Supporting Documents-1.1.3

Department of Chemical Sciences

Mapping of Courses to Employability/ Skill Development



1.1.3 & 1.2.1

Supporting Documents- Department of Chemical Science

Mapping of courses to employability/skill development



Name of the Department: Chemical Sciences Programme: M.Sc. Chemistry

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Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Tarresses and Wante Co. 84
CO1: Solve structural problems based on UV-Vis, IR, 1H-NMR, 13C-	5	S. Maryana	A Park Inch					rocas on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
NMR and mass spectral data.	V	V	V	V	V		Evaluation	Yes	
CO 2: Elucidate the structures of various organic compounds on		7. 0.7 4 1.5.5		7 2 3 3 3 3 3	7 000 000	STATE OF THE PARTY NAMED IN	Applying	Tes	Mid semester tests, End Term Exams
the basis of spectral data.	٧	V	V	V	V	V	Applying	Yes	Mid semester tests, End Term Exams
CO 3: Understand various involved processes responsible for NMR							Understanding		Mosemeter (ed.), the remit Exams
chemical shifts and splitting patterns and mass spectrometry.	٧	V	٧	V	V	V		Yes	Mid semester tests, End Term Exams
CO 4: Illustrate the mechanisms that give rise to the infrared and UV-Visible absorption bands and identify to which functional groups each correspond.	,								ivila semester tests, End Term Exams
CO 5:	V	V	V	V	V		Evaluation	Yes	Mid semester tests, End Term Exams
<i>O</i> 3.	16.18.18.				1			Yes	Mid semester tests, End Term Exams

Paper CHP407-18 Inorganic Chemistry Lab

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Total Control of the Cont
CO1: Preparation of different inorganic complexes.	V	1/	N.	1	-1				Assessment Tools to Measure Attainment of CC
CO 2: Purification and crystallisation of inorganic compounds.			- V	V	V		Understanding	Yes	Mid semester tests, End Term Exams
co 2. Furnication and crystalisation of morganic compounds.	V	V	٧	V	٧	٧	Applying	Yes	Mid semester tests, End Term Exams
CO 3: Interpretation of compounds using UV-Vis, FT-IR techniques	V	V	V	V	V	V	Evaluation	Yes	
CO 4: Measurement of various physical properties such as	4000	100	7 (0.00)			100	Litaladdoll	les	Mid semester tests, End Term Exams
magnetic moment of complexes.	V	V	V	V	V	V	Evaluation	Yes	
CO 5: Gravimetric analysis of various cations.	1/	N	11	1,1	1.1	Name and Address of the Owner, where			Mid semester tests, End Term Exams
TO ST GRAVITIE GRAVITS OF VALIDUS CAGOIIS.	V	V	V	V	V		Applying	Yes	Mid semester tests. End Term Exams

aper CHP408-18 Organic Chemistry Lab

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	
CO1: Apply various methods techniques in organic synthesis to	Great A		0.000					. asso on comprogrammy / Entirepreneursing	Assessment Tools to Measure Attainment of CO
build organic molecules.	V	V	V	V	V	V	Applying	Yes	
CO 2: Understand the fundamental mechanistic pathways of		2 (2)	1900				Libbiling	Tes	Mid semester tests, End Term Exams
organic synthesis involving various practical lab techniques									
ogether.	V	V	V	V			Understanding	Yes	
O 3: Apply the spectroscopic techniques for the determination of							Onderstanding	res	Mid semester tests, End Term Exams
molecular structures of organic molecules.	V	V	V	V	V		Applying	Vac	
O 4: Present their work with practical skills and the awareness of	Plax AS	A STATE OF				100000	Applying	res	Mid semester tests, End Term Exams
ealth and safety procedures.	٧	V	V	V	V	V	Applying	Yes	Mid semester tests, End Term Exams

Paper CHL414-18 Spectroscopy-II

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	1
CO1: Learn the fundamental and advanced concepts of	2000			and the same			ESCHOOL STATE	Trace on Employability / Embeptementaling	Assessment Tools to Measure Attainment of CC
Microwave, Infrared Vibration-rotation Raman and infra-red									
Spectroscopy and their applications for			To the						
chemical analysis	V	V	V	V	V		Understanding	Yes	
CO 2: Understand Electronic spectroscopy of different elements	100000	100000		Contract of			Officerstanding	res	Mid semester tests, End Term Exams
and simple molecules.	V	V	V	V	V		Understanding	Yes	
CO 3: Study the concepts and principles of Mössbauer			The same		100000	C DUCKSON	Onderstanding	Tes	Mid semester tests, End Term Exams
Spectroscopy and its application.	٧	V	V	V	V	V	Understanding	V	
CO 4: Apply Nuclear Quadruple Resonance and Electron Spin	VISTOR A	9 55 50 50	1000				Oriderstanding	Yes	Mid semester tests, End Term Exams
Resonance Spectroscopy for organic compounds analysis.	V	V	V	V	V	V	Applying		
CO 5: Solve structural problems based on these techniques.	v/	1	1	1,1	1.1	1.		Yes	Mid semester tests, End Term Exams
provide an area on these teerminates.		14	l v	IV.	IV.	V	Evaluation	Yes	Mid semester tests, End Term Exams

Paper CHL416P-18 Physical Chemistry Lab

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
O1: Understand the basic procedures for carrying out a physical									
emistry practical like preparation and standardisation of							Understanding.		
plutions, handling the equipments and measuring with precision.	٧	V	V	0.000	V	V	Apply	Yes	Mid semester tests, End Term Exams
2: Correlate the theoretical and practical aspects and know	9.00			1000	· Birth		Understanding,	1.49	ivila semester tests, and Term Exams
pout the limits of the experimental error.	V	٧	V		V	V	Apply	Yes	Mid semester tests, End Term Exams

CO 3: Determine the various physical parameters for the various		74000			1000000			
problems under study.	V	V	V	V	V	Evaluate	Vac	Mid
CO 4: Verify various laws studied in the theory part.	1	1.1	1.1	1.	100 200 2		163	Mid semester tests, End Term Exams
yo at verny various laws studied in the theory part.	I v	IV	IV	V	V	Analyse	Yes	Mid semester tests, End Term Exams

Paper CHP417P-18 Advanced Chemistry Lab-l

Course Outcome	PO 1	POZ	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Preparation of different inorganic complexes.	V	V	V	V	THE REAL PROPERTY.	V	Understanding	Vac	
CO 2: Purification and crystallisation of inorganic compounds.	1.	1	1.	1	CONTRACTOR OF THE PARTY OF THE		-	tes	Mid semester tests, End Term Exams
co z. Furnication and crystallisation of morganic compounds.	V	V	V	V		٧	Applying	Yes	Mid semester tests, End Term Exams
CO 3: Interpretation of compounds using UV-Vis, FT-IR techniques.	V	V	V	V	V	V	Evaluation	Yes	Mid competer tacks Ford Town France
CO 4: Measurement of various physical properties such as	916	6 186 5						163	Mid semester tests, End Term Exams
magnetic moment of complexes.	٧	٧	V	V		V	Applying	Yes	Mid semester tests, End Term Exams
CO 5: Applying related experiments for their research work.	٧	٧	٧	٧	٧	V	Applying	Yes	Mid semester tests, End Term Exams

Paper CHL504-18 Advanced Characterization Technique

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Understand the topography, morphology, composition,							a same con co	, and a second	Assessment roots to Measure Attainment of CO
relationship between composition and material properties.									
	٧			٧	V		Understanding	Yes	Mid semester tests, End Term Exams
CO 2: Learn the functioning of the X-ray diffractometer, about its	W. D.					Mariano			What semester tests, and refin exams
components and would be able to determine the crystal structure	Marie Control								
of a material, find impurity in the material, different phases		10000							
present in the mixture of compound qualitative as well as	204/10						Understanding		
functionalities	٧	V	V	V		V	and Analyzing	Yes	Mid semester tests, End Term Exams
CO 3: Understand the instrumentation of TGA and also to	200		1000			all the same	15000 1000 1000	100	Mid semester tests, and Term Exams
calculate the weight loss with temperature, types of changes									
occurring in the material/substances during thermal breading,									
enthalpy changes during heat treatment of a compound.	V	V	V	V	18 18 18 18	V	Understanding a	Yes	Mid competent of Fully 5
CO 4: Apply the knowledge of various characterization techniques	WEST T	7230.79		1 1 1 1 1 1				163	Mid semester tests, End Term Exams
n material industries, metallurgy industries, electronic industries,			The same is			The second			
civil Engineering.	٧	V	V	V .	V	V	Understanding, A	Yes	Mid competents Full Town F
CO 5: Apply the quantitative and qualitative separation	100						8,1	103	Mid semester tests, End Term Exams
echniques in purification			13.5	1					
and its applications in food industry, pharmaceutical industry,							Understanding.		
purification, removal of pollutants, medicinal chemistry and		100	1000	1 Street	10000		Analyzing and		
essential oils.	٧	V	V	V	V	V	applying	Yes	Mid semester tests. End Term Exams

Paper CHP506-18 Advanced Chemistry Lab-II

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
			1-10				Understanding,		
CO1: Emphasize the importance of different techniques used for				A SHEET			Apply, Analyse,		
titration viz. potentiometery, pHmetry and amperometry.	٧	٧	V	٧	٧	V	Create	Yes	Mid semester tests, End Term Exams
CO 2: Correlate the theoretical and practical aspects and know				100			Understanding,		The semester tests, and rethir Exams
about the limits of the experimental error.	٧	٧	V		٧	V	Apply	Yes	Mid semester tests, End Term Exams
CO 3: Determine the various physical parameters for the various	No.	The same		Y Wash			100000000000000000000000000000000000000	White the contract of the cont	Wild Semester tests, End Term Exams
problems under study.	٧	٧	V	V	13.55	V	Evaluate	Yes	Mid semester tests, End Term Exams
CO 4: Verify various laws studied in the theory part.	٧	V	٧	٧		٧	Analyse	Yes	Mid semester tests, End Term Exams

Paper CHL512A-18 Advanced Physical Chemistry

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Understand major aspects of chemical terminology related	10.72					6 20 10 1	Understand.		PROGRAMMENT IBOIS TO MEASURE ACCOMMINENT OF CO
to surface science, polymers and electrode processes.	V	V	V	V	V	V	Remember	Yes	Mid semester tests, End Term Exams
CO 2: Develop insights in the micelle formation process and		S S S S S S	A MITTER	-	N PONTS	G Wash		103	iviid semester tests, End Term Exams
emphasize its application in daily life.									
	٧	V	٧	V	٧	V	Apply, Analyse	Yes	Mid semester tests, End Term Exams
CO 3: Know about polymers in detail.	V	٧	V	V		٧	Remember	Yes	Mid semester tests, End Term Exams
CO 4: Correlate various types of voltammetric techniques and	12000		200				Apply, Analyse,		wild semester tests, and term exams
heir importance in sensing field.	V	٧	V	٧		V	Evaluate	Yes	Mid semester tests, End Term Exams

Paper CHL512E-18 Green Chemistry

					and the second	College and the same			
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO

CO1: Conceptualize the various syntheses using novel and greener methods.	v	V	V	V	V	Understanding	Yes	
O 2: Predict the relationships between organic chemical		1 100	- 1030			and standing	ies	Mid semester tests, End Term Exams
structures and their reactivity in different greener and benign conditions.	٧	V	V	V	V	Evaluation	Yes	
CO 3: Learn the fundamental and advanced concepts of green	7						res	Mid semester tests, End Term Exams
chemistry in reaction mechanisms.	٧	V	V	V	V	Understanding	Yes	M
CO 4: Apply the new methodologies for altering the reactivity	0.00	1 2	1100		77 8.00	- Table State of the State of t	Tes	Mid semester tests, End Term Exams
patterns of substrates	V	V	V	V	V	V Applying	Yes	Mid
CO 5: Synthesize various molecules using combinations of reactive						- T- 1 - 0	163	Mid semester tests, End Term Exams
pecies in novel conditions.	٧	V	V	V	V	Applying	Yes	Mid semester tests, End Term Exams

Name of the Department: Chemical Sciences Programme: B.Sc. Honours Chemistry

Paper BHHL105-19 Communicative English-I

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Students will acquire basic proficiency in reading	1000				1007/01/01	7	- 2000000000000000000000000000000000000		The state of the s
&listening, writing and speaking skills.	٧	V	V	V	V	V	Understanding	Yes	Mid semester tests, End Term Exams
CO 2: Students will be able to understand spoken and written		- Total				77.6%			The service costs, and rem cause
English language, particularly the language of their chosen			1000		100				
technical field.	V	٧	V	V	V	V	Understanding	Yes	Mid semester tests, End Term Exams
CO 3: They will be able to converse fluently and produce on their			A Property			19 18 to 19 1			and a second total part of the Examp
own clear and coherent texts.	٧	V	V	٧	V	V	Applying	Yes	Mid semester tests, End Term Exams
CO 4: Students will become proficient in professional				1	K TO THE				The second secon
communication such as interviews, group discussions, office	75	1000				100			
environments, important reading skills as well as writing skills	V	V	V	V	V	V	Applying	Yes	Mid semester tests, End Term Exams

Paper BHCP107-19 Inorganic Chemistry Lab-

Course Outcome	PO 1	PO Z	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Understand to calibrate and run the instruments for analysis.	٧	V	V	V				Yes	Mid semester tests, End Term Exams
CO 2: Learn to the quantitative analysis of various metal							0.00		inia semester tests, ena remi exams
ions/cations and anions.	٧	V	٧	V	V	V		Yes	Mid semester tests, End Term Exams
CO 3: Understand the various principles of different techniques				10 - 3 -		The state of	No. 1		- I and the second seco
involved in the quantitative analysis.	٧	V	V	٧	V	V		Yes	Mid semester tests, End Term Exams
CO 4: Learn to prepare various inorganic compounds.	٧	٧	٧	V			A CONTRACTOR	Yes	Mid semester tests, End Term Exams

Paper BHCP108-19 Organic Chemistry Lab-I

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: To check the purity of organic compounds by determining		3 7000					A COMPLETE		
the melting or boiling points	V	V	V	V	٧		Understand	Yes	Mid semester tests, End Term Exams
CO 2: To develop preparative skills for purification of organic							Understand and		Company and Company and Company
compounds by crystallization method.	V	V	V	V	V		apply	Yes	Mid semester tests, End Term Exams
CO 3: To determine the element or functional groups present in	1997						Understand and		The serves costs, and refin exams
organic compound by organic qualitative analysis.	V	V	V	V	V		apply	Yes	Mid semester tests, End Term Exams
CO 4: To present their work with practical skills and the awareness				1000	1 300				
of health and safety procedures.	٧	V	V	V	V	٧	Apply	Yes	Mid semester tests, End Term Exams
CO 5: To apply related experiments for their research work	٧	٧	٧	٧	٧	٧	Apply	Yes	Mid semester tests, End Term Exams

Paper BHHL115-19 Communicative English-II

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Students will acquire basic proficiency in LSRW skills-			7 2 2 3 5 0		100000				
listening, speaking, reading, and writing.	V	V	V	V	V	V	Applying	Yes	Mid semester tests, End Term Exams
CO 2: Students will be able to develop their vocabulary so that									Wild Service Coop, End Territ Exams
they can understand spoken and written English language,									
particularly the language of their chosen technical field	V	V	V	V	V	V	Understanding	Yes	Mid semester tests, End Term Exams
CO 3: Students will be introduced to the skills and strategies of	Diel 17	A Company			Market .	N. Carlot			This services to be, and refin exams
reading and writing by identifying organizational patterns,									
spotting classification systems and understanding associations									
between ideas through study of literary texts.	V	V	V	V	V	V	Understanding	Yes	Mid semester tests, End Term Exams
CO 4: Students will be able to converse fluently and produce on	146.00			a service		A Market			That serves tests, End Term Exams
their own clear and coherent texts.	V	V	V	V	V	V	Applying	Yes	Mid semester tests, End Term Exams
CO 5: Students will be able to improve the employability of		A							And a series of tests, and testing and testing
students and make them proficient in professional									
communication through understanding of career documents; job		1			1				
interviews; group discussions; internal communication in office									
environments etc.	V	V	V	V	V	V	Applying	Yes	Mid semester tests. End Term Exams

Paper BHCP117-19 Inorganic Chemistry Lab-II

				NAME AND ADDRESS OF THE OWNER, WHEN PARTY OF T	CON CONTRACTOR OF THE PARTY OF	-			
Course Outcome	PO 1	IPO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
							Section 1	Language Lan	Passessment tools to inteasure Attaninient of Co

CO1: CO1. Understand the concept of qualitative analysis.	V	V	٧	V			Understanding	Yes	Mid semester tests, End Term Exams
CO 2: CO2. Learn to identify present cations and anions through					S. 1886				The serves tests, the remit Exemp
qualitative analysis of various metal ions/cations and anions.	V	V	V	V	V	٧	Applying	Yes	Mid semester tests, End Term Exams
CO 3: CO3. Understand the various techniques/principles involved		70		. Y 7000		100			The serves tests, the remit than
n the qualitative analysis of mixtures in presence or absence of		Harry	18 187		100				
interfering ions.	V	V	V	V			Understanding	Yes	Mid semester tests, End Term Exams
CO 4: CO4. Learn to separate and identify less familiar ions	1		22 (1) (1)		- 1				The services (cots) and retriff and its
through qualitative analysis.	٧	V	V	V	V	V	Understanding	Yes	Mid semester tests, End Term Exams

	Paper	BHCP118-19 Ph	vsical Chemistry	Lab-
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Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Understand the basic procedures for carrying out a physical									
chemistry practical like preparation and standardisation of	1						Understanding,		
solutions, handling the equipments and measuring with precision.	V	V	V		V	V	Apply	Yes	Mid semester tests, End Term Exams
CO 2: Correlate the theoretical and practical aspects and know			380		Boys a.		Understanding,		This services (CSC), Elle Terri Exeris
about the limits of the experimental error.	V	V	V		V	V	Apply	Yes	Mid semester tests, End Term Exams
CO 3: Determine the various physical parameters for the various	-		100		1000	Marie -			The server (cost) End Ferni Ending
problems under study.	٧	٧	٧	٧		٧	Evaluate	Yes	Mid semester tests, End Term Exams
O 4: Verify various laws studied in the theory part.	٧	٧	٧	٧		V	Analyse	Yes	Mid semester tests, End Term Exams
	100	No real		230000				Yes	Mid semester tests, End Term Exams

Paper UC-BSHP-125-19 Physics Lab-II

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Able to verify the theoretical concepts/laws learnt in theory				1920					The state of the s
courses.	V	V	٧	٧	V	٧ .	understand	Yes	Mid semester tests, End Term Exams
CO 2: Trained in carrying out precise measurements and handling			122			1 12 16 1			
sensitive equipment.	V	V	V	V	V	V	understand	Yes	Mid semester tests, End Term Exams
CO 3: Understand the methods used for estimating and dealing				O CONTRACTOR					
with experimental uncertainties and systematic "errors".	V	V	V	V	V	V	apply	Yes	Mid semester tests, End Term Exams
CO 4: Learn to draw conclusions from data and develop skills in				a Composition					The second costs, and refin and the second
experimental design.	V	V	V	V	V	V	apply	Yes	Mid semester tests, End Term Exams
CO 5: Document a technical report which communicates scientific				W. V.S.	1377 8				
information in a clear and concise manner.	V	V	V	V	V	V	apply	Yes	Mid semester tests, End Term Exams

Paper BHCL203-19 Spectroscopy

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Understand the fundamental principles and theories of						100			
various spectroscopic techniques	V	V	V	V	V	5/4/5	Understanding	Yes	Mid semester tests, End Term Exams
CO 2: Learn the interaction of various electromagnetic radiations									Time services (e.s.s.), Elia Ferri Exams
with matter	V	٧	٧	V	V	APE.	Applying	Yes	Mid semester tests, End Term Exams
CO 3: Learn about the behaviour of different types of compounds			New Year						The series costs, and rem exams
towards different electromagnetic radiations	V	V	V	V	V	V	Applying	Yes	Mid semester tests, End Term Exams
CO 4: Understand the applications of interaction of light in their			43.5	1335	18/3/201	G THE			Wild Schlester tests, End Territ Exams
characterization	V	V	V	V	V		Understanding	Yes	Mid semester tests, End Term Exams
CO 5: Learn about the role of different techniques in the			E 120 140	TR. SA					Trind Series Co. Co., End Terri Exams
characterization of different compounds	V	V	V	V	V	V	Applying	Yes	Mid semester tests, End Term Exams

Paper BHCP206-19 Organic Chemistry Lab-II

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: To synthesise organic compounds by conventional and							Understanding		
greener approach.	V	V	V	V	٧		and Apply	Yes	Mid semester tests, End Term Exams
CO 2: To develop preparative skills for purification of organic	13.77		Bert				Understanding		
compounds by crystallization method.	٧	V	V	V	V		and Apply	Yes	Mid semester tests, End Term Exams
CO 3: To separate the organic compound by thin layer	A Miles						Understanding		
chromatography technique.	٧	٧	V	V	V		and Apply	Yes	Mid semester tests, End Term Exams
CO 4: To present their work with practical skills and the awareness		755							
of health and safety procedures.	٧	٧	V	V	V	٧	Apply	Yes	Mid semester tests, End Term Exams
CO 5: To apply related experiments for their research work	٧	٧	٧	٧	٧	٧	Apply	Yes	Mid semester tests, End Term Exams

Paper BHCP207-19 Physical Chemistry Lab-II

				-	-				
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO

CO1: Understand the basic procedures for carrying out a physical chemistry practical like preparation and standardisation of solutions, handling the equipments and measuring with precision.	V	V	V		V	V	Understanding, Apply	Yes	Mid semester tests, End Term Exams
CO 2: Correlate the theoretical and practical aspects and know						24 W.	Understanding,		
about the limits of the experimental error.	٧	V	V	1000	٧	V	Apply	Yes	Mid semester tests, End Term Exams
CO 3: Determine the various physical parameters for the various	118.71	8 8007	3 (1.10)		100				
problems under study.	٧	٧	V	V		٧	Evaluate	Yes	Mid semester tests, End Term Exams
4: Verify various laws studied in the theory part.	٧	V	٧	٧		٧	Analyse	Yes	Mid semester tests, End Term Exams
				100				Yes	Mid semester tests, End Term Exams

Janor	BUCI	212	10	Groon	Chemistry

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: CO1. Understand the fundamental concepts of green									
chemistry	V	V	V	V	V		Understanding	Yes	Mid semester tests, End Term Exams
CO 2: CO2. Learn the use of these fundamental principles for the		The Sales	9/2011			1878			The second secon
designing of various chemical reactions	V	٧	V	V	V		Understanding	Yes	Mid semester tests, End Term Exams
CO 3: CO3. Understand the various techniques available and their	12.16		The state of	1000	105	THE SE			
present applications in different green reactions	V	V	V	V	V	V	Understanding	Yes	Mid semester tests, End Term Exams
CO 4: CO4. Learn about the various applications of the green			The second		A STATE OF	10000			
chemistry	٧	V	٧	٧	٧	V	Applying	Yes	Mid semester tests, End Term Exams
CO 5: CO5. Understand the various expected future trends of the		Here les	No.	A CONTRACTOR	15835	20439			
green chemistry	V	V	٧	٧	٧	V	Applying	Yes	Mid semester tests, End Term Exams

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Study the nomenclature, classifications and bonding in	0.00			1 British	100				
polymers	V	V	V	٧			Understanding	Yes	Mid semester tests, End Term Exams
CO 2: Learn the criteria for the synthesis of polymers and	1000								
mechanism involved in polymerization	٧	٧	V	٧	٧		Understanding	Yes	Mid semester tests, End Term Exams
CO 3: Understand the morphology, kinetics and their structure	100000				1000000				
property relationship	٧	V	V	٧	V	٧	Understanding	Yes	Mid semester tests, End Term Exams
CO 4: Learn the various techniques used for determining the	Mark	1002	100				Understanding		
molecular weight of polymeric compounds	٧	V	V	V	V	٧	and Evaluation	Yes	Mid semester tests, End Term Exams
CO 5: Study the physical, thermal, Flow and Mechanical Properties	1000		100	-	13 12	A Part San	Understanding		
of Polymers	V	V	V	V	V	V	and Analysis	Yes	Mid semester tests, End Term Exams

Paper BHCL 216-19 Basic Analytical Chemistry

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Understand the basics of analytical chemistry.				E WALL	11689				
	٧	V	٧	V	V	V	Understanding	Yes	Mid semester tests, End Term Exams
CO 2:Know abou t soil and water, their sampling, analysis &	STAN		Name of						
purification methods.	٧	٧	٧	V	٧	V	Understanding a	Yes	Mid semester tests, End Term Exams
CO 3: Familarise with the principles and techniques of			n 3 12 14 1			S 8345-00			
chromatography.	V	٧	V	V		٧	Understanding	Yes	Mid semester tests, End Term Exams
CO 4: Aware of the nutritional value of various food items and									
concept of food processing and adulteration.	V	V	V	V	٧	٧	Understanding	Yes	Mid semester tests, End Term Exams
CO 5: Understand the functions of various constituents present in		Harry Control			Man Alak				
cosmetics.	V	V	V	V	V	V	Understanding	Yes	Mid semester tests. End Term Exams

Paper BHCP217-19 Inorganic Chemistry Lab-III

raper brice 217-25 morganic chemistry Lab-in									
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Understand the concept of qualntitative analysis.	٧	٧	٧	٧	٧	1000	Understanding	Yes	Mid semester tests, End Term Exams
CO 2: Understand the various techniques/principles involved in						100	Section 1		
the quantitative analysis for present metal ions.	٧	V	V	V	٧		Understanding	Yes	Mid semester tests, End Term Exams
CO 3: Learn to synthesize various inorganic compounds	٧	٧	٧	٧	٧	٧	Applying	Yes	Mid semester tests, End Term Exams
CO 4: Understand the principles involved in chromatographic									
separations	V	V	V	V	V		Understanding	Yes	Mid semester tests, End Term Exams
CO 5: Learn to estimate the cations present, through quantitative	The state of	NY ONLY IN							
analysis	٧	V	V	٧	V		Applying	Yes	Mid semester tests, End Term Exams

Paper BHCP218-19 Physical Chemistry Lab-III

Course Outcome PO 1 PO 2 PO 3 PO 4 PO 5 PO 6 Skill Focus on Employability / Entrepreneurship Assessment Tools to Measure Attainment of CO	0
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CO1: Identify the adulterants in common food items.	V	V			V	1	Understanding and Analyzing	Yes	Mid semester tests. End Term Exams
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
Paper BHCP219-19 Basic Analytical Chemistry Lab									
								Yes	Mid semester tests, End Term Exams
CO 4: Verify various laws studied in the theory part.	٧	٧	٧	٧		٧	Analyse	Yes	Mid semester tests, End Term Exams
problems under study.	٧	٧	V	٧		٧	Evaluate	Yes	Mid semester tests, End Term Exams
CO 3: Determine the various physical parameters for the various		V	- V	- AND COLOR	V	V	Apply	Yes	Mid semester tests, End Term Exams
CO 2: Correlate the theoretical and practical aspects and know about the limits of the experimental error.	1	1	1		.,	,,	Understanding,		
chemistry practical like preparation and standardisation of solutions, handling the equipments and measuring with precision.	٧	V	V		V	v	Understanding, Apply	Yes	Mid semester tests, End Term Exams
CO1: Understand the basic procedures for carrying out a physical									

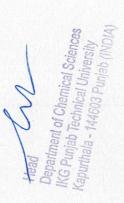
Contraction	PU I	1202	PUS	104	PUS	PUB	SKIB	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Identify the adulterants in common food items.	Manage S						Understanding		
	V	٧			٧	٧	and Analyzing	Yes	Mid semester tests, End Term Exams
CO 2: Analyse samples of soil (pH) and water (pH, acidity,	39		10000				Understanding		
alkalinity etc)	V	V	V	٧	V	V	and Analyzing	Yes	Mid semester tests, End Term Exams
CO 3: Learn the paper chromatographic technique for separation	1500	A STAN	District of				Understanding		
of metal ions.	٧	V	٧			٧	and Analyzing	Yes	Mid semester tests, End Term Exams
O 4: Learn the spectrpphotometric determination of compounds	2000	125.75	4 3 1 3				Understanding		
n commercial products.	٧	٧	٧	V	٧	٧	and Analyzing	Yes	Mid semester tests, End Term Exams
	No.		1576						

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Understand the structure & functions of Biomolecules.	٧	٧	٧	٧	٧		Understanding	Yes	Mid semester tests. End Term Exams
CO 2: An advanced understanding and applied knowledge of the		H Walt			A Comment		(Manager)		The state of the s
theory of clinical biochemistry.	V	V	V	٧	V		Understanding	Yes	Mid semester tests, End Term Exams
CO 3: A critical understanding of how biochemical investigations							Marie State		
are employed to develop a clinical diagnosis.	٧	٧	V	٧	٧		Understanding	Yes	Mid semester tests, End Term Exams
CO 4: To gain knowledge and understanding of clinical disorders.	v	٧	V	V	V		Understanding	Yes	Mid semester tests, End Term Exams
CO 5: To gain knowledge of biological samples and their collection	1			1		N. A.			and the second s
procedures.	V	V	V	V	V		Applying	Yes	Mid semester tests, End Term Exams

Paper BHCL305-19	Inductrial	Chemicals and	the	Environment
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Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: understand different toxic gases and their toxicity hazards, Safe design systems for large scale production of Industrial gases.	٧	V	V		٧	V	Understand, Analyze and Apply	Yes	Mid semester tests, End Term Exams
CO 2: Understand manufacturing processes, handling and storage of inorganic chemicals and knowledge of Hazardous effects of the inorganic chemicals on human beings and vegetation.		V			٧	V	Understanding	Yes	Mid semester tests, End Term Exams
CO 3: understand the requirement of ultra-pure metals for the semiconducting technologies.				٧	٧		undersatnding	Yes	Mid semester tests, End Term Exams
CO 4: understand different sources, effects and control measures of air, water pollutants, water quality parameters, different methods of Treatment of effluents from different sources.	٧	V	٧	٧	v	٧	Understand and Analyze	Yes	Mid semester tests, End Term Exams
CO 5: understand different sources of energy, source of nuclear waste and its disposal. Use of biocatalyst in chemical industries.			v	V	V	٧	Understand and Analyze	Yes	Mid semester tests, End Term Exams

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Understand the fundamental concepts of various aspects of	A STATE OF					10000			
Ligand Field Theory	٧	٧	V	V	٧		Understanding	Yes	Mid semester tests, End Term Exams
CO 2: Learn the different aspects of crystal field theory	V	V	٧	٧	٧	٧	Applying	Yes	Mid semester tests, End Term Exams
CO 3: Understand the effect of weak , medium and strong crystal			A Mich				A STATE OF THE STA		to a series to a s
field on free ions	V	V	V	V	V	1235	Understand	Yes	Mid semester tests, End Term Exams
CO 4: Learn about the electronic spectra of transition metal									
complexes	V	V	V	٧	٧	V	Applying	Yes	Mid semester tests, End Term Exams
CO 5: Understand the factors affecting the electronic spectra of		The state of				1.500			
the complexes	V	V	V	V	V		Understand	Yes	Mid semester tests, End Term Exams



Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of C
CO1: Understand the concept of quantitative analysis.	V	V	V	V	V		Understand	Yes	Mid semester tests. End Term Exams
CO 2: Learn to estimate the present cations through quantitative	-	1	1	1	1	No. of Concession,	Officer stand	ies .	wild semester tests, thu ferm txams
analysis	V	V	V	V	V	V	Applying	Yes	Mid semester tests, End Term Exams
CO 3: Understand the various techniques/principles involved in	+	1	1	-	1		Abbiling	163	iviid serilester tests, Elid Terrii Exams
the quantitative analysis present metal ions.	V	V	V	V	V	184	Understand	Yes	Mid semester tests, End Term Exams
CO 4: Learn to perform the volumetric analysis using different	1		1	1	1		Onderstand	163	Wild Selflester tests, Elid Terrii Exallis
methods.	V	V	V	V	V	V	Applying	Yes	Mid semester tests. End Term Exams
The Chicago	1.	1.	1.	1.	1.		Tubbishing	165	iviid serilester tests, Elid Terrii Exams
Paper BHCP308-19 Organic Chemistry Lab-III	42/2								
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of C
CO1: To synthesise organic compounds by various approach.	V	V	٧	V	V	THE RES	Understanding	Yes	Mid semester tests. End Term Exams
CO 2: To develop preparative skills for purification of organic		1		- 10/5500			Understanding		
compounds by crystallization method.	V	V	V	V	V		and evaluation	Yes	Mid semester tests, End Term Exams
CO 3: To separate the organic compound by thin layer			A				Analysis and		
chromatography technique.	V	V	V	V	V		Evaluation	Yes	Mid semester tests, End Term Exams
CO 4: To present their work with practical skills and the awarenes	s			9 8 7 7 7	1000				
of health and safety procedures.	V	V	V	V	V	V	Analysis	Yes	Mid semester tests, End Term Exams
CO 5: To apply related experiments for their research work	V	٧	V	V	V	V	Analysis	Yes	Mid semester tests, End Term Exams
		23.75	70000		7.87				
aper BHCL313-19 Catalysis									
ourse Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of C
O1: Understand the Organometallic chemistry	٧	٧	٧	٧	٧		Understanding	Yes	Mid semester tests, End Term Exams
CO 2: Understand the fundamental concepts of various concepts		10000		Non-					
nvolved in catalysis.	٧	٧	٧	V	٧	2.7	Understanding	Yes	Mid semester tests, End Term Exams
CO 3: Learn different application of catalysis in the synthesis of		0.74		14770		6466			
organic compounds.	V	٧	V	V	V		Apply	Yes	Mid semester tests, End Term Exams
CO 4: To Understand role of catalysis in biological model	٧	٧	٧	V	٧	٧	Apply	Yes	Mid semester tests, End Term Exams
Paper BHCL314-19 Analytical Methods in Chemistry	1		-	-	1				
Course Outcome	PO 1	PO Z	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of C
CO1: explain the fundamentals of analytical chemistry and steps									
of a characteristic analysis.	٧	٧	٧		V	٧	Understanding	Yes	Mid semester tests, End Term Exams
							Apply, Analyse,		
O 2: estimate kinds of errors in chemical analysis.	٧	٧	V	V	V	٧	Evaluate	Yes	Mid semester tests, End Term Exams
O 3: identify quality of experimental measurements.	٧	٧	٧	٧	٧	٧	Remember	Yes	Mid semester tests, End Term Exams
O 4: interpret the sources of random errors and effects of	18.34						Understanding,		
andom errors on analytical results.	٧	٧	V	٧	V	٧	Apply, Evaluate	Yes	Mid semester tests, End Term Exams
CO 5: Familiarise with various analytical techniques and compare					100	040	Understanding,		
hem.	V	V	V	٧	٧		Remember	Yes	Mid semester tests, End Term Exams
aper BHCL315-19 Nanochemistry									
ourse Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of C
O1: Understand the fundamental concepts of nanomaterials.	٧	٧	٧	٧	٧		Understanding	Yes	Mid semester tests, End Term Exams
O 2: Learn the different methods of chemical synthesis of					A Same	(A. 196)			
anoparticles.	٧	٧	٧	٧	V		Applying	Yes	Mid semester tests, End Term Exams
O 3: Understand the basic techniques about the organic	100000		1			1 THE R. P. LEWIS CO., LANSING, MICH.			
O 5. Onderstand the basic techniques about the organic									
anoparticles.	٧	V	V	٧	٧		Understanding	Yes	Mid semester tests, End Term Exams
지하면 하게 되는 아니는 아니는 아니는 아니는 아니는 아니는 아니는 아니는 아니는 아니	٧ ٧	V V	V V	٧ ٧	√ √	٧	Understanding Applying	Yes Yes	Mid semester tests, End Term Exams Mid semester tests, End Term Exams

Head Department of Chemical Sciences IKG Punjab Technical University Kapurthala - 144603 Punjab (INDIA)

Assessment Tools to Measure Attainment of CO

Mid semester tests, End Term Exams

Course Outcome

molecular modelling.

modelling.

Paper BHCL316-19 Molecular Modelling and Drug Design

CO1: Understand the fundamental concepts of molecular

CO 2: Learn the different methods of energy minimization and computer simulation.
CO 3: Understand the basic concepts of molecular dyanamics.

CO 4: Learn about the various concepts of drug designing and

PO 1

PO 2

PO 3

PO 4

PO 5

PO 6 Skill

Understanding

Understanding

Focus on Employability / Entrepreneurship

Yes

Yes

Yes

Yes

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: To study about properties of amino acids/proteins/enzymes.	٧	V	V	V	V		Understanding	Yes	Mid semester tests. End Term Exams
CO 2: To estimate amino acids/proteins by various methods.	٧	٧	V	٧	٧	100	Analysis	Yes	Mid semester tests, End Term Exams
CO 3: To understand the isolation and characterisation of DNA.	٧	٧ .	V	٧	V	V	Understanding	Yes	Mid semester tests, End Term Exams
CO 4: To present their work with practical skills and the awareness of health and safety procedures.	v	V	V	V	V	V	Analysis	Yes	Mid semester tests, End Term Exams
CO 5: To apply related experiments for their research work	٧	V	V	V	V	٧	Analysis	Yes	Mid semester tests, End Term Exams Mid semester tests, End Term Exams

Paper BHCP319-19 Physical Chemistry Lab-IV

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Understand the basic procedures for carrying out a physical chemistry practical like preparation and standardisation of							Understanding.		
solutions, handling the equipments and measuring with precision.	٧	V	V		V	V	Apply	Yes	Mid semester tests, End Term Exams
CO 2: Correlate the theoretical and practical aspects and know	W. SAL			Village See		8 8 8 8	Understanding,	Who the track of the service of the service of	Wild Seriester tests, End Term Exams
about the limits of the experimental error.	V	V	V	A STATE	V	V	Apply	Yes	Mid semester tests, End Term Exams
CO 3: Determine the various physical parameters for the various	1500	4 1875		DAY STREET	The Control				wild Schlester tests, Life Territ Exams
problems under study.	٧	V	٧	V		V	Evaluate	Yes	Mid semester tests, End Term Exams
CO 4: Verify various laws studied in the theory part.	٧	٧	٧	V		٧	Analyse	Yes	Mid semester tests, End Term Exams

