NA
MOOC Courses	NA
Videos	NA

	Course Articulation Matrix														
COs	PO1	PO2	PO3	PO4	P05	P06	P07	P08	PO9	PO10	P011	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	-	-	-	-	-	-	-	3	1	-	-	2
CO2	2	2	2	1	-	-	-	-	-	-	2	1	1	1	1
CO3	•	•	-	-	•		-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	•	•	-	-	•		-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



					BPnarm							
Title of th	e Course	International Regulatory Require	ements for Good Manufacturing P	ractices								
Course	Code	BP510ET										
					Part A							
Ya		2rd	Somostor	6th		Credits		L	т	Ρ	С	
10	ai	5	Semester	501			sieuits		1	0	0	1
Course	е Туре	Theory only										
Course C	Category	Discipline Specific Elective										
Pre-Req	uisite/s					Co-F	Requisite/s					
Course O & Bloom	Course Outcomes CO1- To remember different morphological and microscopical characteristic features of crude drugs.(E CO2: To understand the cellular structure of crude drugs.(BL2-Understand)											
Coures E	Elements	Skill Development ✓ Entrepreneurship × Employability ✓ Professsonal Ethics ✓ Gender × Human Values ✓ Environment ×	SDG (Go	oals)	SDG3(Good health and well-being) SDG4(Quality education) SDG12(Responsible consuption and production) SDG16(Resce Justice and strong institutions)							
					Part B							
Moo	dules			Contents		Pedagogy Hours						irs
				P	art D(Marks Dis	tribution)						
					Theory							
Total Marks	Minimum Pa	ssing Marks	External Evalu	uation		Min. External Evaluation		Inte	rnal Evaluation		Min. Internal Eval	uation
50	25		35		18			15		8		
					Practical							
Total Marks	Total Marks Minimum Passing Marks External Evaluation						Min. External Evaluation Inf				Min. Internal Eval	uation
I					Part E							
Boo	oks	https://iris.who.int/bitstream/har	idle/10665/64465/WHO_VSQ_97	.01-eng.pdf?sequence=	=1&isAllowed=y							

Articles	https://www.fda.gov/drugs/pharmaceutical-quality-resources/current-good-manufacturing-practice-cgmp-regulations, CDER-OPQ-Inquiries@ida.hhs.gov
References Books	https://riis.who.intbitstream/handle/10665/64465/WHO_VSQ_97.01-eng.pdf?sequence=1&isAllowed=y
MOOC Courses	https://www.itsigo.ie/courses/higher-certificate-in-science-in-good-manufacturing-practice-gmp/
Videos	https://www.youtube.com/watch?v=mFwA2KTTPwIhttps://www.youtube.com/watch?v=mFwA2KTTPwI

							Co	ourse Articulation	Matrix						
COs	PO1	PO2	P03	PO4	PO5	P06	P07	P08	PO9	PO10	P011	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	1	-	-	-	-	-	3	1	1	1	1
CO2	2	1	1	1	1		-	-	-	-	2	1	1	1	1
CO3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4					-		-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6					-		-	-	-	-	-	-	-	-	-



					harmaceutical Product Development												
	Title of the	Course		Pharmaceutical Produc	t Development												
	Course (	Code		BP511ET													
									Part A	<b>`</b>							
	M					<b>A</b>	-					0		L	т	Р	с
	real			3rd		Semester	5	an i				Credits		3	1	0	4
	Course '	Гуре		Theory only													
	Course Ca	tegory		Discipline Specific Ele	tive												
	Pre-Requi	site/s										Co-Requisite/s					
	Course Ou & Bloom's	comes Level		CO1- To remember dif CO2- To understand th CO3- To evaluate the o CO4- To evaluate the o CO5- To evaluate the o	erent morphologic e cellular structure rude drugs by qua rude drugs by phy rude drugs by che	cal and microscopical charact e of crude drugs. (BL2-Under antitative evaluation methods, vsical methods of evaluation. emical methods of evaluation.	eristic featu stand) .(BL5-Evalu (BL5-Evalu .(BL5-Evalu	res of crude dru uate) ate) uate)	gs. <b>(BL1</b>	-Remember)							
	Coures Ele	ments		Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professonal Ethics × Gender × Human Values × Environment ×					SDG (0	Goals)	SDG3(Good hea SDG4(Quality e	lth and well-being) fucation)					
							•		Part F	3							
	Modu	les				Cont	tents		r art c			P	edagogy			Н	ours
									Part (								
Modul	es				Title					-	Indicative- Experiments Intern	ABCA/PBL/ /Field work/ ships		в	loom's Leve	ı	Hours
1		Evaluation of suspe	ending and e	mulsifying agent					1	Experiments							
				Part D(Marks Distribution)													
								Part D(M	Theor	istribution)							
Total Ma	rks	N	Minimum Pa	ssing Marks		External Evaluation	n			Min. External Evalua	ation	Int	ernal Evaluation			Min. Internal Ev	aluation
100	4	50			75			38				25		13			
									Practic	al		1					
Total Ma	rks	N	Minimum Pa	ssing Marks		External Evaluation	n			Min. External Evalua	ation	Int	ernal Evaluation			Min. Internal Ev	aluation
									Part E								
	Book	s		1. Pharmaceutical Stat	istics Practical and	d Clinical Applications by Star	nford Bolton	, Charles Bon; M	Marcel E	ekker Inc.							
	Article	95		https://www.ema.europ	a.eu/en/document	s/scientific-guideline/note-gui	idance-phan	maceutical-deve	elopmen	t_en.pdf							
	References	Books		3. Pharmaceutical Dos	age Forms – Table	ats Vol 1 to 3, A. Liberman, Le	on Lachma	n andJoseph B.	Schwar	tz							
	MOOC Co	urses		https://www.coursera.o	g/courses?query=	pharmaceutical											
	Video	5		https://www.youtube.co	m/watch?v=sesDt	hMPRC0&list=PLkxD16eG21	1tVre8GBj-L	bjfUUuq1qghVN	И								
				Caura Astaulation Materia													
COs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	vicula	PO9	PO10	P011	PO12	PSO1	1	PSO2	PSO3
CO1	3	1	3	1	1	-	-	-		-	-	3	-	2		1	1
CO2	2	2	1	1	1	-	-	-		-	-	1	-	1		1	1
CO3	3	1	2	1	1	-	-	-		-	-	3	-	2		2	2
CO4	2	1	2	1	1	-	-	-		-	-	1	-	1		1	1
CO5	1	1	2	2	1	-	-	-	_	-	-	3	-	1	-	1	1
CO6	-	-	-	-	-	-	-	-		-	-	-	-	-	-		-



r								
Title of the Course	Purification of Pharmaceution	cal Compounds						
Course Code	BP512ET							
			Part A					
Yes	2-1	Computer.	5H	Con dite	L	т	Р	С
Tear	Siu	Semester	501	Credits	1	0	0	1
Course Type	Theory only	•	•				·	
Course Category	Skill Enhancement Courses	s						
Pre-Requisite/s				Co-Requisite/s				
Course Outcomes & Bloom's Level	CO1- To remember differen CO2- To understand the ce	nt morphological and microscopical characteristic features of cr Ilular structure of crude drugs.(BL2-Understand)	ude drugs.(BL1-Remember)					
Coures Elements	Skill Development ✓ Entrepreneurship X Employability ✓ Professsonal Ethics X Gender X Human Values X Environment X		SDG (Goals)					
			Part B					
Modules		Contents		Pedagogy			Hours	
l								

## Part D(Marks Distribution)

				Theory										
Tot	tal Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation								
50		25	35	18	15	8								
	Practical													
Tot	tal Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation								

	Part E
Books	https://crescent.education/wp-content/uploads/202106/Pharmaceutical-Organic-Chemistry.pdf
Articles	https://www.mdpi.com/books/reprint8083-extraction-and-purification-of-bioactive-compounds
References Books	https://crescent.education/wp-content/uploads/2021/06/Pharmaceutical-Organic-Chemistry.pdf
MOOC Courses	NA
Videos	

							Co	urse Articulation	Matrix						
COs	PO1	PO2	PO3	PO4	PO5	PO6	P07	P08	PO9	PO10	P011	P012	PSO1	PSO2	PSO3
CO1	3	2	1	1	-	-	-	-	-	-	3	-	1	1	1
CO2	2	2	2	1	-	-	-	-	-	-	3	2	-	1	1
CO3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	•	-	-	-	-	-	-	-	-	-	-	-	-



	Title of the	Course	Introductio	on to intellectual pro	perty rights												
	Course	Code	BP513ET														
								Part	4								
													L		т	P	С
	Yea		3rd		Semeste	r	5th				Credit	5	3		1	0	4
	Course	Гуре	Theory or	ıly													
	Course Ca	tegory	Skill Enha	incement Courses													
	Pre-Requ	site/s									Co-Requis	site/s					
	Course Ou & Bloom's	comes Level	CO1- To r CO2- To r CO3- To r CO4- To r CO5- To r	emember different understand the cell avaluate the crude avaluate the crude avaluate the crude	morphological and m ular structure of crude drugs by quantitative drugs by physical me drugs by chemical me	icroscopical charact drugs.(BL2-Under evaluation methods. thods of evaluation.( thods of evaluation.	eristic features of cri stand) (BL5-Evaluate) BL5-Evaluate) (BL5-Evaluate)	ude drugs.(BL'	-Remembe	er)							
	Coures Ele	ments	Skill Deve Entrepren Employab Professo Gender X Human V Environm	Hopment √ eurship √ Mility √ mal Ethics √ alues √ ent X			SE	OG (Goals)		SDG1(No pover SDG3(Good hea SDG4(Quality e SDG6(Clean wa SDG8(Decent w SDG17(Partners	rty) saith and well-being) sducation) ater and sanitation) work and economic g rships for the goals)	rowth)					
r								Part	3								
	Modu	les				Cont	ents					Ped	agogy			Но	ours
								Part	2								1
Modu	les				Title						Indicative-ABCA/ Experiments/Field Internships	PBL/ work/			Bloom's Le	vel	Hours
1		patent drafting and fili	ng						Case Study					BL3-Apply			5
							Pa	rt D(Marks D	istributior	ı)							
					-			Theor	y						1		1
Iotal M	arks	MIR	iimum Passing Mar	KS	76	External Evaluation	1	20	Min. Ex	ternal Evaluation	n	intern	ai Evaluatio	n	40	Min. Internal EV	auation
100		50			/5			Desetia	-1			23			13		
Total M	arks	Mir	imum Passing Mar	ks		External Evaluation		Practic	ai Min Fr	ternal Evaluation	n	Intern	al Evaluation	n		Min Internal Ev	duation
Total M			and a sound man								•						liddion
	Rook	e .	Cockhurn	IM Intellectual pro	nerty rights and phon	maceuticals: challon	nes and onnortuniti	Part I	research '	The economics of	f intellectual property	2009 Jan:150					
	Articl	35	Savale Sk	Savale VK Intelle	ectual property rights	(IPR) World I Pharr	n Pharm Sci 2016	Apr 22:5:2550-	12 12	The coshonics of	r monooual property.	2000 0011 100.					
	References	Books	Prabu SL,	Tnk S, editors. Inte	ellectual property right	s. BoD-Books on D	emand; 2017 Jun 2	1.									
	MOOC Co	urses	NEPTEL														
-	Video	s	NA														
r	1	-1	1	1	-	1	Co	ourse Articula	tion Matri	x						1	- 1
COs	PO1	PO2	P03	PO4	P05	P06	P07	PO8	P09	PC	010	P011	PO12	PSO	1	PSO2	PSO3
CO1	-	2	-	1	-	-	-	3	-	2		3	-	1		1	1
CO2	-	1	-	-	-	-	-	3	-	-		2	-	1		-	1
003	-	1	-	-	-	-	-	2	-	-		-	-	-		-	-
0.04	-	-	-	-	+	-	-	Z	-	-		2	-	-		-	-
005	-	-	-	-	-	-	-	-	-	-		1	-	-		-	-
CUb	-	-	1-	-	-	-	-	1-	-	-		-	-	-		1-	-



								Dria								
	Title of the	Course	Medic	inal Chemistry III												
	Course	Code	BP60	IT												
								Par	A							
					_								L	т	Р	С
	Yea		3rd		s	emester	6th				Credits		3	1	0	4
	Course	Туре	Theor	y only						1						
	Course Ca	tegory	Discip	line Core												
	Pre-Requ	isite/s									Co-Requisite/s					
	Course Ou & Bloom's	tcomes i Level	CO1- CO2- CO3- CO4- CO5-	To remember differe To understand the co To evaluate the crud To evaluate the crud To evaluate the crud	nt morphological and allular structure of cru e drugs by quantitativ e drugs by physical n e drugs by chemical r	microscopical characteris de drugs. (BL2-Understar ve evaluation methods. (BL nethods of evaluation. (BL methods of evaluation. (BL	tic features of nd) 5-Evaluate) 5-Evaluate) 5-Evaluate)	crude drugs.(B	L1-Remember)							
	Coures Ele	ements	Skill [ Entre Emple Profe Gend Huma Envin	Development preneurship X pyability J sssonal Ethics X er X in Values X pomment X				SDG	(Goals)	SDG3(Good health SDG4(Quality edu	and well-being) ation)					
								Par	в							
	Modu	lles				Content	5				Pe	dagogy			Hou	rs
								Par	C							
Modul	95				Title				Indicative-ABC Experiments/Fie Internship	A/PBL/ Id work/ Is		Blo	om's Level		Hours	
1 Pharmacophore modeling and docking Experime												BL2-Ur	derstand			6
							F	Part D(Marks The	Distribution)							
Total Ma	rks	Mini	mum Passing	Marks		External Evaluation			Min. External Evalu	ation	Inte	rnal Evaluation		,	Min. Internal Eval	uation
100		50			75			38			25		13			
								Pract	ical							
Total Ma	rks	Mini	mum Passing	Marks		External Evaluation			Min. External Evalu	ation	Inte	rnal Evaluation		,	Min. Internal Eval	uation
					l			Par	E		I		1			
	Book	s	1. Wil	son and Giswold's O	rganic medicinal and	Pharmaceutical Chemistry	/. 2. Foye's Pr	rinciples of Medi	cinal Chemistry. 3. Burger	's Medicinal Chemist	y, Vol I to IV.					
	Articl	96	https:/	/pubs.acs.org/journa	l/jmcmar											
	References	Books	1. Intr	oduction to principles	of drug design- Smit	h and Williams. 2. Reming	ton's Pharma	ceutical Science	es. 3. Martindale's extra pl	narmacopoeia						
	MOOC Co	urses	https:/	/nptel.ac.in/												
	Video	5	kcl tut	orial												
								Course Articu	lation Matrix							
COs	PO1	PO2	PO3	PO4	PO5	PO6 PI	27	PO8	PO9	PO10	PO11	PO12	PSO1	PS	502	PSO3
CO1	3	2	1	1	2			-	-	-	3	-	1	2		3-
CO2	2	3	-	-	1			-	-	-	2	-	1	2		3
CO3	3	2	-	-	2			-	-	-	2	-	1	2		3
CO4	3	2	-	1	2			-	-	1	3	1	1	1		1
CO5	2	2	-	1	1			-	-	1	1	-	1	1		-
CO6	-	-	-	-	-			-	-	-	-	-	-	-		-



	Title of the	Course	Phar	macology III											
	Course	Code	BP6	02T											
								Part	4						
	Von		ard			Samastar	6th				Cradita		L	T P	с
	100		014			Semester	011				oreans		3	1 0	4
	Course	Туре	The	ory only											
	Course Ca	ategory	Disc	ipline Core											
	Pre-Requ	isite/s									Co-Requisite/s				
	Course Ou & Bloom's	tcomes s Level		<ul> <li>To remember difference</li> <li>To understand the contract of the contract of</li></ul>	nt morphological and allular structure of cru e drugs by quantitati e drugs by physical r e drugs by chemical	I microscopical characteris ude drugs. (BL2-Understa ve evaluation methods. (Bl methods of evaluation. (BL methods of evaluation. (Bl	stic feature nd) L5-Evalua .5-Evaluat L5-Evaluat	is of crude drugs.(BL* te) te)	-Remember)						
	Coures Ele	ements	Skill Entr Emp Prof Gen Hun	Development ✓ epreneurship X loyability X esssonal Ethics X der X uan Values X				SDG (	Goals)	SDG3(Good he SDG4(Quality e	alth and well-being) ducation)				
L			Env	ronment X						1					
[	-							Part	3	1				1	
	Modu	Jles				Conten	ts					Pedagogy			Hours
		1						Part	0						1
Modu	les				Title					Indicative- Experiment Interr	ABCA/PBL/ s/Field work/ nships		Bloom	's Level	Hours
Unit-1		SWISS ADME TOOL	HANDLING						Simulation			E	3L3-Apply		4
								Part D(Marks L	listribution)						
Total Ma	arks	Mi	nimum Passino	Marks		External Evaluation		11100	Min. External Evalu	ation	In	ternal Evaluation		Min. Internal E	valuation
100		50			75			37			25		13		
								Practic	al						
Total Ma	arks	Mi	nimum Passing	Marks		External Evaluation			Min. External Evalu	ation	In	ternal Evaluation		Min. Internal E	valuation
								Part	Ξ						
	Book	(5	Ran	g H. P., Dale M. M., Ri	tter J. M., Flower R.	J., Rang and Dale's Pharm	nacology, (	Churchil Livingstone E	Isevier 2. Katzung B. G.	, Masters S. B., Tr	evor A. J., Basic and clinic	al pharmacology, Tat	ta Mc Graw-Hill		
	Articl	es	https	://www.frontiersin.org/j	journals/pharmacolo	gy/article									
	References	s Books	1. G M.J.	odman and Gilman's, Gelnet S.B and Perce	The Pharmacologica r M.M. Lippincott's III	al Basis of Therapeutics 2 lustrated Reviews- Pharm	. Marry Ani acology 4.	ne K. K., Lloyd Yee Y. K.D.Tripathi. Essentia	, Brian K. A., Robbin L.C als of Medical Pharmaco	., Joseph G. B., W logy, JAYPEE Brot	ayne A. K., Bradley R.W., hers Medical Publishers (F	Applied Therapeutics ) Ltd, New Delhi.	s, The Clinical use of Dri	ugs. The Point Lippincott \	Villiams & Wilkins 3. Mycek
	MOOC Co	ourses	https	://nptel.ac.in/			55 **								
	Video	05	kcl ti	itorial											
1	1	-	1		1			Course Articula	tion Matrix	1					
COs	PO1	PO2	PO3	PO4	P05	P06 P	PO7	PO8	PO9	PO10	P011	PO12	PSO1	PSO2	PSO3
001	3	2	-	-	2	-		-	-	-	3	-	1	2	2
CO2	4	2	-	-	-	-		-	-	-	3	-	1	2	3
CO4	3	1	E	-	-	1		-	-	1	2		-	-	3
004				-	-	-		-	-	-	4		-	-	3
	1.3			-		11 1			-	-	2		2	-	2
CO6	-	-		-	-	-		-	•	-	2	-	2	-	2



								Drinam								
	Title of the	e Course	Herbal Dr	ug Technology												
	Course	Code	BP603T													
								Part A								
								TaitA				L	т		Р	с
	Yei	ar	3rd		Semester		6th			Credits		3	1		0	4
	Course	Туре	Theory o	nly					l							
	Course C	ategory	Discipline	any only an												
	Pre-Req	uisite/s		ary only						Co-Requisite/s						
	Course O & Bloom	utcomes 's Level	CO1- To CO2- To CO3- To CO4- To CO5- To	remember different r understand the cellu evaluate the crude d evaluate the crude d evaluate the crude d	norphological and mi lar structure of crude rugs by quantitative e rugs by physical met rugs by chemical me	croscopical cha drugs.(BL2-Un evaluation meth hods of evaluat thods of evaluat	racteristic features of cr derstand) ods.(BL5-Evaluate) on.(BL5-Evaluate) ion.(BL5-Evaluate)	ude drugs.(BL1-F	Remember)							
	Coures E	lements	Skill Devi Entreprei Employal Professa Gender > Human V Environn	elopment V neurship V bility V onal Ethics X k alues X nent V			SDG (Go	als)	SDG3(Good health a SDG4(Quality educat SDG7(Affordable and SDG8(Decent work a SDG11(Sustainable o SDG12(Responsible	nd well-being) tion) d clean energy) ind economic growth) cities and economies) consuption and producti	ion)					
								Part B								
	Mod	lules				c	ontents	T dit D			Per	dagogy			Hour	s
								Port C		1						
Module	95			Pa Title						Indicative-ABCA Experiments/Field Internships	PBL/ work/			Bloom's L	evel	Hours
1	1	Preparation and standar	rdization of Ayurvedic	yurvedic formulations					arch Paper Presentati	on			BL2-Understa	and		8
							Pa	rt D(Marks Dis	tribution)							
								Theory			1			I		
Total Ma	arks	Mi	nimum Passing Mai	'ks		External Evalua	ation		Min. External Evalua	ation	Inter	nal Evaluation		40	Min. Internal Evalu	ation
100		50			75			38			25			13		
Tatal M	a dua		nimum Dessine Mar			Future Fuel		Practical	Min. Futureal Fuch		Inter	nel Evelvetion			Min. Internal Frank	
Total Ma	aika		minum Passing Ma	N3		External Evalua	laon		Mill. External Evalua	ation	inter				win. Internal Evalu	ation
								Part E								
	Boo	ks	1. Textbo	ok of Pharmacognos	y by Trease &Evans.	. 2. Textbook of	Pharmacognosy byTyle	r, Brady & Robbe	r.							
	Artic	les	https://ww	w.researchgate.net/	publication/8914668_	_Herbal_medici	ne_Current_status_and	_the_future								
	Reference	s Books	3. Pharma	3. Pharmacognosy by Kokate, Purohit and Gokhale 4. Essential of Pharmacognosy by Dr.S.H.Ansari						hemistry by V.D.Rangari	6. Pharmacopoeal star	ndards for Ayurve	dic Formulatio	n (Council of Re	search in Indian Medicir	e & Homeopathy)
	MOOC C	ourses	https://npl	https://nptel.ac.in/												
	Vide	10S	kcl tutoria	I												
COs	PO1	PO2	PO3	PO4	P05	PO6	P07	PO8	PO9	PO10	P011	P012	PSO1		PSO2	PSO3
CO1	3	2	-	-	-	-	2	-	-	-	3	-	1		2	2
CO2	3	2	-	-	-	-	2	-	-	-	3	-	1		2	2
CO3	1	2	-	-	-	-	2	-	-	-	3	-	1		2	2
CO4	2	2	-	-	-	-	1	-	-	-	2	-	2		-	1
CO5	3	2	-	-	-	-	1	-	-	-	2	-	1		-	2
C06	1.	1.		1.		i i	1.	1.	1.	L.	i.	l	-		1.	1.



	Title of the	Course	Biopharr	maceutics and Pha	rmacokinetics										
	Course	Code	BP604T												
							Pa	rt A				L.	т	P	c
	Yea	r	3rd		Semes	ster	6th			Credits		3	1	0	4
	Course	Туре	Theory	only											
	Course Ca	ategory	Disciplin	ne Core											
	Pre-Requ	iisite/s								Co-Requisite	ə/s				
	Course Ou & Bloom's	itcomes s Level	CO1- To CO2- To CO3- To CO4- To CO5- To	o remember differe o understand the c o evaluate the cruc o evaluate the cruc o evaluate the cruc	nt morphological and a allular structure of crue e drugs by quantitative e drugs by physical m e drugs by chemical n	microscopical characte de drugs.(BL2-Unders e evaluation methods. nethods of evaluation.( methods of evaluation.	ristic features of crude drugs.(E tand) (BL5-Evaluate) BL5-Evaluate) (BL5-Evaluate)	L1-Remember	7)						
	Coures El	ements	Skill Der Entrepre Employa Profess Gender Human Environ	velopment ✓ eneurship X ability ✓ sonal Ethics X X Values X ment X			SDG (Goals)		SDG1(No poverty) SDG3(Good health i SDG4(Qualify educe SDG8(Decent work	and well-being) ation) and economic gro	wth)				
							Pa	t B							
	Mod	ules				Cont	ents				Pedagogy			Ho	urs
							Pa	tC							
Modu	les				Title				Indi Expe	icative-ABCA/PBI eriments/Field wo Internships	J rk/		Bloom's Le	evel	Hours
1		in-vitro drug dissolutio	n models,					PBL				BL2-Understand	d		8
							Part D(Marks	Distribution	)						
Total M	arks	Mi	nimum Passing Ma	arks		External Evaluation		Min. Ext	ernal Evaluation		Internal Eva	duation		Min. Internal Eva	luation
100		50			75		38				25		13		
							Prac	tical							
Total M	arks	Mi	nimum Passing Ma	arks		External Evaluation		Min. Ext	ernal Evaluation		Internal Eva	luation		Min. Internal Eva	luation
							Pa	+ =							
	Bool	ks	1. Bioph	narmaceutics and (	Clinical Pharmacokine	tics by, Milo Gibaldi. 2.	Biopharmaceutics and Pharma	cokinetics; By F	Robert F Notari						
	Artic	es	https://o	nlinelibrary.wiley.c	om/journal/1099081x										
	Reference	s Books	3. Applie Delhi 5.	ed biopharmaceution Pharmacokinetics	s and pharmacokineti By Milo Glbaldi Dona	tics, Leon Shargel and ald, R. Mercel Dekker I	Andrew B.C.YU 4th edition, Pre 1c.	ntice-Hall Interr	national edition. USA	4. Bio pharmaceut	ics and Pharmacokinetics-A	Treatise, By D. M. Bra	ahmankar and S	Sunil B.Jaiswal, Vallabh F	Prakashan Pitampura,
	MOOC C	ourses	https://nj	ptel.ac.in/											
	Vide	os	kcl tutori	ial											
C05	PO1	B02	BO2	804	POS	ROE	Course Artic	ulation Matrix	PO40		011 0013	Dec	1	8802	8503
CO1	3	2	2	1	2	-		-09		1	P012	. PSL		2	3
CO2	3	2	2	1	2	-		-	-	3		1		-	3
CO3	2	2	1	-	2	-		-	-	3		1		2	-
1.1.1.1	4				1				1	-				1	
CO4	2	3	1	1	2	-		-	-	3	-	1		1	1
CO4 CO5	2 3	3	1	1	2	-	· ·	-	-	3	- 1	-		1	1
CO4 CO5 CO6	2 3 -	3 1 -	1 2 -	1	2 2 -	-		-	-	3	- 1	-		1 - -	1 2 -



								BPha	arm							
	Title of the	Course	Ph	harmaceutical Biotechno	ogy											
	Course	Code	BF	P605T												
	Part A															
	Vee	_	2	-		Company	<b>C</b> 11-				Condito		L	т	Р	С
	169	r	31	10		Semester	our				Credits		3	1	0	4
	Course	Туре	T	heory only												
	Course Ca	ategory	Di	iscipline Core												
	Pre-Requ	iisite/s									Co-Requisite/s					
	Course Ou & Bloom's	itcomes s Level		01- To remember differe 02- To understand the c 03- To evaluate the cruc 04- To evaluate the cruc 05- To evaluate the cruc	- Internetional United in the provide and the second of											
	Skill Development / Entryremunship X Employabily / Professonal Ehics X Gender X Human Values X Environment X							SDG (Goals) SDG3(Good health and well-being) SDG4(Quality education)								
					Part B											
	Mod	ules			Contents Pedagogy Hours									urs		
	Part C															
Modu	les			Title						Indicative-ABCA/ Experiments/Field Internships	PBL/ work/		Blo	om's Level		Hours
1		DNA ISOLATION FRO	M ONION						Experiments			BL2-	-Understand			4
								Part D(Marks	Distribution)							
Total M	arks	Mir	nimum Passi	ing Marks		External Evaluation			Min. External Evalu	ation	Inter	nal Evaluation		1	Min. Internal Eva	luation
100		50			75			38			25		13			
								Pract	ical							
Total M	arks	Mir	nimum Passi	ing Marks		External Evaluation			Min. External Evalu	ation	Inter	mal Evaluation		1	Min. Internal Eva	luation
								Par	E							
L	Bool	ks	1.	. B.R. Glick and J.J. Past	ernak: Molecular Bi	otechnology: Principles an	d Application	ns of Recombinant	DNA: ASM Press Washin	gton D.C. 2. RA Goldshy	et. al., Kuby Immunolo	gy.				
	Artic	es	htt	tps://pdf.sciencedirectas	sets.com/272281/1-	s2.0-S1369702101X80012	2/1									
	Reference	s Books	3.	J.W. Goding: Monoclona	I Antibodies. 4. J.M	. Walker and E.B. Gingold:	Molecular E	Biology and Biotech	inology by Royal Society	of Chemistry.						
	MOOC C	ourses	htt	tps://nptel.ac.in/												
L	Vide	05	kc	a tutorial												
								Course Articu	lation Matrix							
COs	PO1	PO2	PO3	PO4	PO5	P06 F	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PS	502	PSO3
CO1	3	2	-	-	-			-	-	-	3	-	1	2		2
CO2	2	2	-	1 3 - 1 2						2						
CO3	2	2	-	-	-			-	-	-	2	-	1	2		2
CO4	3	1	-	-	-			-	-	-	3	-	1	1		2
CO5	3	2	-	1	-	1 -		-	-	-	2	-	1	-		2
CO6	-	-	-	-	-			-	-	-	-	-	-	-		-



#### Syllabus-2023-2024 RDH

								BFI	arm							
	Title of the	Course	Quality	Assurance												
	Course	Code	BP606	r												
								Pa	t A							
					_								L	T P	С	
	rea	ur -	ard		58	mester	ьth				Credits		3	1 0	4	
	Course	Туре	Theory	only						<u> </u>						
	Course C	ategory	Discipl	ne Core												
	Pre-Requ	uisite/s								Co-Requisite/s						
	Course Ou & Bloom	utcomes s Level	C01-1 C02-1 C03-1 C04-1 C05-1	o remember differen o understand the cel o evaluate the crude o evaluate the crude o evaluate the crude	morphological and m ular structure of crud- drugs by quantitative drugs by physical me drugs by chemical m	icroscopical characte e drugs.(BL2-Unders evaluation methods.) thods of evaluation.(I ethods of evaluation.)	ristic features c tand) BL5-Evaluate) BL5-Evaluate) BL5-Evaluate)	of crude drugs.(E ) )	L1-Remember)							
Still Development ✓ Entrepreneurstip X Employability ✓ Professsonal Ethics ✓ Gender X Human Values X Environment X								SDG (Goals) SDG3(Good health and we SDG4(Quality education)			nealth and well-being) reducation)	uth and well-being) Jucation)				
					Part R											
	Mod	ules		Contents Pedagogy H								ours				
				Part C												
Modu	es		Title Indicative ABCA/PBL/ Experiments/Field work/ Bloom's Level Internships						's Level	Hours						
1		Calibration of pH meter	ər						Experiments			E	3L2-Understand		4	
									5 ( ) ( )							
								Part D(Marks	Distribution)							
Total Ma	arks	Mi	nimum Passing N	arks		External Evaluation			Min. External Evalu	ation	Inte	rnal Evaluation	1	Min. Internal Eva	aluation	
100		50			75			38			15		13			
								Prac	tical							
Total Ma	arks	Mi	nimum Passing N	arks		External Evaluation			Min. External Evalu	ation	Inte	rnal Evaluation	1	Min. Internal Eva	aluation	
L																
								Pa	tE							
	Boo	ks	1. Qua Publica	lity Assurance Guide itions	by organization of Ph	armaceutical Product	s of India. 2. Go	ood Laboratory F	ractice Regulations, 2nd E	dition, Sandy W	einberg Vol. 69. 3. Quality Ass	urance of Pharm	naceuticals- A compendium	of Guide lines and Related	materials Vol I WHO	
	Artic	les	https://	www.ncbi.nlm.nih.gov	/pmc/articles/PMC30	88954/										
	Reference	s Books	4. A gui Quality	de to Total Quality M specification for Pha	anagement- Kushik M maceutical Substanc	laitra and Sedhan K ( es, Excipients and De	Shosh 5. How to sage forms	o Practice GMP's	- P P Sharma. 6. ISO 900	0 and Total Qua	ility Management – Sadhank G	Ghosh 7. The I	International Pharmacopoe	ia – Vol I, II, III, IV- General	Methods of Analysis and	
	MOOC C	ourses	https://i	nptel.ac.in/												
L	Vide	os	kcl tuto	rial												
								Course Artio	lation Matrix							
COs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	P011	PO12	PSO1	PSO2	PSO3	
CO1	3	1	-	1	2	-	-	-	-	-	3	-	1	2	1	
CO2	1	2	-	1	2	-	-	-	-	-	3	-	1	2	1	
CO3	2	2	-	1	2	-	-	-	-	-	3	-	1	-1	3	
CO4	3	1	-	1	2	-	-	-	-	-	3	-	1	-	2	
CO5	2	1	-	1	1	-	-	-	-	-	2	-	1	-	2	
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	



Title of the Course	Medicinal Chemistry III								
Course Code	BP607P								
			Part A						
Your	3rd	Semester	6th	Cradita	L	т	Ρ	С	
Tear	310	Semester	601	Credits	0	0	2	2	
Course Type	Lab only	nly							
Course Category	Discipline Core	ne Core							
Pre-Requisite/s				Co-Requisite/s					
Course Outcomes & Bloom's Level	CO1- To remember diff CO2- To understand th CO3- To evaluate the o CO4- To evaluate the o CO5- To evaluate the o	O1- To remember different morphological and microscopical characteristic features of crude drugs (BL1-Remember) O2- To understand the calitair structure of crude drugs (BL2-Inderstand) O3- To evaluate the crude drugs ty cumulative evaluation methods (BL5-Evaluate) O4- To evaluate the crude drugs ty cumulative evaluation methods (BL5-Evaluate) O4- To evaluate the crude drugs ty cumulation (BL5-Evaluate) O5- To evaluate the crude drugs ty cumulation (BL5-Evaluate) O5- To evaluate the crude drugs ty cumulation (BL5-Evaluate) O5- To evaluate the crude drugs ty cumulation (BL5-Evaluate) O5- To evaluate the crude drugs ty cumulation (BL5-Evaluate) O5- To evaluate the crude drugs ty cumulation (BL5-Evaluate) O5- To evaluate the crude drugs ty cumulation (BL5-Evaluate) O5- To evaluate the crude drugs ty cumulation (BL5-Evaluate) O5- To evaluate the crude drugs ty cumulation (BL5-Evaluate) O5- To evaluate the crude drugs ty cumulation (BL5-Evaluate) O5- To evaluate the crude drugs ty cumulation (BL5-Evaluate) O5- To evaluate the trude drugs ty cumulation (BL5-Evaluate) O5- To evaluate the trude drugs ty cumulation (BL5-Evaluate) O5- To evaluate the trude drugs ty cumulation (BL5-Evaluate) O5- To evaluate the trude drugs ty cumulation (BL5-Evaluate) O5- To evaluate the trude drugs ty cumulation (BL5-Evaluate) O5- To evaluate the trude drugs ty cumulation (BL5-Evaluate) O5- To evaluate the trude drugs ty cumulation (BL5-Evaluate) O5- To evaluate the trude drugs ty cumulate the trude drugs ty cumulation (BL5-Evaluate) O5- To evaluate the trude drugs ty cumulate the trude drugs ty cumulation (BL5-Evaluate) O5- To evaluate the trude drugs ty cumulation (BL5-Evaluate) O5- To evaluate the trude drugs ty cumulate the trude d							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics X Gender X Human Values X Environment X		SDG (Goals)	SDC3(Good health and well-being) SDC4(Quality education) SDC17(Pathenships for the goals)					
	Part B								

	Part	C		
Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	I Preparation of drugs and intermediates 1 Sulphanilamide 2 7-Hydroxy, 4-methyl coumarin 3 Chlorobutanol 4 Triphenyl imidazole 5 Tolbutamide 6 Hexamine	Experiments	BL3-Apply	9
2	II Assay of drugs 1 Isonicotinic acid hydrazide 2 Chloroquine 3 Metronidazole 4 Dapsone 5 Chlorpheniramine maleate 6 Benzyl penicillin	Experiments	BL6-Create	8
3	III Preparation of medicinally important compounds or intermediates by Microwave irradiation technique	Experiments	BL3-Apply	8
4	IV Drawing structures and reactions using chem draw®	Experiments	BL4-Analyze	8
5	V Determination of physicochemical properties such as logP, clogP, MR, Molecular weight, Hydrogen bond donors and acceptors for	Experiments	BL5-Evaluate	8

Pedagogy

Hours

Contents

Modules

## Part D(Marks Distribution)

			Theory					
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation			
	Practical							
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation			
50	25	35	18	15	8			

	Part E
Books	1. Wilson and Giswold's Organic medicinal and Pharmaceutical Chemistry 2. Foye's Principles of Medicinal Chemistry. 3. Burger's Medicinal Chemistry, Vol I to IV.
Articles	https://pubs.acs.org/journal/jmcmar
References Books	1. Introduction to principles of drug design- Smith and Williams. 2. Remington's Pharmaceutical Sciences. 3. Martindale's extra pharmacopoeia.
MOOC Courses	https://ptel.ac.in/
Videos	Pharmacy India

COs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	-	2	1	-	-	-	-	-	3	-	1	2	1
CO2	3	2		3	1	-	-	-	-	-	2	-	1	2	2
CO3	2	1	-	2	2	-	-	-	-	-	3	-	1	2	2
CO4	2	2	-	1	1	-	-	-	-	-	2	-	-	-	2
CO5	3	1	•	1	1	-	-	-	-	-	1	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course Articulation Matrix



Title of the Course	Pharmacology III	nacology III								
Course Code	BP608P	08P								
	PartA									
Y	2-1	Semester	eu.	Cardita	L	т	Ρ	С		
Tear	310	Semester	601	Credits	0	0	2	2		
Course Type	Lab only	nly								
Course Category	Discipline Core	ine Core								
Pre-Requisite/s				Co-Requisite/s						
Course Outcomes & Bloom's Level	CO1- To remember diff CO2- To understand the CO3- To evaluate the of CO4- To evaluate the of CO5- To evaluate the of	ferent morphological and microscopical characteristic fe e cellular structure of crude drugs, ( <b>BL2-Understand</b> ) crude drugs by quantitative evaluation methods. ( <b>BL5-E</b> rude drugs by physical methods of evaluation. ( <b>BL5-E</b> crude drugs by chemical methods of evaluation.( <b>BL5-E</b>	valures of crude drugs.(BL1-Remember) valuate) aluate) valuate)							
Coures Elements	Skill Development ✓ Entrepreneurship X Employability ✓ Professsonal Ethics X Gender X Human Values X Environment X		SDG (Goals)	SDG3(Good health and well-being)						
	Part B									

Pedagogy

Hours

	Pa	rt C		
Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	1. Dose calculation in pharmacological experiments 2. Antiallergic activity by mast cell stabilization assay	Experiments	BL2-Understand	8
2	<ol> <li>Study of anti-ulcer activity of a drug using pylorus ligand (SHAY) rat model and NSAIDS induced ulcer model. 4. Study of effect of drugs on gastrointestinal motility</li> </ol>	Experiments	BL4-Analyze	8
3	5. Effect of agonist and antagonists on guinea pig ileum 6. Estimation of serum biochemical parameters by using semi- autoanalyzer	Experiments	BL2-Understand	8
4	7. Effect of saline purgative on frog intestine 8. Insulin hypoglycemic effect in rabbit	Experiments	BL3-Apply	8
5	9. Test for pyrogens (rabbit method) 10. Determination of acute oral toxicity (LD50) of a drug from a given data	Experiments	BL3-Apply	8
6	11. Determination of acute skin irritation / corrosion of a test substance 12. Determination of acute eye irritation / corrosion of a test substance	Experiments	BL2-Understand	8
7	13. Calculation of pharmacokinetic parameters from a given data 14. Biostatistics methods in experimental pharmacology (student's t test, ANOVA)	Experiments	BL3-Apply	8

Contents

Part D(Marks Distribution)
Theory

	Theory							
Total Marks         Minimum Passing Marks         External Evaluation         Min. External Evaluation         Internal Evaluation				Min. Internal Evaluation				
	Practical							
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation			
50	25	35	18	15	8			

	. Part E
Books	Rang H. P., Dale M. M., Ritter J. M., Flower R. J., Rang and Dale's Pharmacology, Churchil Livingstone Elsevier 2. Katzung B. G., Masters S. B., Trevor A. J., Basic and clinical pharmacology, Tata Mc Graw-Hill
Articles	https://www.sciencedirect.com/science/article/abs/pii/S0163725804001718
References Books	1 Marry Anne K. K., Lloyd Yee Y., Brian K. A., Robbin L.C., Joseph G. B., Wayne A. K., Bradley R.W., Applied Therapeutics, The Clinical use of Drugs. The Point Lippincott Williams & Wilkins 2. Mycek M.J., Gehert S.B. and Perper M.M. Lippincott's illustrated Reviews- Pharmacology.
MOOC Courses	https://nptel.ac.in/
Videos	Pharmacy india

							Co	urse Articulation	Matrix						
COs	PO1	PO2	PO3	PO4	P05	PO6	P07	P08	PO9	PO10	P011	P012	PSO1	PSO2	PSO3
CO1	3	2	-	-	-	3	-	-	-	-	2	-	1	2	2
CO2	3	1	-	-	-	3	-	-	-	-	3	-	1	2	1
CO3	3	2	-	-	-	2	-	-	-	-	3	-	1	2	1
CO4	2	1	-	-	-	2	-	-	-	-	2	-	-	-	1
CO5	3	2	-	-	-	2	-	-	-	-	1	-	1	-	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Title of the Course	Herbal Drug Technolo	ах						
Course Code	BP609P							
			Part A					
Vor	and	Somostor	6th	Credite	L	т	Ρ	С
iea.	510	Jenester	001	Credits	0	0	2	2
Course Type	Lab only							
Course Category	Discipline Core							
Pre-Requisite/s				Co-Requisite/s				
Course Outcomes & Bloom's Level	CO1- To remember d CO2- To understand f CO3- To evaluate the CO4- To evaluate the CO5- To evaluate the	ifferent morphological and microscopical charact the cellular structure of crude drugs ( <b>BL2-Underr</b> crude drugs by quantitative evaluation methods. crude drugs by physical methods of evaluation. ( crude drugs by chemical methods of evaluation.	eristic features of crude drugs.(BL1-Rememb stand) (BL5-Evaluate) BL5-Evaluate) (BL5-Evaluate)	er)				
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics > Gender X Human Values × Environment X	x	SDG (Goals)	SDG1(No poverty) SDG3(Good heatth and well-being) SDG4(Quality education) SDG4(Becent work and economic growth) SDG17(Plarthreships for the goals)				

## Part B

Pedagogy

Hours

Contents

Modules

	Par	1C		
Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	1. To perform preliminary phytochemical screening of crude drugs. 2. Determination of the alcohol content of Asava and Arista	Experiments	BL3-Apply	12
2	<ol> <li>Evaluation of excipients of natural origin 4. Incorporation of prepared and standardized extract in cosmetic formulations like creams, lotions and shampoos and their evaluation.</li> </ol>	Experiments	BL5-Evaluate	12
3	<ol> <li>Incorporation of prepared and standardized extract in formulations like syrups, mixtures and tablets and their evaluation as per Pharmacopoeial requirements. 6. Monograph analysis of herbal drugs from recent Pharmacopoeias</li> </ol>	Experiments	BL5-Evaluate	12
4	7. Determination of Aldehyde content 8. Determination of Phenol content 9. Determination of total alkaloids	Experiments	BL4-Analyze	12

Part D(Marks Distribution)

									Theory							
Total M	larks		Minim	um Passing Mar	'ks		External Evaluatio	n	N	lin. External Evalu	ation	Inter	nal Evaluation		Min. Internal Evalua	ition
									Practical							
Total M	larks		Minim	um Passing Mar	ks		External Evaluatio	n	N	lin. External Evalu	ation	Inter	mal Evaluation		Min. Internal Evalua	ition
50		25				35			18			15		8		
									Part E							
	Boo	ks		1. Textbo	ok of Pharmacogno	sy by Trease &Evar	ns. 2. Textbook of Pha	armacognosy byTyl	er, Brady & Robber. 3	3. Pharmacognosy b	y Kokate, Purohit and G	okhale				
	Artic	les		https://ww	w.researchgate.net	/publication/891466	8_Herbal_medicine_	Current_status_and	d_the_future							
	Reference	s Books		5. Pharma Horizons	acognosy & Phytocl Publishers, New De	nemistry by V.D.Rar Ihi, India, 2002.	igari 6. Pharmacopoe	eal standards for Ay	rurvedic Formulation (	(Council of Researc	h in Indian Medicine & H	omeopathy) 7. Mukherj	ee, P.W. Quality Control of Hert	oal Drugs: An App	proach to Evaluation of B	otanicals. Business
	MOOC C	ourses		https://npt	tel.ac.in/											
	Vide	os		Pharmacy	/ India											
								с	ourse Articulation	Matrix						
COs	PO1	PO2		PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	P012 PS01	1	PSO2	PSO3

COS	POT	P02	P03	P04	P05	100	P07	P06	POS	POID	POTI	POIZ	P301	P302	P303
CO1	1	2	1	-	-	-	-	-	-	-	-	-	1	2	-
CO2	1	2	1	-		-	-	-	-	-	-	-	1	-	1
CO3	1	2	1	-	-	-	-	-	-	-	-	-	-	2	-
CO4	3	2	1	1		-	-	-	-	-	-	-	1	2	1
CO5	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Title of the Course	Artificial intelligence	in Pharmaceutical						
Course Code	BP611ET							
			Part A					
Yoar	3rd	Somester	eth	Credite	L	т	Р	с
1681	310	Semester	our	Cieuts	3	1	0	4
Course Type	Theory only			·				
Course Category	Discipline Specific E	lective						
Pre-Requisite/s				Co-Requisite/s				
Course Outcomes & Bloom's Level	CO1- To remember CO2- To understand CO3- To evaluate th CO4- To evaluate th CO5- To evaluate th	different morphological and microscopical chara the cellular structure of crude drugs. (BL2-Und e crude drugs by quantitative evaluation method e crude drugs by physical methods of evaluation e crude drugs by chemical methods of evaluation	cteristic features of crude drugs.(BL1-Reme erstand) is.(BL5-Evaluate) n.(BL5-Evaluate) n.(BL5-Evaluate)	mber)				
Coures Elements	Skill Development J Entrepreneurship X Employability J Professsonal Ethics Gender X Human Values X Environment X	x	SDG (Goals)	SDG3(Good health and well-being) SDG4(Quality education) SDG9(Industry Innovation and Infrastructure) SDG17(Partnerships for the goals)				

# Part B

Pedagogy

Hours

Contents

		F	Part D(Marks Distribution)		
			Theory		
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation
100	50	75	38	25	13
			Practical		
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation

	Part E
Books	Harrer S, Menard J, Rivers M, Green DV, Karpiak J, Jeliazkov JR, Shapovalov MV, del Alamo D, Sternke MC. Artificial Intelligence drives the digital transformation of pharma. InArtificial Intelligence in Clinical Practice 2024 Jan 1 (pp. 345-372). Academic Press.
Articles	Patel J, Patel D, Meshram D. Artificial Intelligence in Pharma Industry-A Rising Concept. Journal of Advancement in Pharmacognosy. 2021;1(2).
References Books	Bhupathyragi M, Rani KR, Essa MM, editors. Artificial Intelligence in Pharmaceutical Sciences. CRC Press; 2023 Nov 23.
MOOC Courses	Udemy, coursera, NEPTEL
Videos	YOU TUBE

COs	PO1	PO2	PO3	PO4	P05	PO6	P07	P08	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	-	2	3	-	-	-	-	-	3	-	1	1	2
CO2	2	2	1	•	1	-	-	-	-	-	2	2	1	1	1
CO3	2	3	1	1	1	-	-	-	-	-	1	1	1	1	1
CO4	1	2	1	1	1	-	-	-	-	-	1	1	1	1	1
CO5	1	1	1	1	-	-	-	-	-	-	-	1	1	1	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



								Dritann							
	Title of the Co	ourse	Good Mar	ufacturing in Pharma	3										
	Course Co	de	BP612ET												
								Part A							
										0		L	т	P	С
	Year		3rd		Semester	b	In			Credits		1	0	0	1
	Course Ty	pe	Theory or	ily											
	Course Cate	gory	Discipline	Specific Elective											
	Pre-Requisi	te/s								Co-Requisite/s					
	Course Outco & Bloom's L	omes evel	CO1- To r CO2- To r CO3- To e	emember different m understand the cellul avaluate the crude dr	norphological and mi ar structure of crude rugs by quantitative (	croscopical chara drugs.(BL2-Und avaluation methor	cteristic features of cr erstand) Is.(BL5-Evaluate)	ude drugs.(BL1-F	temember)						
	Coures Elem	ents	Skill Deve Entrepren Employab Professo Gender X Human V Environm	elopment ✓ ieurship X iility ✓ vnal Ethics ✓ : alues ✓ ent X			SDG (Goa	als)	SDG4(Quality educa SDG12(Responsible	tion) consuption and product	ion)				
	Part B														
	Modules         Contents         Pedagogy         Hours														
	Part D(Marks Distribution) Theory Total Marke Minimum Receipe Marke External Evolution Min. External Evolution Min. External Evolution														
Iotal Mar	KS 50	MIN	mum Passing Mar	KS	76	External Evaluat	ion	20	Min. External Evalu	ation	inter	nai Evaluation	49	Min. Internal Evalu	ation
100	50				75			Practical			25		13		
Total Mar	ks	Mini	mum Passing Mar	ke	1	External Evaluat	ion	Flactical	Min External Evalu	ation	Inter	nal Evaluation		Min Internal Evalu	ation
[								Part E							
	Books		Karmacha	arya JB. Good manul	acturing practices (	SMP) for medicina	al products. Promising	Pharmaceuticals	. 2014;101.						
	Articles		Patel KI,	Unotal NP. Pharmaci	eutical GMP: past, p	CMD Desters	-a review. Die Pharm	azie-An internatio	nai Journai of Pharma	ceutical Sciences. 2008.	Apr 1;63(4):251-5.				
	References B	OURS		OURSERA PHARA		Givit <sup>or</sup> Protessiona	н пандроок. Quality F	riess; 2016 May 2	ю.						
	MOOC Cour	ses				-									
	Videos		You tube												
							0	uree Articulatio	on Matrix						
COs	P01	P02	PO3	PO4	P05	P06	P07	PO8	PO9	PO10	P011	P012	PSO1	PSO2	PSO3
CO1	3	-	-	1	2	-	2	2	1	-	3	-	1	1	1
CO2	2	2	-	1	3	-	2	1	1	-	2	-	1	1	1
CO3	1	1	-	1	1	-	1	1	1	-	1	-	1	1	1
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5		-	-	•	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



	Title of the	Course	Industria	I Pharmacy II															
	Course	Code	BP702T																
								Part	4										
	Yea		4th			Semester		7th				Credits		L	т	P C			
-			-											3	1	-1 3			
	Course	туре	Theory	oniy															
	Course Ca	tegory	Discipili	ie Core								Poquicito/c							
	Course Ou & Bloom's	tcomes Level	CO1- To CO2- To CO3- To CO4- To CO5- To	o remember different n o understand the cellu o evaluate the crude d o evaluate the crude d o evaluate the crude d	norphological and m ar structure of crude rugs by quantitative rugs by physical met rugs by chemical me	icroscopical charact drugs.(BL2-Under evaluation methods. thods of evaluation.( thods of evaluation.	eristic features of cr stand) .(BL5-Evaluate) .(BL5-Evaluate) .(BL5-Evaluate)	ude drugs. <b>(BL</b>	I-Remember)										
	Coures Ele	ements	Skill De Entrepri Employ Profess Gender Human Environ	velopment V aneurship X ability V sonal Ethics X X Values X ment X					SDG (Goals)		SDG4(Quality education)								
								Part	В										
	Modu	les				Cont	ents				Pe	dagogy			H	lours			
								Part	0										
Modu	les				Title					Indicative- Experiment Inter	ABCA/PBL/ s/Field work/ nships		Blo	om's Level		Hours			
1		Regulatory requirement	ents and approval						Case Study				BL3-Apply	y 5					
							Pa	nt D(Marks I Theo	Distribution) V										
Total Ma	arks	Mi	nimum Passing Ma	arks		External Evaluation	n		Min. External Evalu	ation	Inte	rnal Evaluation			Min. Internal E	valuation			
100	1	50			75			38			25		13						
								Practi	al										
Total Ma	arks	Mi	nimum Passing Ma	arks		External Evaluation	n		Min. External Evalu	ation	Inte	rnal Evaluation			Min. Internal Ev	valuation			
								Part	E										
	Book	5	1. Interr	ational Regulatory Aff	airs Updates, 2005.	available at http://ww	ww.iraup.com/about	.php 2. Dougla	s J Pisano and David S. I	Mantus. Text book	of FDA Regulatory Affairs A	Guide for Presc	ription Drugs, Medical D	Devices, and	Biologics' Secon	d Edition.			
	Articl	95	5. Regu	atory Affairs from Wik	pedia, the free ency	clopedia modified or	n 7th April available	at http,//en.wik	ipedia.org/wiki/Regulator	y_ Affairs. 6. Inter	national Regulatory Affairs Up	odates, 2005. av	ailable at http://www.ira	up.com/abo	out.php				
	References MOOC Co	urses	3. Intern https://n =&utm_t	ational Regulatory Aff ptel.ac.in/ https://www source=adwords&utm	airs Updates, 2005. .udemy.com/course/ _medium=udemyads	available at http://wv certificate-course-in- s&utm_campaign=Lo	ww.iraup.com/about -drug-regulatory-affi ongTail_la.EN_cc.IN	.php 4.Douglas airs-dra/? IDIA&utm_con	J Pisano and David S. M ent=deal4584&utm_term	antus. Text book	of FDA Regulatory Affairs A G 32537ad_618853564450_	kwde_c	ption Drugs, Medical D	evices, and f	Biologics' Second	Edition.			
	Video	_	121227	230479li_1007795	pd&matchty	pe=&gad_source=18	&gclid=CjwKCAjwt-i	UwBhBnEiwAg	wzrUvsaJ5SOVDqVcWy	So7cw5sJ-Zb7x2l	EpdRy076MNp3jNtdJKIIZ70	RoCu2YQAvD_I	BwE&couponCode=INE	021PM					
L	video	••																	
							Cr	ourse Articul	ition Matrix										
COs	PO1	PO2	PO3	PO4	P05	P06	P07	P08	P09	PO10	P011	PO12	PSO1	F	PSO2	PSO3			
CO1	2	3	2	-	-	-	-	-	-	-	3	-	3	2	2	1			
CO2	3	3	1	-	-	-	-	-	-	-	3	-	3	2	2	1			
CO3	2	2	1	1	-	-	2	-	-	-	3	-	3	3 2 1					
CO4	3	1	1	-	-	-	-	-	-	-	2	-	3	2	2	1			
CO5	2	3	3	-	-	-	-	-	-	-	2	-	1	1	1	-			
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			



	Title of the	Course	Novel Dr	ug Delivery System													
	Course C	ode	BP704T														
								Bo	•								
	Voor		415		Sa	nostor	7	1 ai	~			Credite		L	т	Ρ	С
	Tear		401		36	liester	'					credits		3	1	0	4
	Course 1	ype	Theory o	nly													
	Course Cat	tegory	Disciplin	e Core								Co Requisito/s					
	Pre-Requi	siters	C01 To	romombor difforont	morphological and m	icrosconical characte	ristic footu	ron of anudo druge (P	1 Pomombor)			Co-Requisite/s					
	Course Out & Bloom's	comes Level	CO2- To CO3- To CO4- To CO5- To	evaluate the crude evaluate the crude evaluate the crude	drugs by quantitative drugs by physical me drugs by chemical me	e drugs.(BL2-Unders evaluation methods.( thods of evaluation.(E athods of evaluation.(	tand) BL5-Evalu BL5-Evalu BL5-Evalu	iate) iate) iate)	i Kenlenberj								
			Skill Dev	elopment 🗸													
			Entrepre Employa	neurship X bility √						SDG	22/Good boolth and	d well being)					
	Coures Ele	ments	Professs Gender	onal Ethics X				SDG	(Goals)	SDG	34(Quality educatio	in)					
			Human \	/alues X													
			LINIOII														
Part B Contents												Por	woneb			н	NURS
L															I		
r	1							Par	C		Indicative ARCA/	PPI /	1				
Modu	les				Title					Ē	Experiments/Field Internships	work/		BI	loom's Leve	1	Hours
1		To make model of disir	ntegration						Simulation					BL3-Apply			5
								Part D(Marks The	Distribution)								
Total Ma	arks	Min	imum Passing Ma	rks		External Evaluation			Min. External E	valuation		Inter	nal Evaluation			Min. Internal Eva	aluation
100	ŧ	i0	-		75			38				25		13			
-								Prac	cal			1					
Total Ma	arks	Min	imum Passing Ma	rks		External Evaluation			Min. External E	valuation		Inter	nal Evaluation			Min. Internal Eva	aluation
1																	
								Par	E								
	Book	5	1. N.K. J	ain, Controlled and	Novel Drug Delivery,	CBS Publishers & Dis	stributors, N	New Delhi, First editio	n 1997 (reprint in 200	1). 2. S.P. V	Vyas and R.K. Khar	r, Controlled Drug Deliv	very -concepts a	and advances, Vallabl	h Prakashan	, New Delhi, First ed	lition 2002.
	Article	S	1.Indian	Journal of Pharmac	eutical Sciences (IPA)	2.Indian Drugs (IDM	A) 3. Journ	al of Controlled Rele	se (Elsevier Science	s) 4. Drug D	Development and Ir	ndustrial Pharmacy (Ma	arcel & Decker)	5. International Journ	al of Pharma	aceutics (Elsevier So	ciences
	References	Books	1. Y W. C Mathiowi	hien, Novel Drug D tz, Published by Wi	elivery Systems, 2nd ey Interscience Publi	edition, revised and e cation, John Wiley an	xpanded, f d Sons, Inc	Marcel Dekker, Inc., I c, New York. Chiches	ew York, 1992. 2. Ro ar/Weinheim	binson, J. R	R., Lee V. H. L, Cor	ntrolled Drug Delivery S	Systems, Marcel	I Dekker, Inc., New Yo	ork, 1992. 3.	Encyclopedia of Co	ntrolled Delivery. Edith
	MOOC Co	urses	https://np	tel.ac.in/													
	Video	s	you tube														
CO1	PO1	PO2	PO3	P04	PO5	P06	PO7	Course Articu	ation Matrix	PO1	10	P011	PO12	PS01	1	PSO2	PSO3
C01	2	1	3	-	3	-	-	-	-	-	10	3	-	2		1	1
CO2	2	1	2	-	2			-	-	-		3	-	2		2	2
CO3	3	2	2	1	2			-	-	-		3	-	2		1	1
CO4	2	1	3	-	2	-		-	-			3	-	1		1	1
CO5	2	1	1	1	1	-						2		1		1	1
C06		-				-						-					-
000	-	1-	17	T	17	-	-	17	1-	17		-	1-	1-		-	1.



Title of the Course	Instrumental Methods	s of Analysis											
Course Code	BP705P	05P											
Part A													
Yoar	415	Somestor	7*b	Credite	L	т	Р	с					
iea.	401	Semester	701	Creuts	0	0	2	2					
Course Type	Lab only	nhy in the second se											
Course Category	Discipline Core	cipline Core											
Pre-Requisite/s	Theory of Respective	e Experiments		Co-Requisite/s				-					
Course Outcomes & Bloom's Level	CO1- To remember of CO2- To understand CO3- To evaluate the CO4- To evaluate the CO5- To evaluate the	different morphological and microscopical characte the cellular structure of crude drugs ( <b>BL2-Unders</b> a crude drugs by quantitative evaluation methods.) e crude drugs by physical methods of evaluation. (I e crude drugs by chemical methods of evaluation.)	eristic features of crude drugs.(BL1-Remembe stand) (BL5-Evaluate) BL5-Evaluate) (BL5-Evaluate)	er)									
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics Gender X Human Values X Environment X	x	SDG (Goals)	SDG3(Good health and well-being) SDG4(Quality education) SDG6(Clean water and sanitation) SDG8(Decent work and economic growth)									

1	Part B
Contents	

Modules

	Par	tC		
Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	1 Determination of absorption maxima and effect of solvents on absorption maxima of organic compounds 2 Estimation of dextrose by colorimetry	Experiments	BL2-Understand	8
2	3 Estimation of sulfanilamide by colorimetry 4 Simultaneous estimation of ibuprofen and paracetamol by UV spectroscopy	Experiments	BL4-Analyze	8
3	5 Assay of paracetamol by UV- Spectrophotometry 6 Estimation of quinine sulfate by fluorimetry	Experiments	BL4-Analyze	8
4	7 Study of quenching of fluorescence 8 Determination of sodium by flame photometry	Experiments	BL4-Analyze	8
5	9 Determination of potassium by flame photometry 10 Determination of chlorides and sulphates by nephelo-turbidometry	Experiments	BL4-Analyze	8
6	11 Separation of amino acids by paper chromatography 12 Separation of sugars by thin layer chromatography	Experiments	BL3-Apply	8
7	13 Separation of plant pigments by column chromatography 14 Demonstration experiment on HPLC	Experiments	BL3-Apply	8
8	15 Demonstration experiment on Gas Chromatography	PBL	BL3-Apply	8

Pedagogy

Hours

	Part D(Marks Distribution)												
Theory													
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation								
50	25	35	18	15	8								
			Practical										
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation								

Part E											
Books	1. Vogel's Textbook of Quantitative Chemical Analysis by A.I. Vogel 2. Practical Pharmaceutical Chemistry by A.H. Beckett and J.B. Stenlake										
Articles	NA										
References Books	1. Organic Chemistry by I. L. Finar 2. Organic spectroscopy by William Kemp 3. Quantitative Analysis of Drugs by D. C. Garrett										
MOOC Courses	NA										
Videos	NA										

	Course Articulation Matrix														
COs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	3	1	1	-	1	-	-	-	3	-	1	1	1
CO2	3	1	2	1	1	-	1	-	-	-	3	-	1	1	1
CO3	2	2	2	1	1	-	1	-	-	-	3	-	1	1	1
CO4	2	1	3	1	1	-	1	-	-	-	2	-	1	2	1
CO5	2	1	1	2	1	-	-	-	-	-	3	-	1	1	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



								Di nam								
	Title of the	Course	Practice Scl	hool *												
	Course	Code	BP706PS													
								Part A								
	Yoa		415		Somostor	716			Crodit	-	L	т		Ρ	с	
	Tea	-	401		Semester	701			Credit	5	0	0		6	6	
	Course	Туре	Project													
	Course Ca	tegory	Discipline C	Core												
	Pre-Requ	isite/s	In the VII se evenly distr domains for	emester, every can ibuted throughout t r practice school de	didate shall undergo pr he semester. The stud sclared by the program	actice school for ant shall opt for a committee from t	a period of 150 hours ny one of the time to time.		Co-Requis	ite/s	every studer 25 pages). A acquired by and grade po	It shall submit a print long with the exams the student through p pints shall be awarde	ed report (in tr of semester V rractice school d.	riplicate) on the (II, the report s I shall be evalu	e practice school he/she submitted by the student uated by the subject exp	e attended (not more than , knowledge and skills perts at the college level
	Course Ou & Bloom's	tcomes i Level	CO1- To rei CO2- To un CO3- To ev CO4- To ev CO5- To ev	member different m iderstand the cellul valuate the crude dr valuate the crude dr valuate the crude dr	orphological and micro ar structure of crude dr ugs by quantitative eva ugs by physical metho ugs by chemical metho	scopical characteristic features of crude drugs (BL1-Remember) ugs (BL2-Understand) alustion methods (BL5-Evaluate) ds of evaluation (BL5-Evaluate) of s of evaluation (BL5-Evaluate)										
	Coures El	ements	Skill Develc Entreprene Employabil Professson Gender ✓ Human Val Environmer	opment √ urship X ity √ al Ethics X ues √ nt X		s	DG (Goals)	SDG1(No p SDG3(Good SDG4(Quali SDG6(Clean SDG8(Dece SDG17(Part	overty) I health and well-being) Ity education) n water and sanitation) nt work and economic g Inerships for the goals)	rowth)						
	Part B															
	Modi	lles				Cont	ents			P	edagogy			Hours		
								Part C								
Modu	lles				Title					Indicative-ABCA Experiments/Fiel Internship	/PBL/ d work/		Bloom's Level			Hours
1		Practice School						F	ield work							5
							Part	D(Marks Di	stribution)							
					-			Theory			1					
Total M	arks	Mir	nimum Passing Marks	5	Ex	ernal Evaluation	1		Min. External Evalua	tion	Inte	ernal Evaluation		Min. Internal Evaluation		
		J			U			Practica	4							
Total M	arko	Mir	nimum Passing Marke		Ev	ornal Evaluation		Practica	Min. Extornal Evalua	tion	Intr	real Evaluation			Min. Internal Eval	untion
150	uno	75	initian r dooring marks		100		. 50				50			25		
								Part F								
	Book	s	Please refe	r Library and Interr	iet											
	Articl	96	Refer to the	Library and Intern	et											
	References	Books	Please refe	r Library and Intern	et											
	MOOC Co	urses	NA													
	Video	s	Refer Librar	ry and Internet, NP	TEL, YOU TUBE											
							-									
COs	PO1	PO2	P03	PO4	P05 P	06	PO7 I	se Articulat PO8	PO9	PO10	P011	P012	PSO1		PSO2	PSO3
CO1	2	-	2	1	1 1		2	2	-	-	3	-	2		1	1
CO2	2	-	1	1					-	-	2	-	1		1	1
CO3	1	-	1	-	1 -				-	-	2	-	-		1	1
CO4	1	1	1	1	1 -				-	-	3	-			1	1
CO5	3	-	1	1					1	-	2	-			-	-
CO6	-	-	-	-					-	-	-	-	-		-	-
*			-													



	Title of "	C	Dis statis (	and December 11 11												
	Title of the	Course	Biostatistics a	and Research Meth	iodology											
	Course	Lode	BP8011													
							1	Part	A							
	Yea	r	4th		Semester	r	8th				Credit	5	L 3	T 1	P 0	C 4
	Course	Туре	Theory only										1			
	Course Ca	itegory	Discipline Co	re												
	Pre-Requ	isite/s									Co-Requis	ite/s				
	Course Outcomes & Bloom's Level CO2- To remember different morphological and microscopical divarkativities (fautures of crude drugs. ( CO2- To availate the crude drugs by guantitative evaluation methods (BLE-Evaluate) CO2- To evaluate the crude drugs by physical methods of evaluation.(BLE-Evaluate) CO2- To evaluate the crude drugs by physical methods of evaluation.(BLE-Evaluate) CO2- To evaluate the crude drugs by physical methods of evaluation.(BLE-Evaluate)															
	Skill Development ✓ Entrepreneuralip X Employability ✓ Professional Ethics X Gender X Human Values X Environment X								s) SDG1(No poverty) SDG4(Duality education) SDG8(Decent work and economic growth) SDG3(Pertnerships for the goals)							
Part B																
	Mod	iles				Cont	ents					Pedagogy			H	ours
Part C																
Modul	Modules Title								Indicative-ABCA/PBL/ Experiments/Field work/ Internships				Bloom's I	Hours		
1		hands on practical of MS	Excel and SPSS						Simulation				BL2-Understa	nd		3
Part C																
Part C Indicative-ABCA/PBL/																
Modu	les				Title						Experiments/Field Internships	work/		Bloom's	Level	Hours
UNIT-4		High Performance Liqui	d chromatography						PBL				BL4-Analyz	e		10
							Pa	rt D/Marke [	Distribution	)						
							T di	Theo	у	/						
Total Ma	arks	Minir	num Passing Marks		E	External Evaluation	1		Min. Ext	ernal Evaluation	n	Internal Eva	luation	ation Min. Internal Ev		
100		50			75		3	18				25	13			
					1			Practi	al							
Total Ma	arks	Minir	num Passing Marks		E	External Evaluation	1		Min. Ext	ernal Evaluation	n	Internal Eva	luation		Min. Internal Ev	aluation
1																
								Part	=							
	Bool	s	1. Pharmacer	utical statistics- Pra	actical and clinical a	applications, Sanfor	d Bolton, publisher M	/arcel Dekker	L Inc. NewYorl	k. 2. Fundamenta	al of Statistics – Hima	laya Publishing House- S.C.O	iuptha			
	Artic	es	datatab.net ht	ttps://www.ijdrt.com	varticles/biostatistic	csresearch-metho	dology-with-an-over	view-on-clinica	I-research.po	lf						
	Reference	Books	1. Design and	d Analysis of Experi	iments – PHI Learni	ing Private Limited,	R. Pannerselvam, 2	. Design and /	Analysis of Ex	periments – Wile	ey Students Edition,	Douglas and C. Montgomery				
	MOOC C	ourses	https://nptel.a	ic.in/ datatab.net												
Videos You tube																
COs	PO1	PO2	P03	104	P05	PO6	Co PO7	urse Articula	ation Matrix		210	P011 P017		01	PSO2	PSO3
005	2	2	1 P		2	1	101	- 30	P-09	PL	510	2	P		1	1
CO2	2	1	1 2		3 1					-		2	1		1	1
C03	3	1	1 4		3	1	-						4		1	1
CO4	2	1	1		3	1				-		1			1	2
CO5	2	1	1 2		3	1	-		-	-		1	- 1		2	2
0.06	1	-	. 2		-		-					-			-	-
1	I						I	1	1	-		-	-			1



								-										
	Title of the	Course	Pharm	a Marketing Manage	ment													
	Course C	ode	BP803	ET														
								Part A										
	Voar		4th			omostor	8th				Credits		L	T P	С			
													3	1 0	4			
	Course 1	ype	Theor	r only														
	Course Ca	tegory	Discip	ine Electives						Co. Desviation								
	Pre-Requi	site/s								Co-Requisite/s								
COT- to remember diterent morphological and microscopical characteristic features of crude drugs (BL1-Remember) CO2-To understand the calluter structure of crude drugs, (BL2-Understand) CO2-To evaluate the crude drugs by quantitative evaluation methods, (BL-S-tvaluate) CO2-To evaluate the crude drugs by chemical methods of evaluation (BL-S-tvaluate) CO2-To evaluate the crude drugs by chemical methods of evaluation (BL-S-tvaluate)																		
	Coures Ele	ments	Skill D Entrep Emplo Profes Gende Huma Enviro	evelopment ✓ reneurship ✓ yability ✓ ssonal Ethics ✓ r × n Values × nment ×				SDG (Go	oals)	SDG1(No poverty) SDG2(Zero hunger) SDG3(Good health a SDG4(Quality educa SDG17(Partnerships	ind well-being) tion) for the goals)							
Part B																		
	Modu	les				Conter	nts				Pe	dagogy		н	lours			
	Part C																	
Modu	les				Title					Indicative-ABC Experiments/Fie Internship	Indicative-ABCA/PBL/ Experiments/Field work/ Internships			Bloom's Level				
1		Market survey about (	drugs, OTC, Antib	otic etc				PI	BL				BL5-Evaluate		10			
								Part D(Marks Dis	tribution)									
Total M	arks	Mir	nimum Passing M	larks		External Evaluation		Theory	Min. External Eval	ation	Inter	mal Evaluation		Min. Internal Ev	valuation			
100		i0			75			Min. External Evaluation			25			13				
		-						Practical										
Total Ma	arks	Mir	nimum Passing N	larks		External Evaluation		Min. External Evaluation			Internal Evaluation			Min. Internal Evaluation				
								Dort E										
	Book	5	1.Phili	Kotler and Kevin L	ane Keller: Marketin	Management, Prentice	Hall of India	, New Delhi 2.Walker, I	Boyd and Larreche : N	larketing Strategy- Plan	ning and Implementation	n, Tata MC Graw	Hill, New Delhi.		1			
	Article	s	NA															
	References	Books	1. Arur	Kumar and N Mena Jew Delhi	akshi: Marketing Man	agement, Vikas Publishir	ng, India 2. I	Rajan Saxena: Marketir	ng Management; Tata	MC Graw-Hill (India Edi	tion) 3. Ramaswamy, U.	S & Nanakamari	i, S: Marketing Managem	ent: Global Perspective, Inc	tian Context, Macmilan			
	MOOC Co	urses	https://	nptel.ac.in/ https://w	ww.udemy.com/cour	se/pharmaceutical-sales-	and-marketi	ing/										
	Video	s						-										
r	1		1	-				Course Articulati	on Matrix	1	1	1						
COs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	P09	PO10	PO11	PO12	PSO1	PSO2	PSO3			
001	3	2	1	-	2	2	1	1	-	2	1	-	2	1	1			
002	2	4	4	-	1	2	•	1	-	1	1	-	1	1	1			
CO4	3	1	2					1		-	2	E	1	1	1			
C05	2	2	1	-	1	2	1	1		2	1		1	1	-			
C06	-	1.			-	-		-	-L	-	-	L	-	-	-			
	1	1	1	1.1				1	1	1		1	1-	1	1			


#### Syllabus-2023-2024 BPharm

								Drinarin									
	Title of the	Course	Pharr	nacovigilance													
	Course C	ode	BP80	5ET													
								Part A									
								FdILA					L	Т		P	с
	Year		4th		Seme	ster	8th				Credit	S	3	1		0	4
	Course 1	ype	Theo	ry only												1	1
	Course Ca	tegory	Disci	pline Electives													
	Pre-Requi	site/s									Co-Requis	site/s					
	Course Out & Bloom's	comes Level	CO1 CO2 CO3 CO4 CO5	To remember differ To understand the To evaluate the cru To evaluate the cru To evaluate the cru	ent morphological an cellular structure of cr de drugs by quantitat de drugs by physical de drugs by chemical	I microscopical charact ude drugs.(BL2-Under ve evaluation methods nethods of evaluation.) methods of evaluation.	eristic features of cr stand) .(BL5-Evaluate) (BL5-Evaluate) .(BL5-Evaluate)	rude drugs.(BL1-F	temember)								
	Coures Ele	ments	Skill Entre Empl Profe Geno Hum Envir	Development ✓ preneurship X oyability ✓ isssonal Ethics ✓ ler X an Values X onment X			s	DG (Goals)	SDG SDG SDG SDG	1(No poverty) 4(Quality educ 8(Decent wort 11(Sustainable 17(Partnership	) ication) rk and economic g ile cities and econ ips for the goals)	rowth) omies)					
								Part B									
	Modu	les			Part B         Pedagogy           Contents           Part C           Indicative-ABCA/PBL/           Title         Bit											н	ours
								Part C									
Modul	les				Contents         Pedagogy         Hours           Part C           Title         Indicative-ABCA/PBL/ Experimentu/Field work/ Internahips         Bloom's Level         Image: Colspan="2">S           PBL         PBL         BL3-Apply         S											Hours	
1		ADR Reporting proce	dure in ITM hosp	oital				PE	BL					BL3-Apply			5
							-										
L							Pa	art D(Marks Dis	tribution)								
Total Ma	arks	Mir	nimum Passing	Marks		External Evaluatio	n	Theory	Min. External	Evaluation		Inter	nal Evaluation			Min. Internal Ev	aluation
100		10			75			38				25			13		
								Practical									
Total Ma	arks	Mir	nimum Passing	Marks		External Evaluatio	n		Min. External	Evaluation		Inter	nal Evaluation	1		Min. Internal Ev	aluation
t																	
								Part F									
	Book	5	1.Tex Stepl	tbook of Pharmacov nens' Detection of N	igilance: S K Gupta, w Adverse Drug Rea	laypee Brothers, Medic ctions: John Talbot, Pa	al Publishers. 2. Pr trick Walle, Wiley P	actical Drug Safet	y from A to Z By	Barton Cober	rt, Pierre Biron, Jo	ones and Bartlett Publis	shers. 3. Mann's	s Pharmacovigilan	ce: Elizabeth	B. Andrews, Nicholas,	Wiley Publishers. 4.
	Article	S	12.htt	p://www.whournc.or	/DynPage.aspx?id=	05825&mn1=7347&mr	12=7259&mn 3=729	97 13. http://www.i	ch.org/ 14. http:	//www.cioms.c	ch/ 15. http://cdsc	o.nic.in/ 16. http://www.	who.int/vaccine	e_safety/en/ 17. ht	tp://www.ipc.g	gov.in/PvPI/pv_home.h	tml
	References	Books	8.A Te Moha	extbook of Clinical P nta and PK Manna	narmacy Practice -Es	sential Concepts and S	kills:G. Parthasarat	hi, Karin NyfortHa	nsen,Milap C. N	ahata 9. Natio	onal Formulary of	India 10. Text Book of	Medicine by Ya	shpal Munjal 11. T	ext book of Pl	harmacovigilance: con	cept and practice by GP
	MOOC Co	urses	https:	//nptel.ac.in/													
	Video	s	Refer	You tube and other	lectures												
-																	
							C	ourse Articulatio	on Matrix	1-	-						
COs	P01	P02	PO3	PO4	P05	P06	P07	P08	PO9	P010	0	P011	P012	PSO1		PS02	PSO3
001	-	2	4	-	4	2	2	4		-		-	-	1		1	1
002	-	2	4	-	1	2	2	4		-		-	-	1		1	2
003	-	1	1	-	2	2	2	1		-		-	-	1		1	2
CO4	-	1	1	-	1	2	2	1		-		-	-	1		1	1
CO5	-	1	1	-	2	2	1	2		-		-	-	1		-	-1
CO6	-	-	-	-	-	-	-	-	-	-		-	-	-		-	-



								B	Pharm										
	Title of the	e Course	Quality C	ontrol and Standardiz	ation of Herbals														
	Course	Code	BP806ET																
								F	Part A										
	Ye	ar	4th		Sen	nester	8th						Credits		L 3	T 1	1	P 0	C 4
	Course	э Туре	Theory o	nly															1
	Course C	ategory	Discipline	Electives															
	Pre-Req	uisite/s											Co-Requisite/s						
	Course O & Bloom	utcomes 's Level	CO1- To CO2- To CO3- To CO4- To CO5- To	remember different n understand the cellul avaluate the crude di avaluate the crude di avaluate the crude di	norphological and m ar structure of crude rugs by quantitative rugs by physical me rugs by chemical me	icroscopical characte e drugs.(BL2-Unders evaluation methods.( thods of evaluation.( ethods of evaluation.)	eristic features o stand) (BL5-Evaluate) BL5-Evaluate) (BL5-Evaluate)	of crude drugs ) ) )	s.(BL1-R	temember)									
	Coures E	lements	Skill Dev Entrepret Employal Professa Gender > Human V Environm	elopment ✓ eurship X bility ✓ bnal Ethics ✓ t alues X ent X				s	SDG (Go	als)	SDG2(Z SDG3(G SDG4(G	Zero hunger) Good health and Quality educatio	l well-being) n)						
								P	Part B										
	Mod	lules		Part B Pedagogy Hours												rs			
				Contents Pedagogy Hours Part C															
Modu	les				Title						Ind Expe	licative-ABCA/l eriments/Field Internships	PBL/ work/			Bloom's	Level		Hours
1		TLC preparation and de	termination of vari	ous crude drug					Ex	periments					BL4-Analyz	te			5
(								Part D(Mar	irks Dist	tribution)									
					1			т	Theory										
Total Ma	arks	Minii	num Passing Mai	ks	76	External Evaluation	1			Min. External Evalua	ation		Inter	nal Evaluation		10	Min. Int	ernal Evalı	lation
100		50			75			38					25			13			
Total M	arks	Mini	num Passing Mar	ke .		External Evaluation		PT	ractical	Min External Evalua	ation		Inter	nal Evaluation			Min Int	ornal Eval	ation
Totaria	ano		num r ussing mu	NO		External Evaluation							interi						auon
								_											
	Boo	oks	1. Pharm Guideline	acognosy by Trease s on Quality of Herb	and Evans 2. Pharm al Medicinal Product	nacognosy by Kokate Is/Traditional Medicin	e, Purohit and G al Products,	F Gokhale 3. Rar	Part E Ingari, V.I	D., Text book of Pharm	acognosy	y and Phytoche	mistry Vol. I , Carrier P	ub., 2006. 4. A	grawal, S.S	S., Herbal Drug T	echnology. Unive	ersities Pre	s, 2002. 5. EMEA.
	Artic	les	9. WHO. Traditiona Geneva, 2	The International Pha I, Complementary ar 2004.	armacopeia, Vol. 2: 0 nd Alternative Medici	Quality Specifications ine. 2 vol. set. Vol. 1	s, 3rd edn. Worl contains text ar	rld Health Orga and Vol. 2, map	anization ps. World	n, Geneva, 1981. 10. W d Health Organization,	/HO. Qual Geneva, 2	lity Control Met 2005. 12. WHO	hods for Medicinal Plan . Guidelines on Good /	nt Materials. We Agricultural and	orld Health ( Collection F	Organization, Ge Practices (GACP	neva, 1999. 11. ) ) for Medicinal P	WHO. WHO lants. World	) Global Atlas of I Health Organizatio
	Reference	es Books	6. Mukhe Journal of WHO Reg	jee, P.W. Quality Co Phytomedicine 1(20 jional office for the W	ntrol of Herbal Drugs 09); p. 4-8. 8. WHO /estern Pacific, Man	s: An Approach to Ev. . Quality Control Met ila, 1998.	aluation of Bota hods for Medici	anicals. Busine cinal Plant Mate	iess Horiz terials, W	zons Publishers, New I /orld Health Organizati	Delhi, Indi on, Genev	ia, 2002. 7. Shii va, 1998. WHO	nde M.V., Dhalwal K., f . Guidelines for the Ap	Potdar K., Maha propriate Use c	adik K. Appli f Herbal Me	ication of quality dicines. WHO Re	control principles egional Publicati	s to herbal ons, Weste	Irugs. International m Pacific Series No
	MOOC C	ourses	https://npl	el.ac.in/															
	Vide	205	NA																
	-							-				-							
	1			1				Course Art	ticulatio	on Matrix					-				
COs	P01	P02	P03	PO4	P05	P06	P07	P08		P09	PO10		P011	P012	P.	501	PSO2		PSO3
CO1	2	2	3	1	1	-	-	-		-	-		2	-	1		1		1

CO1	2	2	3	1	1	-	-	-	-	-	2	-	1	1	1
CO2	2	2	3	1	1	-	-	-	-	-	2	-	1	1	1
CO3	1	1	2	1	1	-	-	-	-	-	1	-	1	1	1
CO4	1	1	1	1	1	-		-	-	-	2	-	1	2	-
CO5	1	1	1	1	-	-	-	-	-	-	1	-	1	1	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



#### Syllabus-2023-2024 BPharm

· · · · · · · · · · · · · · · · · · ·																			
	Title of the	Course		Computer Aided Dru	g Design														
	Course	Code		BP807ET															
									Part	Δ									
	Yea	r		4th		Semester		8th	1 art			Credi	ts	L 3	T		P 0	C 4	
	Course	Туре		Theory only															
-	Course C	ategory		Discipline Electives															
	Pre-Requ	iisite/s										Co-Requi	isite/s						
	Course Ou & Bloom's	itcomes s Level		CO1- To remember CO2- To understand CO3- To evaluate th CO4- To evaluate th CO5- To evaluate th	different morph I the cellular stri e crude drugs b e crude drugs b e crude drugs b	ological and microsco ructure of crude drugs by quantitative evalua by physical methods o by chemical methods	copical charac s.( <b>BL2-Unde</b> ation methods of evaluation s of evaluation	cteristic features of c rrstand) s.(BL5-Evaluate) I.(BL5-Evaluate) n.(BL5-Evaluate)	crude drugs. <b>(Bl</b>	L1-Remer	mber)								
	Coures El	ements		Skill Development J Entrepreneurship X Employability J Professsonal Ethics Gender X Human Values X Environment X	×			SDG	9 (Goals)		SDG3(Good healt SDG4(Quality edu SDG9(Industry Inr	th and well-being) ucation) novation and Infra	istructure)						
									Part	в									
	Mod	ules					Cor	ntents					1	Pedagogy				Hours	
					Contents Pedagogy Hours Part C														
Modu	les				Tit	lle						Indicative-A Experiments Interns	BCA/PBL/ /Field work/ ships			Bloom's	Level		Hours
1		CADD Workshop a	nd drug desig	jn						Experim	ients				BL3-Apply			4	
Total Ma	arks	50	Minimum Pas	ssing Marks	7	Exterr	nal Evaluatio	on	Part D(Marks Theo 38	Distribut ory Min.	tion) . External Evaluati	ion	25	ternal Evaluatio	n	13	Min. Interna	I Evaluation	
						-			Pract	ical									
Total Ma	arks	1	Minimum Pas	ssing Marks		Extern	mal Evaluatio	on	11400	Min.	. External Evaluati	ion	In	ternal Evaluatio	n		Min. Interna	Evaluation	
	Bool	ks		1. Robert GCK, ed., Lippincott, New York	"Drug Action at c. 4. Foye WO "	t the Molecular Level" Principles of Medicina rticles/PMC5248982/	l" University F nal chemistry /	Prak Press Baltimore 'Lea & Febiger. 5. K	Part e. 2. Martin YC. Koro Ikovas A, E	E. . "Quantita Burckhalte	ative Drug Design* er JH. *Essentials of	Dekker, New Yorl f Medicinal Chem	k. 3. Delgado JN, Remers istry" Wiley Interscience.	s WA eds "Wilson	& Gisvolds's Tex	t Book of Org	ganic Medicinal & Ph	armaceutical C	Themistry"
	Reference	s Books		6. Wolf ME, ed "The	Basis of Medici	inal Chemistry, Burge	er's Medicina	I Chemistry" John V	Viley & Sons, N	ew York.	7. Patrick Graham,	L., An Introductio	n to Medicinal Chemistry	, Oxford Universi	ty Press. 8. Smit	n HJ, William	s H, eds, "Introductio	n to the princip	les of Drug
	MOOC C	ourses		https://nptel.ac.in/	on, 9. Silvermar	н к.в i ne organic C	Criemistry of I	Drug Design and Dr	rug Action: Aca	uemic Pre	ISS NEW YORK								
	Vide	 DS																	
L																			
								C	Course Articul	lation Ma	atrix								
COs	PO1	PO2	PO3	PO4	POS	5 PO6	6	P07	PO8	P	PO9	PO10	P011	PO12	PSO	1	PSO2	PSO	3
CO1	2	2	2		1	1		-	-	1		1	2	-	1		1	2	-
CO2	1	2	1	-	2	1		-	-	1		2	2	-	1		1	-	
CO3	1	2	1	-	1	1		-	-	-		-	1	-	1		2	2	
CO4	1	2	1	-	2	-		-	-	1		1	2	-	1		2	1	
CO5	1	2	1	-	1	1		-	-	-		1	1	-	1		1	1	
1	1			-				-	-	-		-	-	-	-				-



#### Syllabus-2023-2024 BPharm

								Diffic									
	Title of the	Course	Cosmetic	Science													
	Course (	Code	BP809ET														
								Part	۵								
								T div	~				L	Т		Р	С
	Year		4th		Semeste	r	8th				Credit	5	3	1		0	4
	Course	Гуре	Theory or	nly												-	-
	Course Ca	tegory	Discipline	Electives													
	Pre-Requi	site/s									Co-Requis	site/s					
	Course Ou & Bloom's	comes Level	CO1- To CO2- To CO3- To CO4- To CO5- To	remember different n understand the cellul evaluate the crude di evaluate the crude di evaluate the crude di	norphological and m ar structure of crude rugs by quantitative rugs by physical me rugs by chemical me	icroscopical characte drugs.(BL2-Unders evaluation methods. thods of evaluation.( athods of evaluation.	eristic features of cru stand) (BL5-Evaluate) BL5-Evaluate) (BL5-Evaluate)	ude drugs. <b>(Bl</b>	1-Remember	r)							
	Coures Ele	ments	Skill Deve Entreprer Employat Professo Gender X Human V Environm	elopment 🗸 neurship 🗸 pility 🗸 pnal Ethics X t alues X ent X			SC	OG (Goals)		SDG4(Quality SDG8(Decent	reducation) t work and economic g	rowth)					
								Part	в								
	Modu	les				Cont	ents					Ped	lagogy			Ho	urs
								Part	с								
Modu	les				Title						Indicative-ABCA Experiments/Field Internships	PBL/ work/			Bloom's Lev	vel	Hours
1		Preapartion of some c	osmetics						Experiments					BL3-Apply			10
							Pa	rt D(Marks	Distribution)	)							
Total M	arks	Min	imum Passing Mar	ire.		External Evaluation		Theo	ny Min Exte	ornal Evaluatio	0.0	Interr	nal Evaluation			Min Internal Eval	uation
100	anto	50	intain r aboing mar		75	External Evaluation		3.8	IIII. EAU			25		. 1	3		uuuon
								Pract	cal						-		
Total Ma	arks	Min	imum Passing Mar	ks		External Evaluation	1		Min. Exte	ernal Evaluatio	on	Interr	nal Evaluation			Min. Internal Eval	uation
<u> </u>			-														
								D	-								
	Book	s	1) Harry's Tata Publ	Cosmeticology, Will ishers.	kinson, Moore, Seve	enth Edition, George	Godwin. 2) Cosmeti	ics – Formula	tions, Manufac	cturing and Qua	ality Control, P.P. Shar	ma, 4th Edition, Vandar	na Publications	s Pvt. Ltd., Delhi. 3)	Text book of	cosmelicology by Sanji	u Nanda & Roop K. Khar,
	Article	95	Internation	nal Journal of Cosme	etic Science												
	References	Books	1) Harry's Tata Publi	Cosmeticology, Wilk shers.	inson, Moore, Seve	nth Edition, George	Godwin. 2) Cosmeti	ics – Formulat	ions, Manufac	turing and Qua	ality Control, P.P. Shar	ma, 4th Edition, Vandan	a Publications	Pvt. Ltd., Delhi. 3)	Text book of c	cosmelicology by Sanju	I Nanda & Roop K. Khar,
	MOOC Co	urses	https://npt	el.ac.in/													
	Video	s	NA														
			1				Co	ourse Articul	ation Matrix	:						1	
CUS	1	4	1	2	100	rub	PU/	1-08	109	,	FOID	4	P012	201		1	1
001	1	1	1	2	-		-		1		-	2	-	4		1	1
002	1	1		-	-						-	2	-			1	
CO4	1	1	1		1	l.					_	-		-			1
C05	1	1	1		1		-	-	1		-	1	-			1	1
006	Ľ		Ľ	-		l.					_			-		Ľ	1
000	17	1	1-	1.	-	1	-	1	1-	-	-	1-	1	-		1	17



								BPhari	n							
	Title of the	Course	Experiment	tal Pharmacology												
	Course	Code	BP810ET													
								Part A								
								T dit?				L	т		Р	С
	Yea	r	4th		Semester	81	h			Credits		3	1		0	4
	Course	Туре	Theory onl	ly												
	Course Ca	itegory	Discipline	Electives												
	Pre-Requ	isite/s								Co-Requisite/s						
	Course Ou & Bloom's	tcomes s Level	CO1- To re CO2- To u CO3- To e CO4- To e CO5- To e	emember different n nderstand the cellu valuate the crude d valuate the crude d valuate the crude d	norphological and mi lar structure of crude rugs by quantitative e rugs by physical met rugs by chemical me	croscopical chara drugs.(BL2-Unde avaluation method hods of evaluation thods of evaluation	cteristic features of c erstand) Is.(BL5-Evaluate) I.(BL5-Evaluate) I.(BL5-Evaluate)	rude drugs.(BL1	Remember)							
	Coures El	ements	Skill Devel Entreprene Employabi Professsor Gender X Human Va Environme	lopment ✓ eurship X liity ✓ nal Ethics X lues X ent X			SDG (Go	oals)	SDG3(Good health ar SDG4(Quality educati SDG8(Decent work ar SDG12(Responsible of SDG17(Partnerships f	nd well-being) ion) nd economic growth) consuption and producti for the goals)	ion)					
								Part B								
	Mode	iles				Co	ntents				Pe	dagogy			Но	irs
								Part C								
Modul	es				Title					Indicative-ABCA Experiments/Field Internships	/PBL/ I work/			Bloom's Lev	vel	Hours
1		ANOVA Using SPSS	/Graph Pad					5	Simulation				BL3-Apply			3
							Pa	art D(Marks Di	istribution)							
Total Ma	irks	Mi	nimum Passing Mark	18		External Evaluati	on	Theory	Min. External Evalua	tion	Inter	nal Evaluation			Min. Internal Eval	uation
100		50			75			38			25			13		
								Practica	al							
Total Ma	irks	Mi	nimum Passing Mark	s		External Evaluati	on		Min. External Evalua	tion	Inter	nal Evaluation			Min. Internal Eval	uation
İ																
								Part F								
	Book	:5	1. Fundam	entals of experime	ntal Pharmacology-b	y M.N.Ghosh 2. H	and book of Experim	ental Pharmacol	ogy-S.K.Kulakarni 3. CPC	CSEA guidelines for lab	oratory animal facility.					
	Articl	es	https://www	v.sciencedirect.com	/book/978148323266	69/screening-meth	nods-in-pharmacolog	у								
	References	Books	4. Drug dis	covery and Evaluat	ion by Vogel H.G. 5.	Drug Screening N	lethods by Suresh K	umar Gupta and	S. K. Gupta 6. Introductio	on to biostatistics and re	search methods by PS	S Sundar Rao a	nd J Richard			
	MOOC Co	ourses	https://npte	l.ac.in												
	Video	os	You tube													
							-									
COs	PO1	PO2	P03	P04	P05	PO6	P07	PO8	PO9	PO10	P011	P012	PSO1		PSO2	PSO3
C01	2	1	1	-	1	1	-	-	-		2	-	3		1	2
CO2	2	1	1		2	1	-	-	-	-	1	-	3		1	2
CO3	2	1	1	-	2	-	-	-	-	-	1	-	3		1	2
CO4	2	1	1	-	-	1	-	-	-	-	2	-	3		1	2
CO5	2	1	1		2		-	-	-	-	1	-	3		1	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-



### Syllabus-2023-2024 BPharm

	Title of the C	ourse	Advanc	ed Instrumentation Te	echniques												
	Course Co	ode	BP811E	T													
								Part	۵								
								Fait	A				L	т	Р	С	
	Year		4th		Se	mester	8	lth			Credits		3	1	0	4	
	Course Ty	De .	Theory	only									-		-	1.	
	Course Cate	HOLY	Discipli	ne Electives													
	Pre-Requis	ite/s									Co-Requisite/s						
	Course Outo & Bloom's I	omes .evel	C01- T C02- T C03- T C04- T C05- T	o remember different o understand the cell o evaluate the crude o evaluate the crude o evaluate the crude o evaluate the crude	morphological and m ular structure of crude drugs by quantitative drugs by physical me drugs by chemical me	icroscopical characteri e drugs. ( <b>BL2-Underst</b> evaluation methods. ( <b>B</b> thods of evaluation. ( <b>B</b> ethods of evaluation. ( <b>B</b>	stic feature and) L5-Evalua L5-Evalua L5-Evalua	res of crude drugs.(BL ate) ate) ate)	1-Remember)		<u> </u>						
	Coures Elen	nents	Skill De Entrepr Employ Profess Gender Human Enviror	velopment V reneurship X rability V sonal Ethics X Values X iment X				SDG	(Goals)	SDG4(Quality SDG15(Life or SDG17(Partne	education) I land) Irships for the goals)						
								Part	В								
	Module	95		Part B Contents Pedagogy Hours												ours	
								Part	с								
Modules				Part C Title Indicative-ABCAPBL/ Experiments/Field work/ Internative-ABCAPBL/ Experiments/Field work/ Bloom's Level Hours													
1	s	tandard curve using U	v						Experiments				BL3-Apply			4	
[								Part D(Marks I	Distribution)								
								Theo	ry								
Total Marks	1	Mini	mum Passing M	arks		External Evaluation			Min. External Evalu	ation	Inte	rnal Evaluation			Min. Internal Ev	aluation	
100	50	)			75			38			25		13				
					- 1			Practi	cal								
Total Marks	,	Mini	mum Passing M	arks		External Evaluation			Min. External Evalu	ation	Inte	rnal Evaluation			Min. Internal Ev	aluation	
								Part	E								
	Books		1. Instr	umental Methods of (	Chemical Analysis by	B.K Sharma 2. Organic	spectroso	copy by Y.R Sharma 3	3. Text book of Pharmaceu	itical Analysis by	Kenneth A. Connors 4. Vogel	's Text book of Q	luantitative Chemica	I Analysis by A	A.I. Vogel		
	Articles		https://v	www.researchgate.ne	t/publication/3277516	81_Advanced_Instrum	entation_a	and_lts_Uses									
	References I	Books	6. Orga	nic Chemistry by I. L.	Finar 7. Organic spe	ctroscopy by William K	emp 8. Qu	uantitative Analysis of	Drugs by D. C. Garrett 9.	Quantitative Anal	ysis of Drugs in Pharmaceuti	cal Formulations	by P. D. Sethi				
	MOOC Cou	rses	https://r	ptel.ac.in/courses/10	4106122												
	Videos		https://v	www.youtube.com/wa	tch?v=ZMtH-xO2Fv0	&list=PL-IQezHLOAj4q	6tsVPE1A	ApKVX3np5wltK									
								Course Articul	ation Matrix								
COs PO	01	PO2	PO3	PO4	PO5	PO6 F	P07	PO8	P09	PO10	P011	PO12	PSO1		PSO2	PSO3	
CO1 3		-	2	1	1			-	1	-	2	-	1		2	2	
CO2 2		-	2	-	-			-	2	-	1	-	1		1	1	
CO3 2		-	2	1	1			-	1	-	2	-	1			1	
CO4 2		1	2	1	1			1	1	-	1	-	2		1	2	
CO5 3		-	2	2	2			-	1	1	2	-	1		1	1	
	-				-			-	-	-	-	-	-		-	-	



		-	-														
	Title of the	Course	Regulato	ry Attairs													-
	Course	Code	MPH 104	т													
								Part	A								
	Von		1 ct			Somester		1 ct				Crodite		L	т	P C	3
	iea		101			Semester		100				credits		4	0	0 4	,
	Course	Туре	Theory of	nly													
	Course Ca	itegory	Disciplin	e Core													
	Pre-Requ	isite/s									(	Co-Requisite/s					
	Course Ou & Bloom's	tcomes s Level	CO1- To CO2- To CO3- To CO4- To CO5- To	remember different m understand the cellul evaluate the crude dr evaluate the crude dr evaluate the crude dr	norphological and m ar structure of crude ugs by quantitative ugs by physical met ugs by chemical me	icroscopical charact drugs.(BL2-Unders evaluation methods. thods of evaluation.( ethods of evaluation.	eristic features of cri stand) .(BL5-Evaluate) (BL5-Evaluate) .(BL5-Evaluate)	ude drugs.(BL	1-Remember)								
	Coures El	ements	Skill Dev Entrepre Employa Professa Gender 3 Human \ Environn	elopment ✓ neurship X bility ✓ onal Ethics ✓ × /alues X nent X					SDG (Goals)		SDG4(Quality education)						
								Part	в								
	Mode	ıles				Cont	ents				Pe	edagogy			н	ours	
					Part B Contents Part C Part C												
Modu	les				Title			- un	0	Indicative-A Experiments Intern	BCA/PBL/ Field work/ hips			Bloom's Leve	н	Hour	rs
UNIT-III		prepare regulatory gui	delines for different	countries					Seminar				BL3-Apply			10	
Tedel M			inum Dessier Ma			Fotomal Fotologia	Pa	rt D(Marks Theo	Distribution) ry						Min Internal Fr	-1	
TOTAL M	arks		inum Passing Ma	rks		External Evaluation	n .		Min. External Eval	Jation	inte	mai Evaluation			Min. Internal Ev	aluation	
100		50			75		3	38			25			13			
-					1			Practi	cal								
Total Ma	arks	Min	imum Passing Ma	rks		External Evaluation	n		Min. External Eval	uation	Inte	rnal Evaluation			Min. Internal Ev	aluation	-
		0															
	Bool	c	1. Gener	ic Drug Product Deve	lopment, Solid Oral	Dosage forms, Leor	n Shargel and Isade	Part r Kaufer, Marc	E el Dekker series, Vol.143	3 2. The Pharmaceu	ical Regulatory Process, S	econd Edition Ec	lited by Ira R. Be	rry and Robert P.I	Martin, Drugs and t	ne Pharmaceutic	cal
			Sciences	s,voi.185, Informa Hea	aith care Publishers	. 3. New Drug Appro	wai Process: Accele	rating Global	Registrations By Richard	A Guarino, MD,5th	dition, Drugs and the Phar	maceutical Scier	nces, Vol.190				
	References	es Books	1. Guidel	gsci-ojs-tamu.tdl.org/r	egsci/ y submissions / Sar	ndy Weinberg. By Jo	hn Wiley & Sons.In	c. 2. FDA regu	latory affairs: a guide for	prescription drugs,	nedical devices, and biolog	ics/edited By Do	uglas J. Pisano,	David Mantus. 3.	Clinical Trials and I	luman Research	h: A
	MOOC C	NITSES	https://op	linecourses optel ac in	Jompliance By Fay.	A.RuZOVSKY and Ro	uney K. Adams 4. W	ww.icn.org/ 5.	www.ida.gov/ 6. europa.	eunindex_en.ntm 7.	iups.//www.tga.gov.au/tga-	DarsiCS					
	Vider	5	https://ww	w voutube com/watel	h?v=xr7l8q70Hol&li	ist=PLnGCEhhV_IS	Xub8vEn4MwInuNic	lf6hfRY									
L		-		,													
							Co	urse Articul	ation Matrix								
COs	P01	PO2	PO3	PO4	P05	P06	P07	PO8	PO9	PO10	PO11	P012	PSO1		PSO2	PSO3	
CO1	1	1	-	1	1	-	-	2	-	-	3	-	1		-	1	
CO2	2	-	-	-	2	1	-	3	-	-	3	-	2		1	2	
CO3	1	2	-	-	-	-	-	2	-	-	2	-	-		-	-	
CO4	3	2	-	1	-	2	-	3	-	-	2	-	-1		2	-	
CO5	2	1	-	-	1	1	-	1	-	-	2	-	-		2	-	
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-			-	



Title of the Course	Modern Pharmaceutical Ar	nalytical Techniques						
Course Code	MPH 101T							
			Part A					
Vera	4-4	Comparison (	4-4	Condito	L	т	Р	С
Tear	151	Semester	TSL .	Creans	4	0	0	4
Course Type	Theory only							
Course Category	Discipline Core							
Pre-Requisite/s				Co-Requisite/s				
Course Outcomes & Bloom's Level	CO1- To remember differe CO2- To understand the c CO3- To evaluate the cruc CO4- To evaluate the cruc CO5- To evaluate the cruc	nt morphological and microscopical characteristic features of cr eliular structure of crude drugs ( <b>BL2-Understand</b> ) de drugs by quantitative evaluation methods ( <b>BL3-Evaluate</b> ) de drugs by physical methods of evaluation. ( <b>BL3-Evaluate</b> ) de drugs by chemical methods of evaluation. ( <b>BL3-Evaluate</b> )	ude drugs.(BL1-Remember)					
Coures Elements	Skill Development ✓ Entrepreneurship X Employability ✓ Professsonal Ethics X Gender X Human Values X Environment X		SDG (Goals)	SDG4(Quality education)				

## Part B

Hours

Pedagogy

Contents

Modules

		F	Part D(Marks Distribution)		
			Theory		
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation
100	50	75	38	25	13
			Practical		
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation
	0				

	Part E
Books	Spectrometric Identification of Organic compounds - Robert M Silverstein, Sixth edition, John Wiley & Sons, 2004. 2 Principles of Instrumental Analysis - Doglas A Skoog, F. James Holler, Timothy A. Nieman, Sthedition, Eastern press, Bangalore, 1998. 3. Instrumental methods of analysis – Willards, 7th edition, CBS publishers. 4. Pharmaceutical Chemistry – Beckett and Stenlake, Vol II, 4th edition, CBS Publishers, New Delhi, 1997.
Articles	https://www.sciencedirect.com/journal/journal-of-pharmaceutical-analysis
References Books	1. Organic Spectroscopy - William Kemp, 3rd edition, ELBS, 1991. 2. Quantitative Analysis of Drugs in Pharmaceutical formulation - P D Sethi, 3rd Edition, CBS Publishers, New Delhi, 1997. 3. Pharmaceutical Analysis-Modern methods – Part B - J W Munson, Volume 11, Marcel Dekker Series
MOOC Courses	https://onlineccurses.nptel.ac.in/
Videos	http://www.udem.com/course/ndem-analytical=kechrisuss?utm_source=adwords- pmas&utm_medium-adwigneds_wtm_campaign=PMar_Let PL_ciRDAdAwtm_content=deatRS48.dtm_term=_agkwstdde_c_dmplii_i1007766_pd&gad_source=2&gcide=Cj0KCQjwzZmwBhD8ARbAHv1gVb5PzOTEvNr_12MuMvoz1rKhE_Qov_xOdrhwjSAvvxEBxOAy6waADsEALw_vcB&
	Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	P06	P07	PO8	PO9	PO10	P011	PO12	PSO1	PSO2	PSO3
CO1	3	1	3	-	3	-	-	-	-	-	3	-	1	-	1
CO2	3	2	3	•	2	1	-	-	-	-	3	-	2	1	2
CO3	3	1	1	-	1	2	-	-	-	-	3	-	2	-	1
CO4	3	1	1	2	2	2	-	-	-	-	3	-	1	2	2
CO5	2	1	2	-	2	2	-	-	-	-	3	-	-	1	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



[																	
	Title of the	Course	Drug Del	very System													
	Course	Code	MPH 102	1													
								Part	4								
	Yea	r	1st		Sen	nester	1st					Credits		L	T	P	C
	Course	Туре	Theory of	nly										*	0	Ů	4
	Course Ca	itegory	Disciplin	e Core													
	Pre-Requ	isite/s										Co-Requisite/s					
	Course Ou & Bloom's	tcomes i Level	CO1- To CO2- To CO3- To CO4- To CO5- To	remember different r understand the cellu evaluate the crude o evaluate the crude o evaluate the crude o	norphological and m lar structure of crude rugs by quantitative rugs by physical me rugs by chemical me	icroscopical character drugs.(BL2-Underst evaluation methods.(E thods of evaluation.(B athods of evaluation.(E	istic features of and) BL5-Evaluate) IL5-Evaluate) BL5-Evaluate)	crude drugs.(BL	I-Remember)								
	Coures El-	ements	Skill Dev Entrepre Employa Professa Gender Human <sup>1</sup> Environ	elopment ✓ neurship X bility ✓ onal Ethics X X /alues X nent X				SDG (	Goals)	SDG1(NG SDG3(G SDG4(Q SDG17(F	lo poverty) iood health and uality educatio Partnerships fo	d well-being) in) ir the goals)					
								Part	в								
	Mod	iles				Conte	nts					Per	dagogy			Но	ırs
								Part	0								
Modu	Modules Title									Indio Exper	cative-ABCA/ riments/Field Internships	PBL/ work/		Blo	om's Level		Hours
UNIT-1		3D PRINTING TECHN	IOLOGY						PBL				E	3L4-Analyze			10
							F	Part D(Marks D Theor	Distribution) Y								
Total Ma	arks	Min	imum Passing Ma	rks		External Evaluation			Min. External Eval	uation		Inter	nal Evaluation			Min. Internal Eval	uation
100		50			75			38				25		13			
								Practio	al								
Total Ma	arks	Min	imum Passing Ma	rks		External Evaluation			Min. External Eval	uation		Inter	nal Evaluation			Min. Internal Eval	uation
		0															
									_								
	Book	s	1.N.K. Ji	ain, Controlled and N	ovel Drug Deliverv. (	CBS Publishers & Dist	ributors, New D	elhi, First edition	⊏ 1997 (reprint in 2001). 2	. S. P. Vya s	s and R. K. Kha	ar, Controlled Drug Del	livery- conceptsa	nd advances, Vallabh	Prakashan. N	New Delhi, First edi	ition 2002
	Articl	es	2.Indian	Journal of Pharmace	utical Sciences (IPA)	3. Indian drugs (IDM/	A) 4. Journal of	controlled release	(Elsevier Sciences) de	sirable 4. Dr	rug Developme	ent and Industrial Phar	macy (Marcel & D	)ecker) desirable			
	References	Books	5. Y W. C	hien, Novel Drug De	livery Systems, 2nd	edition, revised and ex	xpanded, Marce	Dekker, Inc., Ne	w York, 1992. 2. Robins	on, J. R., Le	ee V. H. L, Cor	ntrolled Drug Delivery S	Systems, Marcel I	Dekker,Inc., New York	, 1992. 3. En	cyclopedia of contr	olled delivery, Editor-
	MOOC Co	ourses	https://or	linecourses.nptel ac	y www.ey interscience	r ubiidauon, John Wile	ey ariu auris, INC	, New TOTK! Chic	nester/weinneim								
	Video	5	https://w	w.youtube.com/wat	:h?v=1Jk08tf1Gh8												
L																	
-			1				(	Course Articula	tion Matrix								-
COs	PO1	PO2	PO3	PO4	P05	P06	P07	PO8	PO9	PO10		P011	P012	PSO1	P	SO2	PSO3
CO1	3	-	3	-	3	1	-	-	-	-		3	-	1	-		1
CO2	3	-	2	-	1	2	-	-	-	-		3	-	2	1		-
CO3	3	1	3	-	2	-	-	-	-	-		3	-	-	-		2
CO4	3	-	1	-	2	1	-	-	-	-		3	-	-	1		2
CO5	2	2	3	1	1	-	-	-	-	-		3	-	1	2		-
CO6	-	-	-	-	-	-	-	-	-	-		-	-	-	-		-



						Inform Disconception												
	Title of the	Course	Modern P	harmaceutics														
	Course	Code	MPH 103	г														
								Part	۵									
								i an	^				L	т	Р		С	
	Yea	r	1st		Ser	mester	1st				Credits		4	0	0		4	
	Course	Туре	Theory o	nly			1										_	
	Course Ca	itegory	Discipline	Core														
	Pre-Requ	isite/s									Co-Requisite/s							
	Course Ou & Bloom's	tcomes s Level	CO1- To CO2- To CO3- To CO4- To CO5- To	remember different understand the celle evaluate the crude evaluate the crude evaluate the crude	morphological and m ular structure of crud- drugs by quantitative drugs by physical me drugs by chemical m	nicroscopical characteris e drugs.(BL2-Understa evaluation methods.(Bl thods of evaluation.(BL ethods of evaluation.(Bl	stic features and) L5-Evaluat L5-Evaluate L5-Evaluate	s of crude drugs.(BL se) a) xe)	1-Remember)				<b>I</b>					
	Coures El	ements	Skill Dev Entrepret Employal Professa Gender > Human V Environn	elopment V eeurship X pality V paal Ethics X dent X				SDG	(Goals)	SDG1(No poverty) SDG3(Good health ar SDG4(Quality educati SDG17(Partnerships f	id well-being) on) or the goals)							
								Part	в									
	Mode	iles				Conten	its				Pe	adagogy				Hours		
								Part	с									
Modu	les				Title					Indicative-ABCA Experiments/Field Internships	/PBL/ i work/			Bloom's L	.evel		Hours	
UNIT-V		study of diffussion and	dissolution parame	ters					PBL				BL4-Analyze			10		
r								Part D(Marks	Distribution)									
-								Theo	ry		1			1				
Total Ma	arks	Min	imum Passing Mar	ks		External Evaluation			Min. External Evalu	ation	Inte	rnal Evaluation			Min. Interr	hal Evaluat	ion	
100		50			75			38			25			13				
-					- 1			Practi	cal									
Total Ma	arks	Min	imum Passing Mai	ks		External Evaluation			Min. External Evalu	ation	Inte	rnal Evaluation			Min. Interi	nal Evaluat	ion	
			1 Theory	and Practice of Ind	ustrial Pharmacy By	l achmann and l iherma	ann 2 Pharr	Part	E	eon I achmann 3 Phar	manautical Dosana for	ms: Disnerse sv	stems Vol 1-2.	By Leon Lach	mann 4 Pharma	centical Do	saria forms:	
	Book	s	Parentera	al medications Vol.	1-2; By Leon Lachma	ann. 5. Modern Pharmac	ceutics; By	Gillbert and S. Bank	er. 6. Remington's Pharm	aceutical Sciences	nadealear boolage for	nio. Disperse sy	5101115, 101, 112, 1	by Econ Eddi	indini. 4. r nama	ocultur Do.	age lonne.	
	Articl	es	https://ww	w.ijmpronline.com/														
	References	Books	7.Advanc edition; B Agra. 12. technolog	as in Pharmaceutic: y Sidney H. Willig. 1 Pharmaceutical Pro y, Vol I – III	al Sciences Vol. 1-5; 11. Quality Assurance ocess Validation; By I	By H.S. Bean & A.H. Be Guide; By Organization Fra. R. Berry and Rober	eckett. 8. Pr n of Pharma rt A. Nash. 1	hysical Pharmacy; E aceutical producers 13.Pharmaceutical F	by Alfred martin 9. Bentley of India. 12.Drug formula/ Preformulations; By J.J. W	's Textbook of Pharmace ion manual; By D.P.S. K ells. 14. Applied product	eutics – by Rawlins. 10 ohli and D.H.Shah. Ea ion and operations ma	. Good manufac stern publishers nagement; By E	turing practices f , New Delhi. 13. Vans, Anderson,	for Pharmaceu How to practic Sweeney and	uticals: Aplan for t æ GMPs; By P. P. d Williams. 15. En	otal quality Sharma. Va cyclopedia	control, Second andhana Publications, of Pharmaceutical	
	MOOC Co	ourses	https://sw	ayam.gov.in/nc_det	ails/NPTEL													
	Video	0S	https://ww	w.youtube.com/wat	tch?v=mRJvss9bMV	c&list=PL0o-kamDFTun	mhseOKF-6	OCrHdhBySNkAA										
C05	PO1	802	802	804	POS	PO6 P	207	Course Articul	ation Matrix	BO10	B011	PO12	DCO1		PSO2	1	8803	
C01	1	-	3	-	1			-	-	-	3	-	1		-		1	
CO2	3	1	1	-	2			-	-	-	3	-	-		1			
CO3	2	2	2	1	2	-		-	-	-	3	-	2		2		2	
CO4	2	1	1	-	2			-	-	-	3	-	1		-		2	
CO5	2	2	2	2		1 -		-	-	-	3	-	1		-		2	
CO6	-	-	-	-	-			-	-	-	-	-	-		-			
1	1	1	1	1	1	1		1		1	I	1			1			



Title of the Course	Pharmaceutics Practi	ical I						
Course Code	Title of the Course Code       Pharmaceutics Practical 1         Gourse Code       MPH 108P         Part A         Year       1st       Credits       C         Year       1st       Semester       1st       Credits       L       T       P       C       C         Course Type       Lab only       L       T       P       C							
			Part A					
Y	1-1	Comparing	4-1	Condito	L	т	P	с
Tear	151	Semester	151	Creats	0	0	6	6
Course Type	Lab only	•		•			•	
Course Category	Discipline Core							
Pre-Requisite/s							Co-Requisite/s	
Course Outcomes & Bloom's Level	CO1- To remember d CO2- To understand CO3- To evaluate the	different morphological and microscopical characte the cellular structure of crude drugs.( <b>BL2-Unders</b> e crude drugs by quantitative evaluation methods.)	eristic features of crude drugs.(BL1-Remember tand) (BL5-Evaluate)	r)				
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics : Gender X Human Values X Environment X	x	SDG (Goals)	SDG1(No poverty) SDG3(God health and well-being) SDG4(Quality education) SDG17(Partnerships for the goals)				

	Part	C		
Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	1. Analysis of pharmacopoeial compounds and their formulations by UV Vis spectrophotometer 2. Simultaneousestimation ofmulti component containing formulations by UV spectrophotometry	Experiments	BL4-Analyze	8
2	3. Experiments based on HPLC 4. Experiments based on Gas Chromatography	Experiments	BL3-Apply	8
3	5. Estimation of riboflavin/quinine sulphate by fluorimetry 6. Estimation of sodium/potassium by flame photometry	Experiments	BL4-Analyze	8
4	<ol> <li>To perform In-vitro dissolution profile of CR/ SR marketed formulation 8. Formulation and evaluation of sustained release matrix tablets</li> </ol>	Experiments	BL5-Evaluate	8
5	9. Formulation and evaluation osmotically controlledDDS 10. Preparation and evaluation of Floating DDS- hydro dynamically balanced DDS	Experiments	BL6-Create	8
6	11. Formulation and evaluation of Muco adhesive tablets. 12. Formulation and evaluation of trans dermal patches	Experiments	BL6-Create	8
7	13. To carry out preformulation studies of tablets. 14. To study the effect of compressional force on tablets disintegration time.	Experiments	BL3-Apply	8
8	15. To study Micromeritic properties of powders and granulation. 16. To study the effect of particle size on dissolution of a tablet	Experiments	BL3-Apply	8

Pedagogy

Hours

Contents

Modules

		F	Part D(Marks Distribution)		
			Theory		
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation
			Practical		
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation

	Part E
Books	PRACTICAL MANUAL
Articles	JOURNALS
References Books	LAB MANUAL
MOOC Courses	SWAYAM NPTEL
Videos	YOUTUBE

							Co	urse Articulation	Matrix						
COs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	3	1	1	-	-	-	-	-	3	-	1	-	1
CO2	3	1	2	2	2	-	-	-	-	-	3	-	2	1	2
CO3	3	2	3	•	1	-	-	-	-	-	3	-	3	-	2
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-		-	•	-	-	-	-	-	-	-	-	-	-	-
CO6	-		-		-	-	-	-	-	-	-	-	-	-	-



			M	Pharm-PharmaCeutics						
Title of th	e Course	Online Certificate Course								
Course	e Code	MPH 107ET								
				Part A						
Ve	25	1 et	Somostor	1-+		Cradita	L	т	Р	С
16	201	150	Sellester	156		Credits	1	0	0	1
Cours	е Туре	Online course								
Course	Category	Skill Enhancement Courses								
Pre-Rec	quisite/s	ELECTIVES				Co-Requisite/s				
Course C & Bloom	Outcomes n's Level	CO1- To remember different m	norphological and microscopical characteristic features of cr	ude drugs.(BL1-Remember)						
Coures B	Elements	Skill Development ✓ Entrepreneurship X Employability ✓ Professsonal Ethics X Gender X Human Values X Environment X		SDG (Goals)	SDG	34(Quality education)				
<u> </u>				Part B						
Mo	dules		Contents			Pedagogy			Hours	
			Pa	rt D(Marks Distribution) Theory			·			
Total Marks	Minimum Pa	assing Marks	External Evaluation	Min. External Evaluation		Internal Evaluation		Min. Interr	al Evaluation	-
50	25		25	12		25	13			
				Practical						
Total Marks	Minimum Pa	assing Marks	External Evaluation	Min. External Evaluation		Internal Evaluation		Min. Interr	al Evaluation	
	0									
				Part E						
Bo	oks	NA								
Arti	cles	NA								
Referenc	es Books	NA								
MOOC	Courses	1.https://www.coursera.org/cou	urses?query=regulatory%20affairs 2. https://www.igmpi.ac.ir	n/RAprograms.html						
Vid	eos	NA								
			Co	ourse Articulation Matrix						

COs	PO1	PO2	PO3	PO4	P05	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	-	-	-	-	3	-	-	3	-	3	1	2
CO2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	•	•	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	•	•	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	•	•	-	-	-	-	-	-	-	-	-	-	-	-



	Title of the	Course	Good Mar	nufacturing in Pharm	а											
	Course (	ode	MPH 1088	T												
								Part A								
								T ditty				L	т		P	с
	Year		1st		Semester	1	st			Credits		3	1		0	4
	Course	ype	Theory or	ly											1	+
	Course Ca	egory	Discipline	Specific Elective												
	Pre-Requ	site/s								Co-Requisite/s						
	Course Ou & Bloom's	comes Level	CO1- To r CO2- To r CO3- To r CO4- To r CO5- To r	emember different n inderstand the cellu avaluate the crude d avaluate the crude d avaluate the crude d	norphological and mice lar structure of crude d rugs by quantitative ev rugs by physical meth rugs by chemical meth	roscopical chara drugs.(BL2-Unde valuation methoo ods of evaluation nods of evaluation	cteristic features of cr erstand) is.(BL5-Evaluate) n.(BL5-Evaluate) m.(BL5-Evaluate)	rude drugs.(BL1-	Remember)							
	Coures Ele	ments	Skill Deve Entrepren Employat Professo Gender X Human V Environm	lopment ✓ ieurship X sility ✓ snal Ethics ✓ : alues X ent ✓			SDG (Go	als)	SDG1(No poverty) SDG3(Good health a SDG4(Quality educa SDG6(Clean water a SDG8(Decent work a SDG12(Responsible SDG17(Partnerships	nd well-being) ion) nd sanitation) nd economic growth) consuption and produ for the goals)	ction)					
								Part B								
	Modu	es				Co	ntents				Pe	dagogy			Ho	urs
								Bort C		1						
Modul	es				Title			Tarto		Indicative-ABC Experiments/Fie Internship	A/PBL/ Id work/ Is			Bloom's Le	vel	Hours
1		GMP						s	Seminar				BL3-Apply			2
							Pa	art D(Marks Di Theory	stribution)							
Total Ma	ırks	Mini	imum Passing Mar	ks	E	xternal Evaluati	ion		Min. External Evalu	ation	Inter	nal Evaluation			Min. Internal Eva	uation
100		0			75			38			25		1	3		
							1	Practica	d							
Total Ma	irks	Mini	imum Passing Mar	ks	E	xternal Evaluat	ion		Min. External Evalu	ation	Inter	nal Evaluation			Min. Internal Eva	uation
t					1						1					
								Dart C								
	Book	5	Karmacha	arya JB. Good manu	facturing practices (GI	MP) for medicina	al products. Promising	Pharmaceutical	s. 2014;101.							
	Article	s	Patel KT,	Chotai NP. Pharmac	eutical GMP: past, pre	esent, and future	-a review. Die Pharm	azie-An Internati	onal Journal of Pharma	ceutical Sciences. 200	8 Apr 1;63(4):251-5.					
	References	Books	Durivage I	MA, editor. The Cert	fied Pharmaceutical G	GMP Professiona	I Handbook. Quality F	Press; 2016 May	23.							
	MOOC Co	irses	UDEMY, O	OURSERA, PHAR	MASTATE ACADEMY											
	Video	5	You tube													
Course Articulation Matrix											1				1	
COs	PO1	PO2	PO3	PO4	PO5	P06	P07	PO8	P09	PO10	P011	PO12	PSO1		PSO2	PSO3
CO1	3	-	-	-	1	-	1	1	2	-	3	-	1		1	1
CO2	1	-	-	1	1	-	1	1	2	-	3	-	1		1	1
CO3	1	-	-	-	1	-	2	1	2	-	3	-	2		1	1
CO4	2	-	-	1	1	-	1	2	2	-	2	-	1		-	3
CO5	1	-	-	1	1	-	2	2	2	-	2	-	-		-	-
						-	-	-	-	-	-	-	-		-	-



							м	Pharm-Pha	maCeutics								
	Title of the	Course	Mole	cular Pharmaceutics (Na	no Tech and Target	ed DDS)											
	Course	Code	MPH	201T													
								Part	A								
	Yea	r	1st			S	emester		2nd						Credits		L T P C
	Course	Туре	Theo	ry only	- 1												
	Course Ca	itegory	Disc	pline Core													
	Pre-Requ	isite/s	Upor polyr	completion of the cour ners for the development	se student shall be a t of NTDS The form	ble to understand Th ulation and evaluation	e various approach n of novel drug deli	es for develop very systems	ment of novel drug delive	ry systems. •	The criteria f	or selection of drugs and	ł		Co-Requisite	e/s	
	Course Ou & Bloom's	tcomes s Level	CO1 CO2 CO3 CO4 CO5	To remember different To understand the cell To evaluate the crude To evaluate the crude To evaluate the crude	morphological and r lar structure of crud drugs by quantitative drugs by physical m drugs by chemical m	nicroscopical charact le drugs.(BL2-Under e evaluation methods. athods of evaluation.( lethods of evaluation.	eristic features of cr stand) (BL5-Evaluate) BL5-Evaluate) (BL5-Evaluate)	rude drugs.( <b>Bl</b>	1-Remember)								
	Coures El	ements	Skill Entrn Emp Profi Gen Hum Envi	Development ✓ preneurship X oyability ✓ isssonal Ethics X ler X an Values X onment X							SDG (Goals	)	SDG SDG	3(Good health and v 4(Quality education)	well-being) )		
								Part	в								
	Modi	lles				Cont	ents					Peda	gogy			Ног	irs
								Part	с								
Modu	ules				Title					Indica Experin I	ative-ABCA/F ments/Field Internships	PBL/ work/			Bloom's Lev	el	Hours
UNIT-2		PREPARATION OF N	ANOSOMES						PBL					BL4-Analyze			8
							Pa	art D(Marks	Distribution)								
Total M	larks	Mir	nimum Passing	Marks		External Evaluation	1	1100	Min. External Eval	uation		Interna	al Evaluation	n		Min. Internal Eval	uation
100		50			75			38				25		1:	3		
	1						1	Pract	cal			1					
Total M	larks	Mir	nimum Passing	Marks		External Evaluation	n		Min. External Eval	uation		Interna	al Evaluation	n		Min. Internal Eval	uation
		0															
								Part	E								
	Book	s	Y W. and	Chien, Novel Drug Deli Novel Drug Delivery, CB	very Systems, 2nd e S Publishers & Distr	dition, revised and ex ibutors, New Delhi, F	panded, Marcel De irst edition 1997 (re	ekker, Inc., Nev eprint in 2001).	/ York, 1992. 2. S. P. Vya	s and R. K. Ki	ihar, Controlle	ed Drug Delivery - conce	pts and adva	ances, Vallabh Praka	ashan, New D	elhi, First edition 2002	N.K. Jain, Controlled
	Articl	es	https	//pubs.acs.org/journal/n	ipohbp				V 1 4000 0 0 0 0 V	10 10 10		10 0 1				N	
	References	Books	Y W. Nove	Cnien, Novel Drug Deliv I Drug Delivery, CBS Pu	ery Systems, 2nd e blishers & Distributo	ontion, revised and ex rs, New Delhi, First e	panded, Marcel De dition 1997 (reprint	ккег, Inc., Nev in 2001).	топк, 1992. 2. S. P. Vya	s and R. K. Kh	nar, Controlle	a Drug Delivery - concep	pts and adva	inces, Vallabh Praka	asnan, New De	eini, ⊢irst edition 2002.	N.K. Jain, Controlled a
	MOOC Co	ourses	https	//onlinecourses.nptel.ac	.in/												
	Video	95	https	//www.youtube.com/wa	ch?v=rGP7KZOTkz	E											
							0	ouroo Artioul	ation Matrix								
COs	PO1	PO2	PO3	PO4	PO5	P06	P07	PO8	PO9	PO10	1	P011 I	PO12	PSO1		PSO2	PSO3
CO1	3	1	3	3	3	-	-	-	-	-		3 -		3		-	3
CO2	2	2	2	3	2	-	-	-	-	-		3 -		2		1	2
CO3	2	1	3	2	1	-	-	-	-	-		3 .		2		-	1
CO4	3	2	3	2	3	-	-	-	-	-		3 -	-	3		2	2
CO5	1	1	3	2	2	-	-	-	-	-		2		2		2	3
CO6	-	-	-	-		-	-	-	-	-				-		-	-



									MPharm-P	harmaCeut	ics							
	Title of the	Course		Advanced	Biopharmaceutics	& Pharmacokinetics												
	Course	Code		MPH 202T	r													
									P	Part A								
	Ve	_		4-4		<b>6</b> -1		2-					Canadita		L	т	Ρ	с
	164	r		151		361	nester	20	iu .				Credits		4	0	0	4
	Course	Туре		Theory on	aly													
	Course C	ategory		Discipline	Core													
	Pre-Requ	isite/s											Co-Requisit	e/s				
	Course Ou & Bloom	tcomes s Level		CO1- To ro CO2- To u CO3- To e CO4- To e CO5- To e	emember different understand the cell avaluate the crude avaluate the crude avaluate the crude	morphological and n ular structure of crud drugs by quantitative drugs by physical me drugs by chemical m	hicroscopical charact e drugs. (BL2-Under evaluation methods. thods of evaluation. ( ethods of evaluation.	eristic feature stand) (BL5-Evalua BL5-Evaluat (BL5-Evalua	es of crude drugs. ate) ate) ate)	.(BL1-Remen	nber)							
	Coures E	ements		Skill Deve Entrepren Employab Professso Gender X Human Va Environme	elopment √ ieurship × iility √ nal Ethics × alues × ent ×				S	DG (Goals)		SDG3(Good health SDG4(Quality educ	and well-being) ation)					
									Р	Part B								
	Mod	ules					Cont	ents						Pedagogy			Hou	rs
									Р	Part C	-				1			
	Modules					Title	Ð					Indic Exper	ative-ABCA/PBL/ ments/Field work Internships	d		Bloom's Level		Hours
EXPERIMENT			PREPARATIO	ONS OF TARGE	TED DRUG DELIE	VERY SYSTEM					PBL				BL3-Apply			10
									Part D(Mar T	rks Distributi 'heory	on)							
Total Ma	arks		Minimu	m Passing Marl	ks		External Evaluation	ı		Min.	External Evalua	ition		Internal Evaluation		Mir	n. Internal Eval	uation
100		50				75			38				25		13			
									Pr	ractical								
Total Ma	arks		Minimu	m Passing Mark	ks		External Evaluation	ı		Min.	External Evalua	ition		Internal Evaluation		Mir	n. Internal Eval	uation
		0																
	Boo	s		1. Biophar edition, Dr pharmace expande b Pharmace Developm	rmaceutics and Cli rug Intelligence Pu Jutical press, RPS I by Robert. E. Notan autical Technology, sent- Solubility, Per	nical Pharmacokineti Dications, Hamilton, Publishing,2009. 13. i, Marcel Dekker Inc, Vol 13, James Swarl meability, and Charg	cs, An Introduction, 4 Illinois, 1971. 3. Ency Absorption and Drug New York and Base orick, James. G. Boyl e State, Alex Avdeef,	th edition, re vclopedia of f Developmer I, 1987. 10. Bi an, Marcel D John Wiley &	P wised and expand Pharmaceutical Tr nt- Solubility, Perm iopharmaceutics Jekker Inc, New Y & Sons, Inc, 2003.	Part E de by Robert. fechnology, Vo meability, and and Relevant fork, 1996. 12.	E. Notari, Marce I 13, James Swa Charge State, Al Pharmacokinetic Basic Pharmac	Dekker Inc, New Yo rbrick, James. G. Bo ex Avdeef, John Wile s by John. G Wagne okinetics, 1st edition,	rk and Basel,1987 ylan, Marcel Dekk y & Sons, Inc,200; r and M.Pemarows Sunil S Jambheka	2. Biopharmaceutics and F ar Inc, New York, 1996. 12. 3. 9. Biopharmaceutics and ski, 1st edition, Drug Intellige r and Philip J Breen, pharm	Relevant Pharmaccki Basic Pharmacokin Clinical Pharmaco ence Publications, laceutical press, Ri	okinetics by John netics, 1st editior kinetics, An Intro Hamilton, Illinois PS Publishing,20	<ol> <li>G Wagner and , Sunil S Jambi duction, 4th edit , 1971. 11. Ency 009. 13. Absorpt</li> </ol>	M.Pemarowski, 1st lekar and Philip J Breen, ion, revised and clopedia of on and Drug
	Artic	es		JOURNAL	OF PHARMACEL	TICS JOURNAL OF	MOLECULAR PHAP	RMACEUTIC	s									
		1. Biophan Biopharma Perrier, 2n Thom~ N.	maceutics and Clir aceutics and Pham id edition, Marcel D Tozer, Lea and Fe	ical Pharmacokinetic acokinetics by Shar ekker Inc.,New York biger, Philadelphia, 1	s by Milo Gibaldi, 4tl gel. Land YuABC, 2n , 1982 6. Current Cor 995 8. Dissolution, B	n edition,Phil dedition, Cor ncepts in Pha ioavailability	adelphia, Lea and nnecticut Appletor armaceutical Scie and Bioequivaler	d Febiger, 199 n Century Cro ances: Biophar nce, Abdou. H.	1 2. Biopharmac fts, 1985 4. Text maceutics, Swa M, Mack Publis	eutics and Pharmace book of Biopharmace brick. J, Leaand Feb hing Company, Penns	okinetics, A. Treatie utics and Pharmac iger, Philadelphia, sylvania 1989	se, D.M. Brahmankar and S okinetics, Dr. Shobha Rani 1970 7. Clinical Pharmacok	Sunil B. Jaiswal., V. R. Hiremath, Prisn inetics, Concepts a	allabPrakashan, n Book 5. Pharm and Applications	Pitampura, Della acokinetics by N 3rd edition by N	i 3. Applied lilo Gibaldi and D. lalcolmRowland and		
	MOOC C	ourses	-	NPTEL		-	-			-	-	-	-				-	
	Vide	05		https://www	w.youtube.com/wa	ch?v=hXmiai9ZR0												
									0		4-i							
COs	PO1	PO2	P	03	PO4	P05	P06	P07	PO8	iculation Ma	29 PC	PO10	P011	P012	PSO1	PSO:	2	PSO3
CO1	3	1	1		3	1	3	-	-	-		-	3	-	1	1		1
CO2	2	1	2		2	2	2	-	-	-		-	2	-	2	2		2
CO3	2	2	3		1	2	1	-	-	-		-	2	-	1	2		2
CO4	3	-	1		2	2	2	-	-	-		-	3	-	2	-		2
CO5	3	1	3		2	3	2	-	-	-		-	2	-	1	1		3
CO6	-	-	-		-	-	-	-	-	-		-	-	-	-	-		-



								ni ilalili-i ila	maceutica								
	Title of the	Course	Comput	er Aided Drug	Delivery System												
	Course	Code	MPH 20	)3T													
								Par	tA								
	Yea	ır	1st		Semest	er	2nd				Credits		L	Т		P	c
	Course	Туре	Theory	only									4	0		U	4
	Course C	ategory	Discipli	ne Core													
	Pre-Requ	uisite/s									Co-Requisite/s	5					
	Course Ou & Bloom	utcomes s Level	C01- T C02- T C03- T C04- T C05- T	o remember di o understand ti o evaluate the o evaluate the o evaluate the	ferent morphological and ne cellular structure of cru crude drugs by quantitati crude drugs by physical r crude drugs by chemical	microscopical chara de drugs.(BL2-Und ve evaluation method nethods of evaluatio methods of evaluatio	acteristic features of erstand) ds.(BL5-Evaluate) n.(BL5-Evaluate) on.(BL5-Evaluate)	crude drugs.(Bl	L1-Remember)								
	Coures El	ements	Skill De Entrepr Employ Profess Gender Human Enviror	evelopment eneurship X vability sonal Ethics X S Values X iment X	:		SDO	G (Goals)	SDG SDG SDG SDG	3(Good health an 4(Quality educatio 7(Affordable and 6 9(Industry Innova)	d well-being) m) clean energy) tion and Infrastruc	ture)					
								Parl	tВ								
	Mod	ules				Co	ontents					Ped	agogy			H	ours
								Part	C								
Modu	Modules Title ARTIFICIAL INTELLIGENCE IN HEALTH CARE									E	ndicative-ABCA/ xperiments/Field Internships	PBL/ work/			Bloom's	Level	Hours
1	ARTIFICIAL INTELLIGENCE IN HEALTH CARE								Seminar					BL4-Analyze			2
Total M	arks	мі	inimum Passing M	arks		External Evaluat	F	Part D(Marks Theo	Distribution) ory Min. Exte	rnal Evaluation		Interr	nal Evaluation	n		Min. Internal Ev	aluation
100		50			75			38				25			13		
								Pract	ical						1		
Total M	arks	Mi	inimum Passing M	arks		External Evaluat	ion		Min. Exte	rnal Evaluation		Interr	al Evaluation	n		Min. Internal Ev	aluation
								Part	tΕ								
	Boo	ks	1. Com Vol 13,	puter Applicatio James Swarbr	ons in Pharmaceutical Re ick, James. G. Boylan, M	search and Develop arcel Dekker Inc, Ne	ment, Sean Ekins, 2 w York, 1996.	uuo, John Wile	y & Sons. 2. Co	mputer-Aided App	ilications in Pharm	aceutical lechnology, 1	st Edition, Jel	iena Djuris, Wood	inead Publis	ning 3. Encyclopediaof P	narmaceutical lechnology,
	Artic	les	1. Com Vol 13,	puter Applicatio James Swarbri	ns in Pharmaceutical Re ck, James. G. Boylan, Ma	search and Develops arcel Dekker Inc, Net	ment, Sean Ekins, 2 w York, 1996.	006, John Wiley	/ & Sons. 2. Cor	mputer-Aided App	lications in Pharm	aceutical Technology, 1	st Edition, Jel	ena Djuris, Wood	head Publis	hing 3. Encyclopediaof Pt	narmaceutical Technology,
	Reference	s Books	1. Com Vol 13,	puter Applicatio James Swarbri	ns in Pharmaceutical Re ck, James. G. Boylan, Ma	search and Develop arcel Dekker Inc, Ne	ment, Sean Ekins, 2 w York, 1996.	006, John Wiley	/ & Sons. 2. Cor	mputer-Aided App	lications in Pharm	aceutical Technology, 1	st Edition, Jel	ena Djuris, Wood	head Publis	hing 3. Encyclopediaof Ph	narmaceutical Technology,
	MOOC C	ourses	nptel														
	Vide	05	pharma	wins													
									M-+ -								
COs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO1	0	P011	P012	PSO1		PSO2	PSO3
CO1	1	1	3	-	3		1	-	-	-		3	-	1		-	1
CO2	2	2	3	-	3	-	-	-	-	-		3		-		1	2
CO3	1	-	2	-	2	-	-	-	-	-		3	-	2		2	2
CO4	3	1	2	-	3	-	1	-	-	-		2	-	1		-	-
CO5	3	-	1	-	3	-	1	-	-	-		2	-	-		2	-
CO6	-	-	-	-	-	-	-	-	-	-		-	-	-		-	-



	Title of the	Course	Cosmetic	s and Cosmeceutica	ls												
	Course	Code	MPH 204	т													
								Part	Δ								
	Yea	r	1st		Semester		2nd	Tar			Credits		L	T		P	C 4
	Course	Туре	Theory o	nlv									*	v		0	*
	Course C	tegory	Discipline	Core													
	Pre-Reg	isito/s	Discipline	0016							Co-Requisite/s						
	Course Ou & Bloom'	tcomes s Level	CO1- To CO2- To CO3- To CO4- To CO5- To	remember different n understand the cellu evaluate the crude d evaluate the crude d evaluate the crude d	norphological and mi lar structure of crude rugs by quantitative e rugs by physical met rugs by chemical met	croscopical charac drugs.( <b>BL2-Unde</b> valuation method hods of evaluation thods of evaluation	cteristic features of e rstand) s.(BL5-Evaluate) I.(BL5-Evaluate) n.(BL5-Evaluate)	crude drugs.( <b>BL</b>	1-Remen	nber)							
	Coures El	ements	Skill Dev Entreprei Employa Professa Gender X Human \ Environn	elopment ✓ neurship X bility ✓ onal Ethics X ( alues X ient X			SDG	i (Goals)		SDG3(Good healt SDG4(Quality edu SDG9(Industry Inr	th and well-being) ucation) novation and Infrastruc	ture)					
								Part	в								
	Mod	ules				Cor	ntents	ran	0			Pe	dagogy			Но	ours
L								_									
Modu	les				Title			Part	c		Indicative-ABCA/ Experiments/Field Internships	PBL/ work/			Bloom's L	evel	Hours
UNIT-4	Modules Title COSMETIC PREPARATIONS								PBI					BI 3-Apply			12
Total Ma	arks	Mini	imum Passing Ma	ks	75	External Evaluation	P	Part D(Marks   Theo	Distribut rry Min.	ion) External Evaluati	ion	Inter 25	nal Evaluation	1	13	Min. Internal Eva	luation
100					10			Bracti	ical			20			10		
Total M	orke	Mini	mum Passing Ma	***		external Evaluation	on.	Flace	Min	External Evaluati	ion	Inter	mal Evaluation		1	Min. Internal Eve	Justion
Total Wa	11K5	^	inium rassing wa	K5			011			External Evaluation	.011	inter				min. Internal Eve	idation
	Воо	<u> </u>	Harry's C	osmeticology. 8th ed	lition. Poucher'sperfu	mecosmeticsandS	Soaps, 10th edition. 3	Part 3. Cosmetics - F	E	on, Manufacture an	nd quality control, PP.SI	harma,4th edition Hand	dbook of cosme	tic science and	Technology A.	O. Barel, M. Payeand H	J. Maibach. 3rd edition 5.
	A-41-	or.	bttps://	inglibron/wilow/	i ouppliers catalogue	. GTPA ulleciolly.											
	Reference	s Books	Harry's C Cosmetic	osmeticology. 8th ed and Toiletries recent	ition. Poucher'sperfu suppliers catalogue.	mecosmeticsandS CTFA directory.	Soaps,10th edition. (	Cosmetics - For	mulation,	Manufacture and q	quality control, PP.Shar	ma,4th edition Handbo	ook of cosmetic	science and Tec	chnology A. O.	Barel, M. Payeand H.I.	Maibach. 3rd edition
	MOOC C	ourses	https://np	tel.ac.in/													
	Videos https://www.youtube.com/watch?v=bcCkQ1liaKA																
							c	Course Articul	ation M	atrix							
COs	PO1	PO2	PO3	PO4	P05	P06	P07	PO8	Р	09	PO10	PO11	PO12	PSO1	1	PSO2	PSO3
CO1	1	-	-	-	2		-	-	-		-	3	-	1		1	1
CO2	3	1	-	-	2		-	-	-		-	3	-	2		2	2
CO3	2	2	-	-	2		-	-	-		-	1	-	1		-	2
CO4	1	2	-		1		-	-	-		-	2	-	1		-	3
CO5	3	-	-	-	-		-	-			-	1	-	-		2	2
CO6	-	-	-	-	-		-	1-	-		-	-	-	-		-	-
1	1	1		1	1		1						1			1	



Title of the Course	Pharmaceutics Practical							
Course Code	MPH 205P							
			Part A					
Yee	4-4	Composition .	2-4	Condito	L	т	Р	С
Tear	151	Semester	2110	Creans	7	0	0	7
Course Type	Lab only	•	-	•				
Course Category	Discipline Core							
Pre-Requisite/s	TO GAIN EXPERIMEM	TAL KNOWLEDGE		Co-Requisite/s				
Course Outcomes & Bloom's Level	CO1- To remember diffe CO2- To understand the CO3- To evaluate the or CO4- To evaluate the or	erent morphological and microscopical characteristic featu c cellular structure of crude drugs. (BL2-Understand) ude drugs by quantitative evaluation methods. (BL5-Evalu ude drugs by physical methods of evaluation. (BL5-Evalu	res of crude drugs.(BL1-Remember) uate) ate)					
Coures Elements	Skill Development J Entrepreneurship J Employability J Professsonal Ethics X Gender X Human Values X Environment X		SDG (Goals)	SDG3(Good health and well-being) SDG4(Quality education)				

Part B

Pedagogy

Hours

Contents

Modules

ſ

	Part	C		
Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	1. To study the effect of temperature change, non-solvent addition, incompatible polymer addition in microcapsules preparation	Experiments	BL4-Analyze	4
2	2. Preparation and evaluation of Alginate beads	PBL	BL6-Create	4
3	3. Formulation and evaluation of gelatin /albumin microspheres	PBL	BL6-Create	4
4	4. Formulation and evaluation of liposomes/niosomes	PBL	BL6-Create	4
5	5. Formulation and evaluation of spherules	PBL	BL6-Create	4
6	6. Improvement of dissolution characteristics of slightly soluble drug by Solid dispersion technique.	PBL	BL4-Analyze	4
7	7. Comparison of dissolution of two different marketed products /brands	PBL	BL5-Evaluate	4
8	8. Protein binding studies of a highly protein bound drug & poorly protein bound drug	PBL	BL4-Analyze	4

			Part D(Marks Distribution)		
			Theory		
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation
			Practical		
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation
150	75	100	50	50	25

	Part E
Books	7. Pharmaceutics- The science of dosage form design by M.E.Aulton, Churchill Livingstone, Latest edition
Articles	https://www.ipinnovative.com/journal-name/JPBS
References Books	1 Modern Pharmaceutics by Gilbert S. Banker & C.T. Rhodes, 3rd Edition 2. Remington: The Science and Practice of Pharmacy, 20th edition Pharmaceutical Science (RPS) 3. Theory and Practice of Industrial Pharmacy by Liberman & Lachman
MOOC Courses	https://nptel.ac.in/
Videos	NA

							Co	ourse Articulation	Matrix						
COs	PO1	PO2	PO3	PO4	P05	P06	P07	PO8	PO9	PO10	P011	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	3	-	1	-	1
CO2	3	•	1	1			-	-	-	-	3	-	-	1	2
CO3	2	-	2	2	-	-	-	-	-	-	3	-	2	-	3
CO4	3	-	-	1	•	•	-	-	-	-	3	-	-	-	2
CO5	-	•	-	-			-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



									MPharm	n-PharmaCe	outics								
	Title of th	e Course		Seminars															
	Course	Code		MPH 206S															
L										Part A									
	Ye	ar		1st		Sem	nester	2nd	i				Credits		L	T 0		P 7	C 7
	Course	е Туре		Lab only															_
	Course C	Category		Discipline	Core														
	Pre-Req	uisite/s											Co-Requisi	e/s					
	Course O & Bloom	utcomes I's Level		CO1- To re CO2- To u CO3- To e	emember different m nderstand the cellula valuate the crude dro	orphological and m ir structure of crude ugs by quantitative	icroscopical charact drugs.(BL2-Under evaluation methods.	eristic feature stand) .(BL5-Evalua	es of crude dru ate)	ugs.(BL1-Rem	nember)				·				
	Coures E	Elements		Skill Devel Entreprene Employabi Professsor Gender X Human Va Environme	lopment V aurship X liity V nal Ethics X lues X ent X					SDG (Goals)		SDG3(Good healt SDG4(Quality edu SDG7(Affordable	n and well-being) cation) Ind clean energy)						
										Part B									
	Mod	dules					Cont	tents						Pedagogy				Hour	5
										Part C									
Module	Modules Title											Indicative-A Experiments Intern	BCA/PBL/ Field work/ hips			Bloon	n's Level		Hours
1	1	Polymers in NDDS								Seminar	r				BL2-Unde	erstand			12
2		Gene theray								Seminar	r				BL2-Unde	erstand			10
3		PKPD studies								Researc	h Paper Presentat	ion			BL4-Anal	yze			12
4		Insilico drug designing								Simulati	on				BL3-Appl	у			8
									Part D(M	larks Distrib	oution)								
Total Ma	ırks	Mir	nimum Pa	ssing Mark	s		External Evaluation	n		м	in. External Evalu	ation		Internal Evaluati	on		Min	. Internal Evalu	ation
										Practical									
Total Ma	irks	Mir	nimum Pa	ssing Mark	s		External Evaluation	n		м	in. External Evalu	ation		Internal Evaluati	on		Min	. Internal Evalu	ation
100		50				75			38				25			13			
										Part E			1			1			
Books NA																			
	Artic	cles		NA															
	Reference	es Books		NA															
	MOOCO	Courses		NA															
	Vide	eos		NA															
									Course A	Articulation	Matrix								
COs	PO1	PO2	PO3		PO4	PO5	PO6	PO7	PO8		P09	PO10	PO11	PO12	PS	601	PSO2	2	PSO3
CO1	1	1	1-			-		-	-		-	3	3	1	1		-		3
CO2	-	2	2		-	-	-	-	-		-	3	3	2	-		-		1

L	001	1	1	17	-	-	-	-	-	-	5	5			-	5
Ī	CO2	-	2	2	-	-	-	-	-	-	3	3	2	-	-	1
Γ	CO3	2	•	1	-	-	-	-	-	-	3	3	1	2	-	2
Ī	CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Γ	CO5		•	•	-	-	-	-	-	-	-	-	-	-	-	-
Γ	CO6				-			-	-	-	-	-	-		-	-



	Title of the	e Course	Online Ce	tificate Course											
	Course	Code	MPH 2076	т											
								Part A				1	т	Р	c
	Yea	ar	1st		Semester		2nd			Credits		2	0	0	2
	Course	Type	Online co	irse								-	0	5	-
	Course C	ategory	Skill Enha	ncement Courses											
	Pre-Reg	uisite/s	Pharmace	utical background						Co-Requisit	e/s				
	Course Or & Bloom	utcomes 's Level	CO1- To r CO2- To u CO3- To e	amember different n nderstand the cellul valuate the crude d	norphological and micro ar structure of crude dri rugs by quantitative eva	oscopical charac rugs.(BL2-Unde aluation method:	teristic features of c rstand) s.(BL5-Evaluate)	ude drugs.(BL1-Ren	nember)						
	Skil Development V Entrepreneurship X Entrepreneurship X Entrepreneurship X Entrepreneurship X SDG (Goels) Gender X Human Values X Environment X									h and well-being) cation) lovation and Infrastr	ucture)				
								Part B							
	Mod	lules				Con	itents				Pe	dagogy		Hour	s
							Pa	rt D(Marks Distrit	oution)						
								Theory					1		
Total M	arks	Mir	nimum Passing Mar	(S	Ext	ternal Evaluation	on	M	in. External Evaluation	on	Inter	nal Evaluation	-	Min. Internal Evalu	ation
50		25			35			18			15		8		
								Practical					1		
TOLAT M	drks		innum Passing Mar	18	EX	ternal Evaluatio	'n	N	in. External Evaluation	on	inter	nai Evaluation		Min. Internal Evalu	ation
L		0						Part E							
	Boo	ks	NA												
L	Artic	les	NA												
	Reference	is Books	NA												
	MOOC C	ourses	1. https://i =&utm_so 12122712	pe.org/training/cour urce=adwords&utm 30479li_1007795	se/qbd 2. https://www.u _medium=udemyads&u ipd&matchtype=	udemy.com/cour utm_campaign=L =&gad_source='	se/quality-by-design _ongTail_la.EN_cc.It I&gclid=Cj0KCQjwzt	-qbd-in-pharmaceutic IDIA&utm_content=d OwBhD7ARIsAPDKn	al-development/? eal4584&utm_term= kBXWZvoPEBACFjan	ag_11844503253 hUEyfigFRV8AJSd1	7ad_618853564450_ /MY2AH1tTLjXCBcpyt7D	kwde_cdm SYX8aAsvOEALw_wcB	plti_dsa- &&couponCode=IND21F	PM 3. https://www.6sigma	uus/quality-by-design/
	Vide	105	NA												
							C	ourse Articulation	Matrix						
COs	PO1	PO2	PO3	PO4	P05 P	PO6	P07	PO8	P09 F	PO10	P011	PO12	PSO1	PSO2	PSO3

CO1	3	1	1	-	•	-	-	-	-	-	3	-	1	1	1
CO2	2	2	2	-	-	-	-	-	-	-	3	-	2	2	2
CO3	3	-	-	-	-	-	-	-	-	-	3	-	1	1	1
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5		-		-	•	-	-	-	-	-	-	-			-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	•



	Title of the	Course	Introductio	on to intellectual pro	operty rights											
	Course	Code	MPH 2088	ET												
								Part A							-	-
	Yea		1st		Semeste	r	2nd			Cr	edits	L 3	T 1		P 0	C 4
	Course	Гуре	Theory or	nly			1					1	1			
	Course Ca	tegory	Skill Enha	ancement Courses												
	Pre-Requ	site/s								Co-Re	quisite/s					
	Course Ou & Bloom's	comes Level	CO1- To r CO2- To r CO3- To r CO4- To r CO5- To r	remember different understand the cell evaluate the crude evaluate the crude evaluate the crude	morphological and m ular structure of crude drugs by quantitative drugs by physical me drugs by chemical me	icroscopical characte drugs.(BL2-Unders evaluation methods. thods of evaluation.( thods of evaluation.	eristic features of cr itand) (BL5-Evaluate) BL5-Evaluate) (BL5-Evaluate)	rude drugs.(BL1-Ren	iember)							
	Coures Ele	ments	Skill Deve Entrepren Employab Professo Gender X Human V Environm	elopment √ eeurship √ bility √ onal Ethics √ t alues √ ent X			si	DG (Goals)	SDG1( SDG3( SDG4( SDG6( SDG8( SDG1)	(No poverty) (Good health and well-bei (Quality education) (Clean water and sanitatic Decent work and econon 7(Partnerships for the goa	ng) n) is growth) Is)					
								Part B								
	Modu	les				Cont	ents				Pe	dagogy			Ho	urs
								Part C								
Modu	Modules Title									Indicative-AE Experiments/F Internsh	CA/PBL/ ield work/ ips		I	Bloom's Leve	el	Hours
1	Modules Title patent drafting and filing							Case	Study				BL3-Apply			5
							Pa	art D(Marks Distrit	ution)							
Total M:	irks	Min	imum Passing Mar	ks		External Evaluation		meory	in External E	valuation	Inter	rnal Evaluation			Min Internal Eval	uation
100	i ko	50	intain r aboing mar	NO	75			38	in External E		25		1:	3		auton
								Practical						-		
Total Ma	irks	Min	imum Passing Mar	ks		External Evaluation		M	in. External E	valuation	Inte	rnal Evaluation			Min. Internal Eval	uation
			-													
								Dort E								
	Book	5	Cockburn	IM. Intellectual pro	perty rights and phar	maceuticals: challen	ges and opportuniti	ies for economic rese	arch. The ecor	nomics of intellectual prop	erty. 2009 Jan:150.					
	Articl	s	Savale Sk	K, Savale VK. Intelle	ectual property rights	(IPR). World J Pharr	n Pharm Sci. 2016	Apr 22;5:2559-92.								
	References	Books	Prabu SL,	Tnk S, editors. Inte	ellectual property righ	s. BoD-Books on D	emand; 2017 Jun 2	21.								
	MOOC Co	urses	NEPTEL													
	Videos NA															
-																
	COs PO1 PO2 PO3 PO4 PO5 PO6							ourse Articulation	Matrix			1				[
COs	P01	P02	P03	P04	P05	PU6	P07	2	PO9	PO10	P011	PO12	PSO1		PSO2	PSO3
001		-		-	-	-	-	2	-	2	2	F	1			1
C02		1		-	-	-	-	2	-	-	4	F	-		-	
CO4		-		[			-	2	-	-	2					
C05		-			1.		-	1.	-	- <u>.</u>	1					1.
CO6	-	-		-	-	-	-	-	-	-	-	-	-		-	-
	1		1	1	1	1		1		1	1	1	1		1	



Title of the Course	Research Methodology a	nd Biostatistics											
Course Code	MPH 301T												
			Part A										
Yee	2-4	Comparing 1		Condito	L	т	Р	с					
Year	2nd	Semester	ara	Creaits	4	0	0	4					
Course Type	Theory only												
Course Category	Discipline Core	•											
Pre-Requisite/s		Co-Requisito/s											
Course Outcomes & Bloom's Level	CO1- To remember differ CO2- To understand the CO3- To evaluate the cru CO4- To evaluate the cru	rent morphological and microscopical characteristic fe cellular structure of crude drugs, (BL2-Understand) de drugs by quanitative evaluation methods, (BL5- ude drugs by physical methods of evaluation.(BL5-Eva	atures of crude drugs.(BL1-Remember) aluate) aluate)										
Coures Elements	Skill Development ✓ Entrepreneurship X Employability ✓ Professsonal Ethics X Gender X Human Values X Environment X		SDG (Goals)	SDG3(Good health and well-being) SDG4(Quality education)									

Part B

Contents

Modules

## Part D(Marks Distribution)

Pedagogy

Hours

	Theory													
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation									
100	50	75	37	25	12									
			Practical											
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation									
	0													

	Part E
Books	1. Pharmaceutical statistics - Practical and clinical applications, Sanford Bolton, publisher Marcel Dekker Inc. NewYork 2. Fundamental of Statistics - Himalaya Publishing House- S.C. Guptha
Articles	NA
References Books	1. Design and Analysis of Experiments – PHI Learning Private Limited, R. Pannerselvam. 2. Design and Analysis of Experiments – Wiley Students Edition, Douglas and C. Montgomery
MOOC Courses	https://www.coursera.org/search?query=biostatistics%20im%20public%20health
Videos	https://www.youtube.com/watch?r=UtixXLO7c9A

	Course Articulation Matrix														
COs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	3	3	3	-		-	-	-	-	3	-	1	1	1
CO2	-	2	2	1	-	-	-	-	-	-	3	-	2	2	2
CO3	-	3	1	2	-		-	-	-	-	2	-	1	2	1
CO4	-	3	3	3	-	-	-	-	-	-	2	-	2	-	2
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



								MPharm-Ph	armaCeutics									
	Title of th	e Course	Jou	rmal Club														
	Course	Code	MF	H 302P														
								Pa	rtA									
	Yo.	<b></b>	20	4		Somostor	2rd					Cradita		L	т	Ρ		с
	Te	ai	20	-		Semester	510					Credits		0	0	1		1
	Course	е Туре	La	b only														
	Course (	Category	Dis	cipline Core														
	Pre-Req	uisite/s										Co-Requisite/s						
	Course 0 & Bloom	utcomes I's Level	cc	<ol> <li>To remember diffe</li> <li>To understand the</li> </ol>	ent morphological an cellular structure of c	d microscopical charac ude drugs.(BL2-Under	teristic features rstand)	of crude drugs.(I	3L1-Remember)									
	Coures E	Elements	Sk En Pri Ge Hu En	III Development ✓ trepreneurship X uployability X ofesssonal Ethics X nder X man Values X vironment X				SE	IG (Goals)	SDG4(Q SDG17(F	Quality education Partnerships for	on) or the goals)						
								Pa	rt B									
	Mo	dules				Con	tents					Per	dagogy				Hours	
-							rt C											
Modul	es				Title					Indicative-ABCA/PBL/ Experiments/Field work/ Internships				Bloom's	Level		Hours	
1		To understand the rece	ent literature in	Pharmaceutical scien	es				Research Paper Presenta	ntation BL3-Apply 12								
2		To prepare review artic	les						Case Study	BL5-Evaluate 5								
3		To present review artic	les						Research Paper Presenta	tion				BL3-Apply			2	
								Part D(Mark	s Distribution)									
		1						Th	eory			1						
Total Ma	arks	м	inimum Passir	ng Marks		External Evaluatio	n		Min. External Evalu	ation		Inter	nal Evaluation			Min. Inter	nal Evaluati	on
		Į.						Pra	ctical			Į.						
Total Ma	arks	м	inimum Passir	ng Marks		External Evaluatio	'n		Min. External Evalu	ation		Inter	nal Evaluation			Min. Inter	nal Evaluati	on
25		13			25			12				0			0			
								Pa	rt E									
	Boo	oks	NA	i i														
	Arti	cles																
	Reference	es Books	NA															
	MOOC	Courses	NA															
	Vid	805	NA	NA														
								Course Artic	ulation Matrix									
COs	PO1	PO2	PO3	PO4	PO5	P06	PO7	PO8	PO9	PO10		P011	PO12	PSO1		PSO2	F	°SO3
CO1	1	1	-	1	-	-	-	-	-	-		3	-	1		2	3	1
CO2	1	2	-	2	-	-	-	-	-	-		3	-	-		3	1	
CO3	-	-	· · · · · · · · ·						-	-		-	-	-		-		
CO4	-	-	-	· · · · · · · · ·						-		-	-	-		-		
CO5	-	-	-	-	-	-	-	-	-	-		-	-	-		-		
CO6	-	-	-	-	-	-		-	-	-		-	-					



Title of the Course	Discussion Presentation (F	Proposal Presentation)						
Course Code	MPH 303P							
			Part A					
Your	and	Somester	and	Cradita	L	т	Ρ	С
i cai	210	Sellester	30	Credits	0	0	2	2
Course Type	Lab only							
Course Category	Projects and Internship							
Pre-Requisite/s	Selection and discussion of	of project proposal		Co-Requisite/s				
Course Outcomes & Bloom's Level	CO1- To remember differe CO2- To understand the co CO3- To evaluate the crud	nt morphological and microscopical characteristic feature ellular structure of crude drugs.( <b>BL2-Understand</b> ) le drugs by quantitative evaluation methods.( <b>BL5-Evalu</b>	es of crude drugs.(BL1-Remember) ate)					
Coures Elements	Skill Development ✓ Entrepreneurship X Employability X Professsonal Ethics X Gender X Human Values X Environment X		SDG (Goals)	SDG3(Good Health and well-being) SDG4(Quelling education) SDG17(Partnerships for the goals)				
			Part B					
Modules		Contents		Pedagogy			Hours	
			B-# 0					

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	General Research Methodology: Research, objective, requirements, practical difficulties, review of literature, study design, types of studies, strategies to eliminate errors/bias, controls, randomization, crossover design, placebo, blinding techniques	Research Paper Presentation	BL3-Apply	12

		F	Part D(Marks Distribution)										
			Theory										
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation								
	Practical												
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation								
Total Marks	Minimum Passing Marks 25	External Evaluation 50	Min. External Evaluation 25	Internal Evaluation 0	Min. Internal Evaluation								

								Part E							
	Books		NA												
	Articles		NA												
	References B	ooks	NA												
	MOOC Cour	ses	NA												
	Videos		NA												
							C	ourse Articulation	Matrix						
000	PO1	PO2	PO2	PO4	POS	POG	PO7	PO9	PO0	PO10	PO11	BO12	PSO1	PSO2	PSO2

005		1.02		1.04					. 05	1010	1011	1012		1 002	
CO1	3	1	2	2	-	•	-	-	-	-	3	-	1	2	2
CO2	3	1	1	1	-	-	-	-	-	-	3	-	2	2	1
CO3	1	2	2	3	-	•	-	-	-	-	2	-	1	1	1
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	•	-	•	-	•	-	-	-	-	-	-	-	-	
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Title of th	e Course	Research Work								
Cours	Code	MPH 304P								
		г		Part A					-	
Ye	ar	2nd	Semester	3rd		Credits	L	Т	Р	C
							0	0	14	14
Cours	е Туре	Lab only								
Course	Category	Projects and Internship					-			
Pre-Rec	juisite/s					Co-Requisite/s				
Course C & Bloon	)utcomes I's Level	CO1- To remember different me CO2- To understand the cellula CO3- To evaluate the crude dru	orphological and microscopical characteristic features of r structure of crude drugs.(BL2-Understand) ugs by quantitative evaluation methods.(BL5-Evaluate)	i crude drugs.(BL1-Remember)						
Coures	Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✓ Gender × Human Values ✓ Environment ×		SDG (Goals)	SDG4(Qu	ality education)				
				Part B						
Mo	dules		Contents			Pedagogy			Hours	
				Part D(Marks Distribution)						
				Theory						
Total Marks	Minimum Pi	assing Marks	External Evaluation	Min. External Evaluation		Internal Evaluation	Min. Internal Evaluation			1
	175									
	·		÷	Practical						
Total Marks	Minimum Pi	assing Marks	External Evaluation	Min. External Evaluation		Internal Evaluation		Min. Inte	ernal Evaluation	
350	175		200	100		150	75			
				Part E						
Во	oks	NA								
Arti	cles	NA								
Referenc	es Books	NA								
MOOC	Courses	NA								
Vid	eos	NA								

	Course Articulation Matrix														
COs	P01	PO2	P03	PO4	PO5	PO6	P07	P08	PO9	PO10	P011	P012	PSO1	PSO2	PSO3
CO1	3	3	3	3	2	2	-	-	-	-	3	-	1	3	3
CO2	3	2	3	2	2	1	-	-	-	-	3	-	2	1	3
CO3	3	3	3	2	2	1	-	-	-	-	3	-	3	1	3
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



	Title of th	e Course	Research Presentation in Semi	nar/ Conference/Symposium												
	Course	Code	MPH 305P													
						Part A										
				ē				<b>0</b>		L	т	Р	С			
	16	dr	210	Semester		310		Credits		0	0	2	2			
	Cours	е Туре	Lab only													
	Course (	Category	Projects and Internship													
	Pre-Rec	uisite/s	know about preparation of pres	sentation	Co-Requisite/s											
	Course C & Bloom	lutcomes 's Level	CO1- To remember different m CO2- To understand the cellula	orphological and microscopical characterist ar structure of crude drugs.(BL2-Understan	tic features of cru nd)	de drugs.(BL1-Remember)										
	Coures E	lements	Skill Development ✓ Entrepreneurship × Employability × Professonal Ethics × Gender × Human Values × Environment ×			SDG (Goals)	s	DG4(Quality education)								
	Мо	dules		Contents	s			Pedagogy				Hours				
					Par	t D(Marks Distribution) Theory										
Total Ma	ırks	Minimum Pa	ssing Marks	External Evaluation		Min. External Evaluatio	on	Internal Evaluation			Min. Internal E	Evaluation				
						Practical										
Total Ma	ırks	Minimum Pa	ssing Marks	External Evaluation		Min. External Evaluatio	on	Internal Evaluation			Min. Internal E	Evaluation				
50		25		50	25	5		0		0						
			Dari F													
	Bo	oks	NA													
	Arti	cles	NA													
	Referenc	es Books	NA													
	MOOC	Courses	NA													
	Vid	BOS	NA													
					Col	urse Articulation Matrix										
			1					Teers Teers								

COs	PO1	PO2	PO3	PO4	P05	PO6	P07	P08	PO9	PO10	PO11	P012	PSO1	PSO2	PSO3
CO1	1	-	-	-	-	-	-	-	-	3	3	3	1	2	3
CO2	1	1	1	•	-	-	-	-	-	3	3	3	2	2	2
CO3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	•	-	•	-	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	•	-	•	-	-	-	-	-	-	-	-	-	-	-



							М	Pharm-Pha	maCeutics								
	Title of the	Course	Journ	al Club													
	Course (	Code	MPH	401P													
								Part	A								
	Year		2nd				Semester		4th						Ci	redits	L T P C
	Course	Гуре	Lab o	only									1				
	Course Ca	tegory	Proje	cts and Internship													
	Pre-Requ	site/s	In a je artick pharr	ournal club, a group of p es and the appropriatene macy, these clubs allow	articipants who hav ess of the study des pharmacists to unde	e common practice sign, the data analysi erstand the current d	or research interests is, the conclusions di rug research to help	meet regularly rawn, and the p make evidence	r for a defined ped ootential applicatio e-based recomme	agogical purpose. Ins or implications Indations. The goa	The club often of the research ils of journal clu	discusses current res n to practice and patie ubs in education and r	earch nt care. In esearch.		Co-Re	equisite/s	
	Course Ou & Bloom's	comes Level	CO1- CO2-	To remember different i To understand the cellu	norphological and r lar structure of cruc	microscopical charac de drugs.(BL2-Unde	teristic features of cr rstand)	rude drugs. <b>(BL</b>	1-Remember)								
	Coures Elé	ments	Skill I Entre Empl Profe Gend Huma Envir	Development ✓ preneurship X oyability X sssonal Ethics X ker X an Values X onment X							SDG (G	oals)		SDG4(Quality edu	ication)		
								Part	В						1		
	Modu	les		Contents Pedagogy													urs
-					Part C												
Modu	les			Indicative-ABC/APBL/ Title Experiment/Field work/ Bloom's Level H Internships 4													Hours
1		To understand the rec	ent literature in F	Pharmaceutical sciences					Internships					BL3-Apply			8
							Pa	art D(Marks   Theo	Distribution)								
Total Ma	arks	Mir	nimum Passing	Marks		External Evaluation	on		Min. Externa	I Evaluation		Inter	nal Evaluatio	n		Min. Internal Eva	luation
-								Deset									
Total M	arks	Mir	imum Passing	Marks		External Evaluation	20	Pracu	Min Externa	I Evaluation		Inter	nal Evaluatio	n		Min Internal Eva	Justion
25	and .	12	initian r usonig	marno	25	External Evaluation	,	13	IIII. Externe			0			0		
		-										-			-		
								Part	E								
	Book	S	NA														
	Article	95	NA														
	References	Books	NA														
	MOOC Co	urses	NA														
	Video	5	NA														
							Co	ourse Articul	ation Matrix								
COs	PO1	PO2	PO3	PO4	P05	P06	P07	PO8	PO9	PO10		P011	PO12	PSO1		PSO2	PSO3
CO1	1	1	-	-	-	-	-	-	-	-		3	-	1		-	3
CO2	3	-	1	-	-	-	-	-	-	-	-	3	-	-	-	-	1
CO3	-	-	-	-	-	-	-	-	-	-		-	-	-		-	-
CO4	-	-	-	-	-	-	-	-	-	-		-	-	-		-	-
CO5	-	-	-	-	-	-	-	-	-	-		-	-	-		-	-
CO6	-	-	-	-	-	-	-	-	-	-		-	-	-		-	-



Title of the Course	Discussion/Presentation (Prop	sion/Presentation (Proposal Presentation) 402P													
Course Code	MPH 402P														
			Part A												
Y	0-4	Secondary 1	415-		Crastita	L	т	Р	С						
tear	210	Semester	401		Credits	0	0	4	4						
Course Type	Lab only														
Course Category	Projects and Internship	s and internatio													
Pre-Requisite/s	Selection and Discussion of p	ection and Discussion of project proposal Co-Requisite/s													
Course Outcomes & Bloom's Level	CO1- To remember different n CO2- To understand the cellui CO3- To evaluate the crude d	norphological and microscopical characteristic features of crude lar structure of crude drugs.( <b>BL2-Understand</b> ) rugs by quantitative evaluation methods.( <b>BL5-Evaluate</b> )	drugs.(BL1-Remember)												
Coures Elements	Skil Development J Entreprenuership X Employability X Professional Ethics X Gender X Human Values X Environment X														
			Part B						-						
Modules		Contents			Pedagogy		Ho	urs							

		F	Part D(Marks Distribution)												
	Theory														
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation										
			Practical												
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation										
75	38	75	38	0	0										

	Part E
Books	NA
Articles	NA
References Books	NA
MOOC Courses	NA
Videos	NA

	Course Articulation Matrix														
COs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	3	-	-	-	-	-	-	3	-	1	-	2
CO2	3	3	1	3	-	-	-	-	-	-	3	-	2	-	1
CO3	3	3	2	2	-	-	-	-	-	-	2	-	2	2	2
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	-	•	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Title of th	ne Course	Discussion/Final Presentation	scussionFinal Presentation 2H 403P													
Cours	e Code	MPH 403P														
					Part A											
v		and		Somostor	415		Cradita	L	т	F	2	с				
	201	210		Semester	401		Ciedita	0	0	3	3	3				
Cours	е Туре	Lab only														
Course	Category	Projects and Internship														
Pre-Rec	quisite/s	Co-Requisite/s														
Course C & Bloon	Dutcomes n's Level	CO1- To remember different morpho CO2- To understand the cellular stru CO3- To evaluate the crude drugs by	201 - To remember different morphological and microscopical characteristic features of crude drugs.(BL1.Remember) 2020 - To understand the collular structure of crude drugs.(BL2.Londerstand) 2033 - To evaluate the crude drugs by quantitative evaluation methods.(BL5.Evaluate)													
Coures I	Elements	Skill Development ✓ Entrepreneurship × Employability × Professsonal Ethics × Gender × Human Values × Environment ×			SDG (Goals)	SD	IG4(Quality education)									
					Part B											
Мо	dules			Contents			Pedagogy			Но	Jrs					
		Part D(Marks Distribution)														
	T				Theory		1	1								
Total Marks	Minimum Pa	ssing Marks	External I	Evaluation	Min. External Evaluation		Internal Evaluation		Min. In	ternal Eval	uation					
	200															
					Practical											
Total Marks	Minimum De	anima Manka	Extornal	Evaluation	Min External Evaluation		Internal Evaluation	1	Min. In	teres I Fred						

	Part E
Books	NA
Articles	NA
References Books	NA
MOOC Courses	NA
Videos	NA

	Course Articulation Matrix														
COs	PO1	PO2	PO3	PO4	PO5	P06	PO7	P08	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	3	3	3	1	-	-	-	-	-	3	-	1	-	3
CO2	-	2	3	3	1	-	-	-	-	-	3	-	-	-	1
CO3	-	3	3	3	-	-	-	-	-	-	2	-	1	-	3
CO4	-	-	•	-	•	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	•	-	•	-	-	-	-	-	-	-	-	-	-



								WIFIIaIII	II-Filai IIIaGe	utics							
	Title of the C	ourse	Research	Publication /Report													
	Course Co	ode	MPH 404	т													
									Part A								
	Year		2nd				Semest	er	4th					Credits		L T	P C
	Course Ty	/pe															
	Course Cate	egory															
	Pre-Requis	ite/s		Co-Req	uisite/s												
	Course Outc & Bloom's L	omes _evel															
	Coures Elen	nents								SDG (G	oals)						
				Part B													
	Module	95		Contents Pedagogy Hours													
								Part D(N	Marks Distrib	ution)							
					1				Theory				T				
Total Ma	arks	Mini	imum Passing Mar	ks		External Evalu	ation		Mi	n. External Evalu	ation		Inter	nal Evaluation		Min. Internal Evalu	ation
									Practical				1				
Total Ma	arks	Mini	imum Passing Mar	ks		External Evalu	ation		Mi	n. External Evalu	ation		Inter	nal Evaluation		Min. Internal Evalu	ation
									Part E								
									Books								
									Articles								
	References Books																
	MOOC Courses																
									Videos								
	201	200	800	201	Dor	200	0.07	Course /	Articulation I	Matrix	0040		2011	2010	2004	0000	0000
COs	PO1	PO2	PO3	PO4	P05	PO6	P07	PO8	3	PO9	PO10		P011	P012	PSO1	PSO2	PSO3