DEPARTMENT OF CHEMISTRY

(For those who joined from the academic year 2020-2021 onwards)

Programme Educational Objectives (PEOs)

PEOs	*Upon completion of B.Sc degree programme the graduates will*
PEO - 1	apply appropriate theory and scientific knowledge to participate in activities that support humanity and economic development nationally and globally, developing as leaders in their fields of expertise.
PEO - 2	pursue lifelong learning and continuous improvement of the knowledge and skills with the highest professional and ethical standards.
PEO - 3	become successful with in-depth knowledge, strong fundamentals and novel ideas that make them capable of interpreting and assimilating new information that mould them to excel in professional career.

Programme Outcomes (POs)

POs	*Upon completion of B.Sc degree programme, the graduates will be able to:*
PO - 1	apply the acquired scientific knowledge and innovative skills to face the future needs.
PO - 2	equip students with hands on training, reflect upon green initiatives and take steps to build a sustainable environment.
PO - 3	communicate proficiently and collaborate successfully with peers, colleagues and organizations.
PO - 4	acquire necessary skills for research, higher studies and entrepreneurship to create new scientific applications.
PO - 5	carry out research projects independently and in collaboration with other institutions and industries.

Programme Specific Outcomes (PSOs)

PSOs	*Upon completion of B.Sc Chemistry programme, the graduates will be able to:*
PSO - 1	understand the fundamentals, theories and principles of organic, inorganic and physical chemistry.
PSO - 2	analyze physical and chemical properties of chemical compounds and their uses.
PSO - 3	interpret the mechanism of various chemical reactions.
PSO - 4	synthesize organic and inorganic compounds using classical and modern methods.
PSO - 5	design and carry out scientific experiments, record and interpret the results with accuracy
PSO - 6	use concepts, tools and techniques related to chemistry to other branches of science.
PSO - 7	develop skills in the safe-handling of chemicals and their usage in day today life.
PSO - 8	develop entrepreneurial skills, empowered to fulfill the professional requirement and become self-dependent.

Course structure
Distribution of Hours and Credits

Course	Sem. I	Sem. II	Sem. III	Sem. IV	Sem. V	Sem.VI	Total	
							Hours	Credits
Part I - Language	6 (4)	6 (4)	6 (4)	6 (4)	-	-	24	16
Part II - English	6 (4)	6 (4)	6 (4)	6 (4)	-	-	24	16
Part - III								
Major Core - Theory	4 (4)	4 (4)	4 (4)	4 (4)	5+5+6 (5+5+6)	6+5+5 (6+5+5)	48	48
Major Core - Practical	2	2 (2)	2	2 (2)	3+3+2	3+3+2 (3+3+2)	24	12
Elective/Project	-	-	4 (3)	4 (3)	4 (3)	4 (3)	16	12
Allied -Theory	4 (3)	4 (3)	4 (3)	4 (3)	-	-	16	12
Allied Practical	2	2 (2)	2	2 (2)	-	-	8	4
Part - IV								
Add on Course (Professional English)	2(2)	2(2)	2 (2)	2 (2)	-	-	8	8
Non-Major Elective	2 (2)	2 (2)	-	-	-	-	4	4
SEC (Skill Enhancement Course)	2 (2)	2 (2)	-	-		2 (2)	6	6
AEC (Ability Enhancement Course)					2(2)		2	2
Total	**30(21)**	**30(25)**	**30(20)**	**30(24)**	**30(21)**	**30(29)**	**180**	**140**
Non Academic Courses								
Part -V								
*FC –I (Values for Life)	-	(1)	-	-	-	-	-	1
*FC– II(Personality Development)	-	-	-	(1)	-	-	-	1
*FC–III (Human Rights Education)	-	-	-	-	(1)	-	-	1
*FC –IV (Gender Equity Studies)	-	-	-	-	-	(1)	-	1
*SLP-Community Engagement Course (UBA)	(1)	(1)		-	-	-	-	2
*SLP-Extension activity (RUN)			-	(1)				2
*STP - Clubs & Committees / NSS	-	-	-	(1)	-	-	-	2

*** Mandatory courses conducted outside the regular working hours.**

Total number of Hours = 180

Total number of Compulsory Credits = 140+10

***Non academic courses are mandatory**

*** Skill development programme a mandatory course for 60 hrs is offered in the I year for all the students.**

Courses offered for B.Sc Chemistry programme

Semester	Course	Course code	Title of the course	Hours /week	Credits
I	**Part I**	TL2011/ FL2011	Language	6	4
	Part II	GE2011	General English	6	4
	Part III	CC2011	Major Core I : General Chemistry - I	4	4
		CC20P1	Major Practical I : Volumetric Analysis and Inorganic Preparation	2	-
		CA2011	Allied I Theory: Chemistry for Life Sciences	4	3
		CA20P1	Allied I Practical :Volumetric and Organic Analysis	2	-
	Part IV	APS201	Add on course I : Professional English for physical sciences	2	2
		CNM201	Non Major Elective (NME) :Applied Chemistry - I	2	2
		SEC201/ SEC202	Meditation and Exercise/ Computer Literacy	2	2
	Part V	FCV201	Foundation course I : Values for Life	-	-
		STP201	STP - Clubs & Committees / NSS	-	-
II	**Part I**	TL2021/ FL2021	Language	6	4
	Part II	GE2021	General English	6	4
	Part III	CC2021	Major Core II : General Chemistry - II	4	4
		CC20P1	Major Practical I : Volumetric Analysis and Inorganic Preparation	2	2
		CA2021	Allied I Theory: Chemistry of Biomolecules	4	3
		CA20P1	Allied I Practical : Volumetric and Organic Analysis	2	2
	Part IV	APS202	Add on course II : Professional English for physical sciences	2	2
		CNM202	Non Major Elective (NME) :Applied Chemistry - II	2	2
		SEC201/ SEC202	Meditation and Exercise / Computer Literacy	2	2
	Part V	FCV201	Foundation course I : Values for Life	-	1
		SLP201	Service Learning Programme (SLP) : Community Engagement Course	-	2
		STP201	STP : Clubs & Committees / NSS	-	-
	Part I	TL2031/ FL2031	Language	6	4
	Part II	GE2031	General English	6	4
	Part III	CC2031	Major Core III : General Chemistry - III	4	4

III		CC2032	Major Elective : I a. Pharmaceutical Chemistry	4	3
		CC2033	Major Elective : I b. Nano and Polymer Chemistry		
		CC2034	Major Elective : I c. Applied Electro Chemistry		
		CC20P2	Major Practical II : Semi micro inorganic mixture analysis	2	-
		CA2031	Allied II Theory: Inorganic and Physical Chemistry	4	3
		CA20P1	Allied II Practical : Volumetric and Organic Analysis	2	-
	Part IV	APS203	Add on Course III : Professional English for physical sciences	2	2
	Part V	FCV202	Foundation course II :Personality Development	-	-
		SLP202	Service Learning Programme (SLP) : Extension activity (RUN)	-	-
		STP201	STP - Clubs & Committees / NSS	-	-
IV	**Part I**	TL2041/ FL2041	Language	6	4
	Part II	GE204	General English	6	4
	Part III	CC2041	Major Core IV : General Chemistry - IV	4	4
		CC2042	Major Elective : II a. Green Chemistry	4	3
		CC2043	Major Elective : II b. Forensic Chemistry		
		CC2044	Major Elective : II c. Instrumental Methods of Analysis		
		CC20P2	Major Practical II : Semi micro inorganic mixture analysis	2	2
		CA2041	Allied II Theory: Physical Chemistry	4	3
		CA20P1	Allied II Practical : Volumetric and Organic Analysis	2	2
	Part IV	APS204	Add on course IV : Professional English for physical sciences	2	2
	Part V	FCV202	Foundation course II : Personality Development	-	1
		SLP202	Service Learning Programme (SLP) : Extension activity (RUN)	-	2
		STP201	STP : Clubs & Committees / NSS	-	2
V	**Part III**	CC2051	Major Core V : Organic Chemistry - I	5	5
		CC2052	Major Core VI : Inorganic Chemistry - I	5	5
		CC2053	Major Core VII : Physical Chemistry - I	6	6
		CC2054	Major Elective : III a Bio Chemistry	4	3
		CC2055	Major Elective : III b Dairy Chemistry		
		CC2056	Major Elective : III c Analytical Chemistry		
		CC20P3	Major Practical III : Gravimetric estimation and Organic preparation	3	-
		CC20P4	Major Practical IV: Organic estimation ,organic analysis and determination of physical constants	3	-

		CC20P5	Major Practical V : Physical Chemistry Experiments	2	-
	Part IV	AEC201	Ability Enhancement Course (AEC) : Environmental studies	2	2
	Part V	FCV203	Foundation course III : Human Rights Education	-	1
VI	**Part III**	CC2061	Major Core VIII : Organic Chemistry - II	6	6
		CC2062	Major Core IX : Inorganic Chemistry -II	5	5
		CC2063	Major Core X : Physical Chemistry - II	5	5
		CC20PR	Major Core : Project	4	3
		CC20P3	Major Practical III : Gravimetric estimation and Organic preparation	3	3
		CC20P4	Major Practical IV : Organic estimation ,organic analysis and determination of physical constants	3	3
		CC20P5	Major Practical V : Physical chemistry experiments	2	2
	Part IV	SEC203	Chemistry for competitive examinations	2	2
	Part V	FCV204	Foundation course IV :Gender equity studies	-	1
			TOTAL	**180**	**150**

Self Learning Courses – Extra Credit Courses

Semester	Course code	Title of the paper	Credits
III/V	CC20S1	Soil Science and Agricultural Chemistry	2
IV/ VI	CC20S2	Chemistry of Cosmetics	2
III - VI		Online course : SWAYAM / NPTEL	2

Value Added Courses

(Any two courses can be offered)

S. No.	Course code	Title of the course	Total hours
I	VAC201	Food Science	30
II	VAC202	Chemicals of everyday use	30
III	VAC203	Clinical chemistry	30
IV	VAC204	Dairy chemistry	30

- All the theory and the practicals for major and allied carry 100 marks each
- Practical examinations will be conducted at the end of even semesters
- Project viva will be conducted at the end of VI semester

Semester - I

Major Core I : GENERAL CHEMISTRY - I

Course Code: CC2011

Hours Per week	Credits	Total Hours	Marks
4	4	60	100

Course Outcome

CO	*Upon completion of this course, students will be able to*	PSO Addressed	Cognitive Level
CO - 1	understand the structure and naming of various organic compounds	PSO-1	U
CO - 2	interpret various electronic effects and chemical bonding	PSO-3	An
CO - 3	analyse the periodic properties of elements	PSO-2	An
CO - 4	apply wave mechanical concept in other fields	PSO-6	A
CO - 5	predict the properties of elements and the principle behind volumetric analysis	PSO-6	An

Semester I

Allied Chemistry - Botany and Zoology Major

Chemistry for Life Sciences

Course Code: CA2011

Hours Per week	Credits	Total Hours	Marks
4	**3**	**60**	**100**

Course Outcome

CO	*Upon completion of this course, the students will be able to*:	PSO Addressed	Cognitive Level
CO-1	remember the structure and bonding in atoms and molecules	PSO-1	R
CO-2	analyse the types of bonding and the ways of expressing concentration in molecules	PSO-2	An
CO-2	understand the concepts of biophysical analysis, catalysis and buffer action	PSO-1	U
CO-3	apply the concepts of photochemistry and chromatography to various chemical processes.	PSO-6	A

Semester - I

Part IV: NME

Applied Chemistry - I

Course Code: CNM201

Hours Per week	Credits	Total Hours	Marks
2	2	30	100

Course Outcome

CO	*Upon completion of this course, the students will be able to*:	PSO Addressed	Cognitive Level
CO-1	remember the importance of soaps and detergents	PSO-2	R
CO-2	analyse the characteristics and advantages of agrochemicals	PSO-2	An
CO-2	understand the process of manufacture of sugar and paper	PSO-4	U
CO-3	apply the chemical reactions to synthesize day to day articles	PSO-4	A

Semester - II

Major Core II : General Chemistry - II

Course Code: CC2021

Hours Per week	Credits	Total Hours	Marks
4	4	60	100

Course Outcome

CO	*Upon completion of this course, students will be able to*	PSO Addressed	Cognitive Level
CO - 1	understand the preparation, properties of chemical compounds	PSO-1	U
CO - 2	apply the theories in the preparation of compounds	PSO-6	A
CO - 3	predict the type of bonding and geometry of chemical compounds	PSO-3	An
CO - 4	learn the basics of metallurgy and the theories about gases	PSO-1	U
CO - 5	analyse the properties of matter	PSO-2	An

Semester - II

Major Practical Paper I : Volumetric Analysis and Inorganic Complex Preparation

Course Code: CC20P1

Hours Per week	Credits	Total Hours	Marks
2	4	60	100

Learning Outcome

LO	*Upon completion of course students will be able to*
LO - 1	understand the concepts of quantitative analysis
LO - 2	recognize the indicators, acid and bases used in volumetric analysis
LO - 3	develop practical skill
LO - 4	utilize the mathematical skills doing calculation
LO - 5	employ suitable methods to minimize errors

Semester II

Allied Chemistry - Botany and Zoology Major

Chemistry of Biomolecules

Course Code: CA2021

Hours Per week	Credits	Total Hours	Marks
4	**3**	**60**	**100**

Course Outcome

CO	*Upon completion of this course, the students will be able to*:	PSO Addressed	Cognitive Level
CO-1	remember the classification of biomolecules	PSO-1	R
CO-2	understand the structure, function and metabolism of biomolecules	PSO-1	U
CO-3	apply the chemistry of biomolecules in industry and medicine	PSO-6	A
CO-4	analyse and identify biomolecules	PSO-2	An

Semester – II & IV

Allied Chemistry Practical : Volumetric and Organic Substance Analysis

Course Code: CA20P1

Hours Per week	Credits	Total Hours	Marks
2	4	30	100

Learning Outcome

LO	*Upon Completion of this course students will be able to:*
LO - 1	recognize the indicators used in volumetric analysis
LO - 2	estimate the amount of substance present in the sample solution
LO - 3	develop practical skills
LO - 4	understand and remember the concepts and theory of qualitative and quantitative analysis
LO - 5	utilizing the mathematical skills in doing calculations
LO - 6	employ suitable methods to minimize errors

Semester - II

Part – IV NME

Applied Chemistry - II

Course Code: CNM202

Hours Per week	Credits	Total Hours	Marks
2	2	30	100

Course Outcome

CO	*Upon completion of this course, the students will be able to*:	PSO Addressed	Cognitive Level
CO-1	remember the refining of petroleum and manufacture of petroleum products	PSO-4	R
CO-2	analyse the therapeutic uses of pharmaceuticals	PSO-7	An
CO-2	understand the process of manufacture of cosmetics and perfumes	PSO-8	U
CO-3	analyse the characteristics of matches ,explosives, paints and pigments	PSO-2	An

Semester - III
Major Core III: General Chemistry III
Course Code: CC2031

Hours per Week	Credits	Total hours	Marks
4	4	60	100

Course Outcome

CO	*Upon completion of this course, the students will be able to*:	PSO addressed	Cognitive level
CO - 1	gain knowledge on aromatic compounds	PSO -1	U
CO - 2	synthesise aromatic compounds	PSO -4	Ap
CO - 3	remember the characteristics of group 13 and 14 elements	PSO -2	U
CO - 4	predict the chemistry of nitrogen and oxygen family	PSO -2	E
CO - 5	to understand the different colloidal systems	PSO -1	Ap
CO - 6	explain the various photochemical processses	PSO -1	U

Semester - III

Major Elective I a– Pharmaceutical Chemistry

Course Code: CC2032

Hours / Week	Credits	Total hours	Marks
4	3	60	100

Course Outcome

CO	*Upon completion of this course, the students will be able to*:	PSO addressed	Cognitive level
CO-1	understand the characteristics, classification and sources of drugs	PSO-1	U
CO-2	interpret the chemical structure and pharmacological activities of drugs	PSO-3	E
CO-3	compare the action of various drugs	PSO-2	An
CO-4	design common drugs and interpret their therapeutic uses	PSO-5	Ap
CO-5	identify common diseases, their causes and treatment	PSO-2	An

Semester - III

Major Elective I b – Nano and Polymer Chemistry

Course Code: CC2033

Hours / Week	Credits	Total hours	Marks
4	3	60	100

Course Outcome

CO	*Upon completion of this course, the students will be able to*:	PSO addressed	Cognitive level
CO - 1	apply the uses of nanomaterials in industrial and medicinal field	PSO -2	A
CO - 2	know the different characterization techniques of nanomaterials	PSO -5	U
CO - 3	classify the types of polymers and learn the kinetics of polymers	PSO -1	E
CO - 4	understand the principles of polymer reactivity and stereo chemistry of polymerization	PSO -1	U
CO - 5	analyse the special features of commercial polymers	PSO -2	An

Semester - III

Elective I c - Applied Electro Chemistry

Course Code: CC2034

Hours per Week	Credits	Total hours	Marks
4	3	60	100

Course Outcome

CO	Upon completion of this course, the students will be able to:	PSO addressed	Cognitive level
CO - 1	understand the basic principles involved in the electrolysis	PSO - 1	U
CO - 2	differentiate between electrometallurgy and hydrometallurgy	PSO - 2	An
CO - 3	interpret the different methods of electroplating	PSO - 3	Ap
CO - 4	compare the different power sources	PSO - 8	E
CO - 5	predict corrosion and types of coating	PSO - 6	C
CO - 6	explain the special features of electro –organic synthesis	PSO - 1	U

Allied II: Chemistry for Physics Major
Semester III
Inorganic and Physical Chemistry
Course Code: CA2031

Hours per week	Credit	Total hours	Marks
4	**3**	**60**	**100**

Course Outcome

CO	*Upon completion of this course, the students will be able to*:	PSO addressed	Cognitive level
CO-1	remember the structure and bonding in atoms and molecules	PSO-1	R
CO-2	know about different types of bonding	PSO-2	An
CO-2	understand the metallurgical processes and the methods of purification of metals	PSO-6	A
CO-3	understand the concepts of solid state chemistry and nuclear chemistry	PSO-1	U

Semester - IV
Major Core IV: General Chemistry IV
Course Code: CC2041

Hours per week	Credits	Total hours	Marks
4	4	60	100

Course outcome

CO	Upon completion of this course, the students will be able to:	PSO addressed	Cognitive level
CO - 1	know the mechanism of important name reactions	PSO - 1	U
CO - 2	apply the reaction mechanisms in the synthesis of components used in industrial and medicinal fields	PSO - 2	An
CO - 3	evaluate the characteristics of halogens and noble gases	PSO - 3	E
CO - 4	classify the non aqueous solvents and know the theories of acids and bases	PSO - 3	E
CO - 5	list out the applications of first and second law of thermodynamics	PSO - 3	R

Semester – IV

Major Elective II a - Green Chemistry

Course Code: CC2042

Hours per week	Credits	Total hours	Marks
4	3	60	100

Course outcome

CO	Upon completion of this course, the students will be able to:	PSO addressed	Cognitive level
CO - 1	know the principles of green chemistry	PSO - 1	R
CO - 2	design green synthesis	PSO - 5	C
CO - 3	interpret green method for organic synthesis	PSO - 3	E
CO - 4	synthesize various compounds by microwave and ultrasound assisted methods	PSO - 4	C
CO - 5	analyze the important techniques and directions in practicing green chemistry	PSO - 2	An
CO - 6	identify the importance of Green chemistry in day to day life	PSO - 8	Ap

Semester –IV

Major Elective II b – Forensic Chemistry

Course Code: CC2043

Hours per week	Credits	Total hours	Marks
4	3	60	100

Course Outcome

CO	Upon completion of this course, the students will be able to:	PSO addressed	Cognitive level
CO - 1	list out the principles governing forensic science	PSO - 1	U
CO - 2	differentiate toxic chemicals	PSO - 2	An
CO - 3	create mobile forensic science laboratories	PSO - 5	C
CO - 4	categorize physical evidence	PSO - 2	An
CO - 5	predict the methods used for the collection of finger prints	PSO - 3	E
CO - 6	distinguish the cordage and rope metallic fragments	PSO - 3	E

Semester IV

Major Elective II c : Instrumental Methods of Analysis

Course Code: CC2044

Hours per week	Credits	Total hours	Marks
4	3	60	100

Course Outcome

CO	*Upon completion of this course, the students will be able to*:	PSO addressed	Cognitive level
CO - 1	recognize the principles of adsorption	PSO – 1	U
CO - 2	choose specific adsorbents for chemical reaction	PSO – 2	An
CO - 3	analyze the factors affecting chromatography	PSO – 2	An
CO - 4	categorize the different analytical methods	PSO – 3	E
CO - 5	evaluate λ_{max} for organic compounds	PSO – 5	E
CO - 6	to understand the concept of flame photometry	PSO – 1	U
CO - 7	apply IR spectroscopy to identify functional groups	PSO - 8	Ap

Allied II Chemistry for Physics Major

Semester IV

Physical Chemistry

Course Code: CA2032

Hours per week	Credits	Total hours	Marks
4	**3**	**60**	**100**

Course Outcome

CO	*Upon completion of this course, the students will be able to*:	PSO addressed	Cognitive level
CO-1	remember the theories and the factors influencing rate of reaction	PSO-1	R
CO-2	understand the laws and theories that govern photochemistry	PSO-1	U
CO-3	apply the principles of physical properties for structural determination	PSO-6	A
CO-4	understand the different laws of thermodynamics	PSO-1	U
CO-5	analyse the importance of nano chemistry in various fields	PSO-2	An

Semester III & IV

Major Practical II

Semi micro inorganic mixture analysis

Course Code: CC20P2

Hours per week	Credits	Total hours	Marks
2	2	30	100

Learning Outcome

CO	Upon completion of this practical the students will be able to	PSO	CL
CO - 1	understand the principles of qualitative analysis	PSO - 1	U
CO - 2	to detect the different anions	PSO - 5	An
CO - 3	to eliminate the interfering anions	PSO - 5	E
CO - 4	to detect the different cations	PSO - 5	E

Semester – III & IV

Allied II : Practical

Volumetric and Organic Analysis

Course Code: CA20P1

Hours per week	Credits	Total hours	Marks
2	2	30	100

Learning Outcome

LO	Upon completion of this practical the students will be able to	PSO	CL
CO - 1	recognize the indicators used in volumetric analysis	PSO - 1	U
CO - 2	estimate the amount of substance present in the sample solution	PSO - 4	E
CO - 3	develop practical skills	PSO - 7	E
CO - 4	understand and remember the concepts and theory of qualitative and quantitative analysis	PSO - 1	U
CO - 5	utilizing the mathematical skills in doing calculations	PSO - 5	Ap
CO - 6	employ suitable methods to minimize errors	PSO - 5	Ap

V SEMESTER

Core V: ORGANIC CHEMISTRY- I
Course code : CC2051

Hours Per week	Credits	Total hours	Marks
5	5	75	100

Course Outcome

CO - No.	Upon completion of course students will be able to	PSO	CL
CO - 1	understand the concept of optical activity, stereoisomerism and stereo isomers.	PSO-1	U
CO - 2	remember the preparation and synthesis of carbonyl, Nitrogen containing and heterocyclic compounds.	PSO-4	R
CO - 3	apply the synthetic methods to synthesize new compounds	PSO-4	A
CO - 4	analyze the synthetic importance of different organic compounds	PSO-2	An
CO - 5	create alternate routes to prepare new compounds.	PSO-5	C

V SEMESTER
Core VI: INOORGANIC CHEMISTRY I
Course code : CC2052

Hours per week	Credits	Total hours	Marks
5	5	75	100

Course Outcome

CO - No.	Upon completion of the course students will be able to	PSO	CL
CO - 1	acquire knowledge on transition and inner transition elements	PSO – 1	U
CO - 2	name co-ordination compounds	PSO – 5	A
CO - 3	analyse the nature of bonding in co-ordination and organometallic compounds	PSO – 2	An
CO - 4	predict the geometry and colourand spin of co-ordination compounds	PSO – 4	E
CO – 5	minimize the errors in chemical analysis	PSO – 2	An

V SEMESTER

Core VII: PHYSICAL CHEMISTRY

Course code: CC2053

Hours per week	Credits	Total hours	Marks
6	5	90	100

Objectives:

- To know the concepts of conductance , strong and weak electrolytes
- To understand the working of electro chemical cells, EMF measurement and their applications
- To learn the basic principles and applications of spectroscopy

Course Outcome

CO - No.	Upon completion of the course, students will be able to	PSO	CL
CO - 1	understand the basic principles of electrochemistry	PSO - 1	U
CO - 2	apply EMF measurements in different fields of chemistry	PSO - 2	A
CO - 3	analyzethe working of electrical appliances in day to day life	PSO - 5	An
CO - 4	remember the principle and applications of the different spectral techniques	PSO - 7	R
CO - 5	interpret the IR,NMR and ESR spectra of simple molecules	PSO - 3	E

V Semester
Elective IIIa : Bio Chemistry
Course Code: CC2054

Hours per week	Credits	Total hours	Marks
4	3	60	100

Course Outcome

CO. No.	Upon completion of course the students will be able to	PSO	CL
CO - 1	understand the function and metabolism of biomolecules	PSO – 1	U
CO - 2	recall the importance of biomolecules	PSO – 3	R
CO - 3	compare DNA and RNA	PSO - 5	An
CO - 4	elucidate the structure of different biomolecules	PSO – 2	A
CO - 5	illustrate the industrial and medical applications of enzymes	PSO - 8	U

V Semester

Elective III b - Dairy Chemistry

Course Code: CC2055

Hours per week	Credits	Total Hours	Marks
4	3	60	100

Course Outcome

CO - No.	Upon completion of course the students will be able to	PSO	CL
CO - 1	recall the physical properties of milk	PSO - 2	An
CO - 2	identify the various factors affecting the quality of milk	PSO - 11	U
CO - 3	analyse the microbiology of milk	PSO - 12	An
CO - 4	propose various methods to pasteurize milk	PSO - 12	C
CO - 5	apply the techniques to manufacture special milks	PSO - 8	Ap
CO - 6	estimate the acidity, lactose fat and protein content of milk	PSO - 2	An

V Semester
Major Elective : III c Analytical Chemistry

Course Code: CC2056

Hours per week	Credits	Total Hours	Marks
4	3	60	100

Course Outcome

CO - No.	Upon completion of course the students will be able to	PSO	CL
CO - 1	develop skills in handling instruments and reagents	PSO - 7	E
CO - 2	learn the concepts of precipitation techniques and related analysis	PSO -1	U
CO - 3	minimize errors and get results with maximum accuracy	PSO -6	An
CO - 4	apply different chromatographic techniques for separation	PSO - 2	Ap

Semester V
Ability Enhancement Course
Environmental Studies
Course Code: AEC201

Hours per Week	Credits	Total Hours	Marks
2	2	30	100

Course outcome

CO	Upon completion of this course the students will be ableto:	CL
CO - 1	understand the multidisciplinary nature of environmental studies	U
CO - 2	recall the components of different ecosystems	R
CO - 3	interpret the levels of diversity and its conservation	A
CO - 4	analyze the impact of population, pollution and disasters	An

VI SEMESTER
Core VIII: ORGANIC CHEMISTRY - II
COURSE CODE : CC2061

Hours per week	Credits	Total hours	Marks
6	5	90	100

Course Outcome

CO - No.	Upon completion of course the students will be able to	PSO -	CL
CO - 1	understand the synthetic methodology, reagents and rearrangements in organic chemistry	PSO-1	U
CO - 2	elucidate the structure of carbohydrates, alkaloids and terpenoids	PSO-6	C
CO - 3	synthesize dyes and compounds of synthetic importance	PSO-4	A
CO - 4	analysethe strategies and terminologies involved in organic synthesis leading to new products	PSO-5	An
CO - 5	apply the spectral techniques in structural determination	PSO-6	A

VI Semester
Core IX: Inorganic Chemistry II
Course Code: CC2062

Hours per week	Number of Credit	Total Hours	Marks
5	5	75	100

Course Outcome

CO. No.	Upon completion of course the students will be able to	PSO	CL
CO - 1	understand the types of nuclear reactions and their applications	PSO - 1	U
CO - 2	differentiate natural and artificial radioactivity	PSO - 2	An
CO - 3	classify crystal systems and their structures	PSO - 1	An
CO - 4	predict the role of bioinorganic compounds in biological systems	PSO - 2	A
CO - 5	use the solid materials for specific purposes	PSO - 6	A

VI SEMESTER

Core XI: PHYSICAL CHEMISTRY

Course Code: CC2063

Hours per week	Credits	Total hours	Marks
5	5	90	100

Course Outcome

CO - No.	Upon completion of the course, students will be able to	PSO	CL
CO - 1	understand the theories of reaction rate, adsorption and catalysis	PSO - 1	U
CO - 2	construct phase diagrams for one and two component systems	PSO - 3	C
CO - 3	recall colligative properties and their applications	PSO - 2	R
CO - 4	predict the point groups of molecules	PSO - 3	E
CO - 5	construct group multiplication table for simple molecules	PSO - 7	C

V Semester

Core Project

Course Code: CC20PR

Hours Per week	Credits	Total hours	Marks
4	3	60	100

Project and Viva-voce

Semester - V &VI

Major Practical III

Gravimetric estimation and organicpreparation

Course Code: CC20P3

Hours per week	Credits	Total hours	Marks
3	3	45	100

Course Outcome

CO - No.	Upon completion of course students will be able to	PSO	CL
CO - 1	develop skill in doing gravimetric estimation	PSO - 7	C
CO - 2	minimize errors for accurate results	PSO - 5	A
CO - 3	prepare new organic compounds	PSO – 5	Ap

Semester V&VI

Major Practical IV

Organic estimation, organic analysis and determination of physical constants

Course Code: CC20P4

Hours per week	Credits	Total hours	Marks
3	3	45	100

Course Outcome

CO - No.	Upon completion of course the students will be able to	PSO	CL
CO - 1	understand the principles of estimation of organic compounds	PSO - 1	U
CO - 2	Apply the scheme of organic analysis to detect functional groups	PSO - 5	An
CO - 3	Determine the physical constants of organic compounds with maximum accuracy	PSO - 5	E

Semester V&VI

Major Practical V

Physical Chemistry Experiments

Course Code: CC20P5

Hours per week	Credits	Total hours	Marks
2	2	30	100

Course Outcome

CO - No.	Upon completion of course the students will be able to	PSO	CL
CO - 1	understand the principles of physical chemistry experiments	PSO - 1	U
CO - 2	interpret the graphical data	PSO - 3	An
CO - 3	develop the practical skill and minimize errors	PSO - 7	C
CO - 4	determine and compare the strengths of different solutions using physical methods	PSO - 2	E