

COURSE CURRICULUM FRAMEWORK UNDER AUTONOMY

Program: M.Sc. Physical Chemistry

Department: Chemistry

Semester I		
Course code	Course Title	Credits
	Title of Course List of Titles of units of the Course	
PSCHE101	Physical Chemistry-I Chemical Thermodynamics-I Quantum Chemistry-I Chemical Dynamics-I Electrochemistry	4
PSCHE102	Inorganic Chemistry-I Chemical Bonding Molecular Symmetry and Group Theory Environmental Chemistry Characterisation of Coordination compounds	4
PSCHE103	Organic Chemistry-I Physical Organic Chemistry Nucleophilic substitution reactions and Aromaticity Stereochemistry of Organic Compounds Oxidation and Reduction	4
PSCHE104	Analytical Chemistry-I Language of Analytical Chemistry Calculations based on Chemical Principles Optical Methods X-ray spectroscopy	4
PSCHEPR101	Physical Chemistry Practical-I	2
PSCHEPR102	Inorganic Chemistry Practical-I	2
PSCHEPR103	Organic Chemistry Practical-I	2
PSCHEPR104	Analytical Chemistry Practical-I	2

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Semester II		
Course code	Course Title	Credits
	Title of Course List of Titles of units of the Course	
PSCHE201	Physical Chemistry-II Chemical Thermodynamics II Quantum Chemistry II Chemical Kinetics & Molecular Reaction Dynamics Solid State Chemistry & Phase Equilibria	4
PSCHE202	Inorganic Chemistry-II Inorganic Reaction Mechanism Organometallic Chemistry of Transition Metals Introduction to Nanomaterials & Nanotechnology	4
PSCHE203	Organic Chemistry-II Enols and Enolates Name Reactions & Rearrangements Molecular Orbital Theory & Photochemistry Organic Spectroscopy	4
PSCHE204	Analytical Chemistry-II Chromatography Thermal Methods, Hyphenation & Automation in Chemical Analysis Surface Analytical Techniques Electroanalytical Methods	4
PSCHEPR201	Physical Chemistry Practical-II	2
PSCHEPR202	Inorganic Chemistry Practical-II	2
PSCHEPR203	Organic Chemistry Practical-II	2
PSCHEPR204	Analytical Chemistry Practical-II	2

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Semester III		
Course code	Course Title	Credits
PSCHE1301	Thermodynamics, Electrochemistry & Polymers Statistical Mechanics Electrochemistry: Introduction & Overview of Electrode Processes Polymer Chemistry-I Polymer Chemistry-II	4
PSCHE1302	Atomic, Molecular Structure & Spectroscopy Atomic Structure & Spectroscopy Molecular Structure & Electronic Spectroscopy Molecular Spectroscopy I Molecular Spectroscopy II	4
PSCHE1303	Nanochemistry and Nanotechnology Introduction to Nanomaterials and Nanotechnology Advanced Characterization of Nanomaterials Applications of Nanomaterials Environmental Nanotechnology	4
PSCHE1304	Application of Materials & Nuclear Chemistry Metals and alloys Mechanical properties of Solid Materials Lasers and superconductors Nuclear Chemistry	4
PSCHEP1301	Practical Coursework I	4
PSCHEP1302	Practical Coursework II	4
PSCHEP1303	Research Methodology	4
PSCHEP1304	Literature Review Literature survey, review writing and presentation	4

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Semester IV		
Course code	Course Title	Credits
PSCHE1401	Thermodynamics, Surface and Biophysical Non-equilibrium thermodynamics, Voltammetric methods, surface and interfacial chemistry & physical chemistry of biomolecules	4
PSCHE1402	Solid State Chemistry Solid state- structure, properties and synthesis; defects and non-stoichiometry, electrical, magnetic, thermal and optical properties of solids	4
PSCHE1403	Photochemistry and Advanced Spectroscopy Photochemistry and photocatalysis, fluorescence phenomenon and its applications, advanced techniques in NMR spectroscopy & mass spectrometry	4
PSCHE1404	Materials, Devices and Computational Chemistry Solar photovoltaics, batteries and supercapacitors, organic electronic and photonic materials, Intellectual Property Rights & Chemoinformatics	4
PSCHEP1401	Practical Coursework III	2
PSCHEP1402	Practical Coursework IV	2
PSCHEP1403	Spectral Interpretation Interpretation of uv/IR/NMR/Mass/XRD spectra and its analysis	2
PSCHEP1404	Research Project Short-term research project culminating in a dissertation and presentation of the work done.	2