GENERIC ELECTIVE

Title of the		CHEMISTRY FOR PHYSICAL SCIENCES I							
Course		(FOR MATHEMATICS & PHYSICS							
	5	STUDENTS)							
Paper No.	Generic	Elective I							
Category	Generic	Year	I Credits	3	Course	23BCHA1			
	Elective	Semester	Ι		Code				
Instructional	Lecture	Tutorial	Lab Practi	ice	Total				
hours per week	4	-			4				
Prerequisites	Higher se	condary che	mistry						
Objectives of the	This cours	se aims to p	rovide knowl	edge	on the				
course	• ba	sics of atom	nic orbitals, c	hem	ical bonds, h	ybridization			
	• cc	oncepts of th	ermodynami	cs ar	nd its applicat	tions.			
	• cc	oncepts of nu	uclear chemis	stry					
	• in	portance of	chemical ind	dustr	ies				
	• Q	ualitative an	d analytical	meth	ods.				
UNIT I	Chemic	al Bonding	and Nuclea	r Cł	nemistry				
	Chemic	al Bonding:	Molecular	Orbi	tal Theory-b	onding,			
	antibon	ding and no	n-bonding of	bital	s. Molecular	orbital diagrams			
	for Hyd	lrogen, Heli	um, Nitrogen	; dis	cussion of bo	ond order and			
	magnet	ic properties	. Nuclear Cl	nemi	stry: Funda	mental particles			
	- Isoto	opes, Isoba	rs, Isotones a	and	Isomers-Diffe	erences between			
	chemica	al reactions	and nuclear	reac	tions - group	o displacement			
	law. Nu	iclear bindir	ng energy - n	nass	defect - cal	culations.			
	Nuclear	fission an	nd nuclear f	usior	n - difference	es – Stellar			
	energy.	Application	ns of radio is	sotop	bes – carbon	dating, rock			
	dating a	and medicina	al application	ls.					
	Industr	rial Chemis	try						
	Fuels: Fu	el gases: Na	tural gas, wa	ter g	as, semi wate	er gas, carbureted			
UNIT II	water gas	, producer g	as, CNG, LP	G ar	id oil gas (ma	anufacturing			
	details no	t required).	Silicones: Sy	/nthe	sis, propertie	s and uses of			
	silicones.								
	Fertilizers	s: Urea, amr	nonium sulpl	nate,	potassium ni	trate, NPK			
	fertilizer,	superphosp	hate, triple su	ıperp	bhosphate.				
	Fundar	nental Con	cepts in Org	anic	Chemistry				
	Hybridiza	tion: Orbita	l overlap, hyl	oridiz	zation and ge	ometry of CH4,			
	C2H4, C2H2 and C6H6. Electronic effects: Inductive effect and								
UNIT III	consequences on Ka and Kb of organic acids and bases,								
	electrome	ric, mesome	eric, hyper co	njuga	ation and ster	ric- examples.			
	Reaction mechanisms: Types of reactions-aromaticity (Huckel's								
	rule)– ar	omatic elec	trophilic su	bstitı	ution; nitrati	on, halogenation,			
	Friedel- (Craft's alkyl	lation and a	cylati	ion. Heteroc	yclic compounds:			
	Preparatio	on, propertie	s of pyrrole a	und p	yridine.				
	Thermod	ynamics an	d Phase Equ	ıilib	ria				
UNIT IV	Thermody	namics: Ty	pes of sys	stems	s, reversible	and			
	irreversibl	e processes,	isothermal	and	adiabati	c processes			

	and spontaneous processes. Statements of first law and second law of thermodynamics. Carnot's cycle and efficiency of heat engine. Entropy and its significance. Free energy change and
	of entropy and Gibbs free energy. Relationship between Gibbs free energy and entropy. Phase Equilibria: Phase rule - definition of
	terms in it. Applications of phase rule to water system. I wo component system - Reduced phase rule and its application to a simple eutectic system (Pb-Ag).
UNIT V	 Analytical Chemistry Introduction to qualitative and quantitative analysis. Principles of volumetric analysis. Separation and purification techniques – extraction, distillation and crystallization. Chromatography: principle and application of column, paper and thin layer chromatography.
Extended	Ouestions related to the above topics, from various competitive
Professional	examinations UPSC/ JAM /TNPSC others to be solved
Component (is a	(To be discussed during the Tutorial hours)
part of internal	
component only,	
Not to be included	
in the external	
examination	
question paper)	
Skills acquired	Knowledge, Problem solving, Analytical ability, Professional
from this course	Competency, Professional Communication and Transferable skills.
Recommended	1. V.Veeraiyan, Text book of Ancillary Chemistry; High
Text	mountpublishing house, Chennai, first edition, 2009.
	2. S.Vaithyanathan, Text book of Ancillary Chemistry; PrivaPublications, Karur 2006
	3 S ArunBahl B S Bahl Advanced Organic Chemistry:
	S Chand and Company, New Delhi, twenty third edition, 2012.
	4. P.L.Soni, H.M.Chawla, Text Book of Organic Chemistry;
	Sultan
	Chand & sons, New Delhi, twenty ninthedition, 2007.
Reference Books	5. P.L.Soni,MohanKatyal,TextbookofInorganicchemistry;Sultan Chan dandCompany,New Delhi, twentieth edition, 2007.
	6. B.R.Puri,L.R.Sharma,M.S.Pathania,TextbookPhysicalChemist ry;V ishalPublishingCo., New Delhi, fortyfortyseventh edition, 2018.
	7. B.K,Sharma,IndustrialChemistry;GOELpublishinghouse,Meerut, si
	xteenthedition, 2014.
Course Learning	Outcomes (for Mapping with POs and PSOs)
On completion of	the course the students should be able to

- CO 1: gain in-depth knowledge about the theories of chemical bonding, nuclear reactions and its applications.
- O 2: evaluate the efficiencies and uses of various fuels and fertilizers
 - CO 3: explain the type of hybridization, electronic effect and mechanism involved in theorganic reactions.
- O 4: apply various thermodynamic principles, systems and phase rule.
 - CO 5: explain various methods to identify an appropriate method for the separation ofchemical components

CO /PSO	PSO	PSO	PSO	PSO	PSO
	1	2	3	4	5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of	3.0	3.0	3.0	3.0	3.0
Course Contribution to POs					

Level of Correlation between PSO's and CO's

CO /PO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of	3.0	3.0	3.0	3.0	3.0
Course Contribution to POs					

Title of the	CHEMISTRY FOR PHYSICAL SCIENCES II (FOR						
Course	MATHEMATICS & PHYSICS STUDENTS)						
Paper No.	Generic E	lective II				ł.	
Category	Generic	Year	Ι	Credits	3	Course	23BCHA2
	Elective	Semester	II			Code	
Instructional	Lecture	Tutorial	La	b Practio	ce	Total	
hours per week	4	-	-			4	
Prerequisites	Chemistry 1	for physical	sciei	nces -I		I	
Objectives of the	This cours	se aims at pr	ovid	ling knov	vlec	lge on the	
course	Co-ordination Chemistry and Water Technology						
	Carboh	ydrates and	Am	ino acids			
	• basics	and applicat	ions	of electr	och	emistry	
	• basics	and application	ions	of kineti	cs a	and catalysis	
	Variou	s photochem	nical	phenom	eno	n	
UNIT I	Co-ordinat	ion Chemis	try	and Wa	ter	Technology	
	Co-ordinati	on Chemistr	y: D	efinition	of t	terms-IUPAC	Nomenclature
	- Werner's	theory - EA	N 1	rule - Pa	uliı	ng's theory -	- Postulates -
	Application	s to [Ni(Co	D)4]	, [Ni(CN	V)4]] ²⁻ ,[Co(CN)6] ³	³⁻ Chelation -
	Biological	role of Haer	nogl	obin and	Ch	nlorophyll (ele	ementary idea)
	– Application	ons in qualita	ative	and qua	ntit	ative analysis.	
	Water Tech	nology: Har	dnes	s of wate	er, d	letermination	of hardness of
	water usi	ng EDTA	n	nethod,	zε	eolite metho	od-Purification
	techniques-	BOD, COD	•				
	Carbohydı	ates and A	nine	o acids			
	Carbohyo	lrates: Clas	sific	ation, p	repa	aration and	properties of
	glucose,	fructose and	d su	icrose. D	Disc	ussion of op	en chain ring
Unit II	structures	s of glue	ose	and	fruc	ctose. Gluco	se –fructose
	interconv	ersion. Prop	ertie	s of starc	h a	nd cellulose.	
	A	mino acids:	Cla	assification	on	- preparation	and properties
	of alanın	e, preparatio	n of	dipeptid	es u	ising Bergmai	nn method. RNA
	and DNA	(elementary	/ 1de	a only).			
	Electroche	mistry	1 1	1	1	. 1 1	1 1 . 1
	Galvanic co	ells - Standa	rd h	ydrogen	elec	ctrode - calon	nel electrode -
	standard el	ectrode pole		lis -elect	roci	nemical serie	S. Strong and
	weak electr	orgies - tonic	s pro	Douct of N	vale	er -pH, pKa, p	okb. Conducto
	metric utra	lons - pri de		ination (by c		a Niekel and
	solutions al	ting Tyr	cal a	application	nis - fi	- electropiatin	g - Mickel allu
	nrevention	ung – Typ	505	of cells	-10		osion and its
	Vinatias	and Cataly					
	Order an	d moleculari	515 tx/	Integra	ted	rate expression	on for L and II
	$(2 \Lambda P_1)$	voducts) ord	er 1	eactions	D	rate expression	rder reaction
	methods	of determin	ing j	order of	רז מיי	eaction Hal	f-life period
	Catalveie	- homoger	ing '	s and h_{e}	u IV eter	ogeneous cat	alvst used in
	Contact	and Haher's	nro	cesses (lone	cent of energy	v of activation
	and Arrh	enius equatio	pro nn	000000. C		cept of energy	
		cinus equation					

UNIT V	Photochemistry Grothus-Draper's law and Stark-Einstein's law of photochemical equivalence, Quantum yield - Hydrogen-chloride reaction. Phosphorescence, fluorescence, chemiluminescence and photosensitization and photosynthesis (definition with examples).
Extended Professional Component (is a part of internal component only, Not to be includedin the external examination question paper)	Questions related to the above topics, from various competitive examinations UPSC/ JAM /TNPSC others to be solved (To be discussed during the Tutorial hours)
Skills acquired	Knowledge, Problem solving, Analytical ability, Professional
from this course Recommended Text	 Competency, Professional Communication and Transferable skills. V.Veeraiyan, Textbook of Ancillary Chemistry; High mountpublishing house, Chennai, first edition,2009. S.Vaithyanathan, Text book of Ancillary Chemistry; PriyaPublications, Karur,2006. Arun Bahl, B.S.Bahl, Advanced Organic Chemistry; S.Chand andCompany, New Delhi, twenty third edition, 2012. P.L.Soni, H.M.Chawla, Text Book of Organic Chemistry; SultanChand & sons, New Delhi, twenty ninth edition, 2007.
Reference Books	 P.L.Soni, Mohan Katyal, Text book of Inorganic chemistry; SultanChand and Company, New Delhi, twentieth edition, 2007. R.Puri, L.R.Sharma, M.S.Pathania, Text book Physical Chemistry; Vishal Publishing Co., New Delhi, forty seventh edition, 2018. B.K,Sharma, Industrial GOEL publishing house, Chemistry; Meerut, sixteenth edition, 2014.
Website and e-learning source	

Course Learning Outcomes (for Mapping with POs and PSOs)On completion of the course the students should be able to

CO 1: write the IUPAC name for complex, different theories to explain the bonding in coordination compounds and water technology

CO 2: explain the preparation and property of carbohydrate, amino acids and nucleic acids.

- **CO 3:** apply/demonstrate the electrochemistry principles in corrosion, electroplating and fuelcells.
- **CO 4:** identify the reaction rate, order for chemical reaction and explain the purpose of acatalyst.

CO 5: outline the various type of photochemical process.

CO /PSO	PSO	PSO	PSO	PSO	PSO5
	1	2	3	4	
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of					
Course Contribution to	3.0	3.0	3.0	3.0	3.0
PSOs					

Level of Correlation between PSO's and CO's

CO /PO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of	3.0	3.0	3.0	3.0	3.0
Course Contribution to POs					

Title of the	CHEMISTRY FOR BIOLOGICAL SCIENCES I(FOR						
Course	BOTANY ANI	ZOOLOG	Y STI	U DENTS)			
Paper No.	Generic Electi	ve III					
Category	Generic	Year	II	Credits 3		Course	23BCHA3
	Elective	Semester	III			Code	
Instructional	Lecture	Tutorial	Lab	Practice	Tot	al	
hours per	4	-	-		4		
week							
Prerequisites	Higher seccond	ary chemistry					
Objectives	This course aim	s at providing	g knov	wledge on			
of the	basics o	f atomic orbi	tals,	chemical b	onds	, hybridiz	ation and
course	fundame	entals of orga	nic ch	emistry		-	
	• nuclear	chemistry and	d indu	strial cher	nistr	У	
	importation	nce of special	lity dr	ugs and	-		
	 separati 	on and purific	cation	technique	s.		
UNIT I	Chemical Bo	nding and N	uclea	r Chemist	try		
	Chemical Bo	nding: Moleo	cular	Orbital Th	eory	-bonding,	antibonding
	and non-bond	ling orbitals.	М.	O diagran	ns fo	or Hydrog	en, Helium,
	Nitrogen; disc	cussion of bo	nd ord	ler and mag	gneti	c propertie	es.
	_				-		
	Nuclear Che	mistry: Fun	dame	ntal partic	eles	- Isotop	es, Isobars,
	Isotones and	Isomers-Dif	ferenc	es betwee	en ch	nemical re	eactions and
	nuclear reacti	ons- group d	isplac	ement law	. Nu	clear bind	ing energy -
	mass defect	- calculation	s. N	uclear fiss	ion	and nucle	ear fusion -
	differences -	- Stellar er	nergy.	Applicat	ions	of radi	oisotopes –
	carbon dating	, rock dating	and n	nedicinal a	pplic	ations.	
	Industrial Che	mistry					
	Fuels: Fuel gas	es: Natural g	jas, w	ater gas, s	semi	water gas	s, carbureted
Unit II	water gas, prod	ucer gas, CN	G, LF	G and oil	gas	(manufact	uring details
	not required).						
	Silicones: Synth	esis, properti	es and	d uses of s	ilicoı	nes.	
	Fertilizers: Ur	ea, ammoni	um s	sulphate,	pota	ssium n	itrate NPK
	fertilizer, superp	hosphate, trip	ole su	perphospha	ate.		
	Fundamental (Concepts in (Drgar	ic Chemis	stry		
	Hybridization:	Orbital overl	ap hy	bridization	1 and	d geometi	y of CH4,
	C2H4, C2H2	and C6H6.	Pol	ar effects	: Ir	nductive	effect and
UNIT III	consequences o	n Ka and K _b	of or	ganic acid	s and	d bases, el	lectromeric,
	mesomeric, hyp	er conjugatio	n and	steric-exa	mple	s and	
	explanation.Rea	ction mechai	nisms	Types	of r	eactions-	aromaticity-
	aromatic electro	philic substit	ution	; nitration	n, ha	alogenatio	n, Friedel-
	Craft's alkylatio	n and acylati	on.He	terocyclic	com	pounds:	Preparation,
	properties of p	yrrole and p	yridii	ne.		•	± ′

	Drugs and Speciality Chemicals						
UNIT IV	Definition, structure and uses: Antibiotics viz., Penicillin, Chloramphenicol and Streptomycin; Anaesthetics viz.,Chloroform and ether; Antipyretics viz., aspirin, paracetamol and ibuprofen; Artificial Sweeteners viz., saccharin, Aspartame and cyclamate; Organic Halogen compounds viz., Freon Teflon						
UNIT V:	Analytical Chemistry Introduction qualitative and quantitative analysis. Principles of volumetric analysis. Separation and purification techniques: extraction, distillation and crystallization. Chromatography: principle and application of column, paper and thin layer chromatography.						
Extended	Questions related to the above topics, from various competitive						
Professional	examinations UPSC/ JAM / INPSC others to be solved						
Component (1s a part of internal component only,	(To be discussed during the Tutorial hours)						
Not to be included							
in the external							
examination							
question paper)							
Skills acquired	Knowledge, Problem solving, Analytical ability, Professional						
from this course	Competency, Professional Communication and Transferable skills.						
Recommended	1. V.Veeraiyan, Textbook of Ancillary Chemistry; High						
Text	mountpublishing house, Chennai, first edition, 2009.						
	2. S.Vaithyanathan, Text book of Ancillary Chemistry; Priya						
	Publications, Karur, 2006.						
	3. ArunBahl, B.S.Bahl, Advanced Organic Chemistry;						
	S.Chandand Company, New Delhi, twenty third						
	edition,2012.						
	4. P.L.Soni, H.M.Chawla, Text Book of Inorganic						
	Chemistry;Sultan Chand & sons, New Delhi, twenty ninth edition, 2007.						
Reference Books	 P.L.Soni, Mohan Katyal, Text book of Inorganic chemistry; Sultan Chand and Company, New Delhi, twentieth edition, 2007. B.K,Sharma, Industrial Chemistry; GOEL publishing house,Meerut, sixteenth edition, 2014. Jayashree gosh, Fundamental Concepts of Applied Chemistry; Sultan & Chand, Edition 2006 						

Course Learning Outcomes (for Mapping with POs and PSOs)On completion of the course the students should be able to

CO1: state the theories of chemical bonding, nuclear reactions and its applications.

CO 2: evaluate the efficiencies and uses of various fuels and fertilizers.

- **CO 3:** explain the type of hybridization, electronic effect and mechanism involved in theorganic reactions.
- **CO 4:** demonstrate the structure and uses of antibiotics, anaesthetics, antipyretics and artificial sugars.

CO 5: analyse various methods to identify an appropriate method for the separation of

chemical components.

CO /PSO	PSO	PSO	PSO	PSO	PSO
	1	2	3	4	5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of					
Course Contribution to	3.0	3.0	3.0	3.0	3.0
PSOs					

Level of Correlation between PSO's and CO's

CO /PO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of	3.0	3.0	3.0	3.0	3.0
Course Contribution to Pos					

Title of the	CHEMISTI	RY FOR BI	OLO	GICAL S	SCI	ENCES II	
Course	(FOR BOT	ANY AND	ZOO	LOGY ST	ΓUI	DENTS)	
Paper No.	Generic El	ective IV				,	
Category	Generic	Year	II	Credits	3	Course	23BCHA4
	Elective	Semester	IV			Code	
Instructional	Lecture	Tutorial	Lab	Practice		Total	
hours per week	3	-	-			3	
Prerequisites	Chemistr	v for Biolog	vical S	Sciences I			
Objectives of	This course	e aims to pro	vide	knowledg	e ot	า	
thecourse	• nom	enclature of	coord	lination co	omr	ounds and ca	rbohvdrates.
	• Ami	no Acids an	d Ess	ential elen	nent	ts of biosyste	m
	• unde	erstand the co	oncep	ts of kine	tics	and catalysis	
	• prov	ide fundame	entals	of electro	che	mistry and pl	notochemistry
UNIT I	Co-ordina	ation Chem	istrv	and Wate	er T	cchnology	J
	Co-ordina	tion Chen	nistry	: Defini	itior	n of term	ns - IUPAC
	Nomencla	ture - Wer	ner'st	heory - H	EAN	V rule - Pau	ling's theory –
	Postulates	- Applica	tions	to [Ni(CO	4]. [Ni(CN)	$4]^{2}$.[Co(CN)6] ³⁻
	Chelation	- Biologi	cal	role of	He	moglobin a	nd Chlorophyll
	(elementa	rv idea) -	Appl	ications	in	qualitative a	nd quantitative
	analysis.		P P -				
	Water Tec	chnology: Ha	ardnes	ss of water	r. de	etermination	of hardness of
	water u	sing EDT	A 1	method.	zeo	olite metho	d-Purification
	techniques	s - BOD and	d COI	D.			
	Carbohydı	ates					
	Cla	ssification,	prepa	aration an	d 1	properties of	glucose and
UNIT II	fructose.	Discussion of	of ope	en chain i	ring	structures of	f glucose and
	fructose.	Glucose-fr	uctos	e interco	onve	ersion. Prep	paration and
	properties	of sucrose,	starch	and cellu	lose	2.	
	Amino A	cids and Es	sentia	l element	s of	f biosystem	
	Cla	ssification	- pr	eparation	an	d properties	of alanine,
UNIT III	preparatio	n of dipep	tides	using Be	ergr	nann methoo	1 - Proteins-
	classificat	ion – structu	re - C	Colour read	ctio	ns – Biologic	al functions –
	nucleoside	es -nucleotid	es – I	RNA and I	DN.	A – structure.	Essentials of
	trace meta	ıls in biologi	cal sy	rstem-Na,	Cu,	K, Zn, Fe, M	[g.
UNIT IV	Electroch	emistry					
	Galvanic	cells - Stand	lard h	ydrogen e	elec	trode - calor	el electrode -
	standard	electrode po	otentia	als -electr	och	emical series	s. Strong and
	weak ele	ctrolytes -	ionic	e product	of	water -pH	, pKa, pKb.
	Conductor	metric titrat	tions	- pH d	eter	mination by	colorimetric
	method -	- buffer so	olution	ns and i	its	biological a	pplications -
	electroplat	ting - Nicke	and and	chrome	plat	ting – Types	of cells -fuel
	cells-corro	osion and its	preve	ention.			
	Photoche	mistry		10.1-		•••	1 . 1
UNIT V	Grothus -	Drapper's la	aw an	d Stark-Ei	Inst	ein's law of p	photochemical
	equivalent	ce, Quantu	m y	ieia - E	iydi	rogen -chlor	at reaction.
	Phosphore	escence, fluc	resce	nce, chem	111U1	ninescence a	na
	photosens	itization and	phot	osynthesis	(de	etinition with	examples).

Extended	Questions related to the above topics, from various competitive
Professional	examinations UPSC/ JAM /TNPSC others to be solved
Component (is	(To be discussed during the Tutorial hours)
a part of	
internal	
component	
only, Not to be	
includedin the	
external	
examination	
question paper)	
Skills acquired	Knowledge, Problem solving, Analytical ability, Professional
from this course	Competency, Professional Communication and Transferable skills.
Recommended	1. V.Veeraiyan, Textbook of Ancillary Chemistry; High mount
Text	publishing house, Chennai, first edition, 2009.
	2. S.Vaithyanathan, Text book of Ancillary Chemistry; Priya
	Publications, Karur, 2006.
	3. Arun Bahl, B.S.Bahl, Advanced Organic Chemistry; S.Chand
	and Company, New Delhi, twenty third edition, 2012.
	4. P.L.Soni, H.M.Chawla, Text Book of Organic Chemistry;
	SultanChand & sons, New Delhi, twenty ninth edition, 2007.
Reference	1. Arun Bahl, B.S.Bahl, Advanced Organic Chemistry;
Books	S.Chandand Company, New Delhi, twenty third edition,
	2012.
	2. P.L.Soni, H.M.Chawla, Text Book of Organic Chemistry;
	Sultan Chand & sons, New Delhi, twenty ninth edition,
	2007.
	3. P.L.Soni, Mohan Katyal, Text book of Inorganic chemistry;
	Sultan Chand and Company, New Delhi, twentieth edition,
	2007.
	4. B.R.Puri, L.R.Sharma, M.S.Pathania, Text book Physical
	Chemistry; Vishal Publishing Co., New Delhi, forty
	seventhedition, 2018.
	5. B.K, Sharma, Industrial Chemistry; GOEL publishing house,
	Meerut, sixteenth edition, 2014.
Course Learnin	g Outcomes (for Mapping with POs and

PSOs)On completion of the course the students should be able to

- **CO 1:** write the IUPAC name for complex, different theories to explain the bonding in coordination compounds and water technology.
- **CO 2:** explain the preparation and property of carbohydrate.
- CO 3: enlighten the biological role of transition metals, amino acids and nucleic acids.
- **CO 4:** apply/demonstrate the electrochemistry principles in corrosion, electroplating andfuel cells.
- **CO 5:** outline the various type of photochemical process.

CO /PSO	PSO	PSO	PSO	PSO	PSO
	1	2	3	4	5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of					
Course Contribution to	3.0	3.0	3.0	3.0	3.0
PSOs					

CO /PO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of	3.0	3.0	3.0	3.0	3.0
Course Contribution to POs					

Title of the	CHEM	CHEMISTRY PRACTICAL FOR PHYSICAL AND								
Course		BIOLOGICAL SCIENCES								
	(for M	(for Mathematics and Physics – I Year/I Semester;								
	for	for Botany and Zoology II Year/III Semester)								
		(Uuiversity examination only 3 hrs)								
Paper No.	Generic	Generic Elective V								
Category	Generic	Year	I/ II	Credits	1	Course	23BCHAP1/			
	Elective	Semeste	I/III			Code	23BCHAP3			
		r								
Instructional	Lecture	Tutorial	Lab 1	Practice		Total				
hours per week	-	-	2			2				
Prerequisites										
Objectives of the	This	course ain	ns to p	rovide kn	owlee	dge on the				
course	• ba	sics of pre	paratio	n of solut	ions.	-				
	• pr	inciples an	d pract	tical expe	rienc	e of volume	tric analysis			
Course Outline	VOLUM	ETRIC AN	NALYS	SIS						
	1	. Estimatio	on of s	odium hy	drox	ide using st	andard			
		sodiume	arbonat	te.		_				
	2	. Estimatio	on of h	ydrochlor	ic ac	id using star	ndard oxalic			
		acid.								
	3	. Estimatio	on of fo	errous sul	phate	e using stand	lard Mohr's salt.			
	4	. Estimatio	on of o	xalic acid	usin	g standard f	errous sulphate.			
	5	. Estimatio	on of p	otassium	perm	nanganate us	ing standard			
		sodium h	nydroxi	de.	_	-	_			
	6	. Estimatio	on of n	nagnesium	ı usiı	ng EDTA.				
	7	. Estimatio	on of fe	errous ion	usin	g diphenyl a	mine as			
		indicator								
Reference Books	V.Venk	ateswaran,	R.Vee	rasamy, A	.R.K	Lulandaivelu	, Basic			
	Princip	lesofPractio	cal Che	mistry; S	ultan	Chand & so	ons, Second			
	edition,	1997.		·						
	D:-4	4 f F		7	-					
	Distribu	tion of Ext	terenal	marks-/	5mai	rKS				
	Record	-15								
	Procedu	re -15								
	Experim	ent - 45								
	Less that	n 2%								
	error-45	2 20/								
	25	2-3%-								
	35	2 40/								
	25	5-4%-								
	25	× 10/ 1/	-							
Comme La constant		>4%-1)	41. DO						

Course Learning Outcomes (for Mapping with POs and PSOs)On completion of the course the students should be able to

CO 1: gain an understanding of the use of standard flask and volumetric pipettes, burette.CO 2: design, carry out, record and interpret the results of volumetric titration. CO 3: apply their skill in the analysis of water/hardness.

CO4: analyze the chemical constituents in allied chemical products

CO /PSO	PSO	PSO	PSO	PSO	PSO
	1	2	3	4	5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
Weightage	12	12	12	12	12
Weighted percentage of Course Contribution to PSOs	3.0	3.0	3.0	3.0	3.0

Level of Correlation between PSO's and CO's

CO /PO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
Weightage	12	12	12	12	12
Weighted percentage of	3.0	3.0	3.0	3.0	3.0
Course Contribution to POs					

Title of the		CHEMISTRY PRACTICAL FOR PHYSICAL AND									
Course		BIOLOGICAL SCIENCES									
		(For Mathematics and Physics – I year/II semester;For									
		Botany and Zoology II year/IV semester) (Uuiversity examination only 3 hrs)									
Paper No.	Generic	Elective V	<u>I</u>								
Category	Generic	Year	I/ II	Credits	1	Cours	23BCHAP2/				
	Electiv	Semester	II/IV			eCode	23BCHAP4				
	e										
	-										
Instructional	Lecture	Tutorial	Lab	Practice		Total					
hours per week	-	-	2			2					
Prerequisites		<u> </u>									
Objectives of the	This	s course ain	ns to p	rovide kn	owl	edge on					
course	• 10	lentification	1 of or	ganic fun	ction	nal groups					
	• di	ifferent typ	es of o	rganic co	mpc	ounds with re	spect to their				
	pi	roperties.									
	• de	eterminatio	n of el	ements in	org	ganic compou	inds.				
	SYSTEM	IATIC AN	ALYS	IS OF O	RG	ANIC COM	POUNDS				
	The analy	'sis must be	e carrie	ed out as f	ollo	ws:					
		(a) Funct	ional g	roup tests	s [ph	nenol, acids (1	mono & di) aromatic				
		prima	ary am	ine, amid	es (1	mono & di),	aldehydeand glucose].				
		(b) Deter	ction o	f element	s (N	, S, Halogen	s).				
		(c) To d	istingu	ish betwe	en a	liphatic and	aromatic				
		comp	ounds	•							
		(d) To di	istingu	ish – Sati	irate	d and unsatu	rated compounds.				
Reference Books	V.Venk	tateswaran,	R.Vee	erasamy,	A.R	.Kulandaivel	u, Basic PrinciplesofPractical				
	Chemis	stry; Sultan	Chanc	l & sons,	Seco	ond edition, l	1997.				
	Distribu	tion of Ext	terenal	l marks-7	'5ma	arks					
	Record	-15									
			C 0								
	Organic	Analysis-(50	0							
	(a) Aron	(a) Aromatic/Aliphatic-10									
	(b) Satu	rated/Unsa	aturate	ed-10							
	(c) Elem	ients prese	nt-10								
	(d) Fund	tional gro	up pre	sent-20							
C I .	(e) Deriv	ative-10	•	·41 DO							
Course Learning	Outcomes	(for Map)	ping w	ith POs a	and	PSOs)On					
completion of the	course the	e students a	should	be able	to						

CO 1: gain an understanding of the use of standard flask and volumetric pipettes, burette.CO 2:

design, carry out, record and interpret the results of volumetric titration. CO 3: apply their skill in the analysis of water/hardness. CO4: analyze the chemical constituents in allied chemical products

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3

CO4	3	3	3	3	3
Weightage	12	12	12	12	12
Weighted percentage of					
Course Contribution to	3.0	3.0	3.0	3.0	3.0
PSOs					

Level of Correlation between PSO's and CO's

CO /PO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
Weightage	12	12	12	12	12
Weighted percentage of	3.0	3.0	3.0	3.0	3.0
Course Contribution to POs					