DEPARTMENT OF CHEMISTRY (UG & PG)
JHARGRAM RAJ COLLEGE, JHARGRAM
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Syllabus distribution for the Academic Session 2022-2023

CLASS	PAPER	TOPIC	UNIT	FACULTY ASSIGNED
UG SEMESTER – I (HONOURS)	C1T	Bonding and Physical Properties	I	TA, AB
		General Treatment of Reaction Mechanism I	II	AB
		Stereochemistry I	III	SM
	C1P	Organic Chemistry lab I	N/A	SM
	C2T	Kinetic Theory and Gaseous state	I	PG
		Chemical Thermodynamics	II	NKB
		Chemical kinetics	III	NKB
	C2P	Physical Chemistry lab I	N/A	PG
	GE1T	Atomic Structure	I	TM
		Chemical Periodicity	II	SA
		Acids and bases	III	SA
		Redox reactions	IV	TM
		Fundamentals of Organic Chemistry	V	AB
		Stereochemistry	VI	SM
		Nucleophilic Substitution and Elimination Reactions	VII	AB
		Aliphatic Hydrocarbons	VIII	PP
	GE1P	Inorganic Chemistry lab	I	TM, SA
		Organic Chemistry lab	II	SM
UG SEMESTER – I (GENERAL)	DSC1AT	Atomic Structure	I	TM
		Chemical Bonding and Molecular Structure	II	SA
		Fundamentals of Organic Chemistry	III	TA
		Stereochemistry	IV	TA
		Aliphatic Hydrocarbons	V	PP
	DSC1AP	Inorganic Chemistry lab (Volumetric Analysis)	I	TM, SA
		Organic Chemistry lab	II	TA, PP
PG SEMESTER – I	CEM 101	Mathematical Preliminaries and Quantum Mechanics-I	I	NKB
		Thermodynamics	II	PG
		Statistical Mechanics - I	III	NKB
		Rotational Spectroscopy	IV	PG
		Vibrational Spectroscopy	V	PG
	CEM 102	Pericyclic reaction I	I	TA
		Organic transformations/ Reagent Chemistry/Synthesis-I:	II	AB
		Natural products-Terpenoids:	III	DR
		Natural Products - Alkaloids:	IV	DR
		Retrosynthetic analysis-I	V	SM
	CEM 103	Symmetry and Group theory-I	I	NKB, SA
		Solid state Chemistry and crystallography	II	TM, PG
		Bioinorganic chemistry-I	III	TM
	CEM 104	Constituents of Food	I	PP
		Introduction to food microbiology	II	PP
		Food preservation	III	PP
		Computer Basics-I	IV	SS
		Computer Basics-II	V	SS
	CEM 195	Inorganic Chemistry lab (Practical)	N/A	TM, SA
	CEM 196	Food Processing, preservation & packaging lab (Practical)	N/A	DR, SM

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CLASS	PAPER	TOPIC	UNIT	FACULTY ASSIGNED
UG SEMESTER – II (HONOURS)	C3T	Extra nuclear Structure of atom	I	NKB
		Chemical periodicity	II	TM
		Acid-Base reactions	III	TM
		Redox Reactions and precipitation reactions	IV	SA
	C3P	Inorganic Chemistry lab I	N/A	SA, TM
	C4T	Stereochemistry II	I	SM
		General Treatment of Reaction Mechanism II	II	DR, AB, TA
		Substitution and Elimination Reactions	III	AB
	C4P	Organic Chemistry lab II	N/A	SM, TA
	GE2T	Kinetic Theory of Gases and Real gases	I	NKB
		Liquids	II	NKB
		Solids	III	NKB
		Chemical Kinetics	IV	NKB
		Chemical Bonding and Molecular Structure	V	TM
		Comparative study of p-block elements	VI	SA
	GE2P	Inorganic and Physical Chemistry lab	N/A	PG, NKB, SA, TM
UG SEMESTER – II (GENERAL)	DSC1BT	Chemical Energetics	I	PG
		Chemical Equilibrium	II	PG
		Ionic Equilibria	III	PG
		Aromatic hydrocarbons	IV	SM
		Alkyl and Aryl Halides	V	SM
		Alcohols, Phenols and Ethers	VI	SM
		Ethers (aliphatic and aromatic)	VII	SM
		Aldehydes and ketones (aliphatic and aromatic)	VIII	SM
	DSC1BP	Physical Chemistry lab, Organic Chemistry lab	N/A	PG, SM
PG SEMESTER – II	CEM 201	Quantum Mechanics-II	I	NKB
		Chemical Kinetics-I	II	NKB
		Electrochemistry	III	PG
		Molecular Spectroscopy-II	IV	PG
		Surface Chemistry	V	PG, NKB
	CEM 202	Pericyclic reaction I	I	AB
		Organic transformations/ Reagent Chemistry/Synthesis-I	II	AB
		Stereochemistry I	III	SM
		Stereochemistry II	IV	SM
	CEM 203	Organometallic chemistry-I	I	TM
		Group theory-II	II	TM, SA
		Chemistry of p and d block elements	III	TM, SA
	CEM 204	Nanotechnology: Principles and Practices	I	TA
	CEM 295	Organic Chemistry Practical	N/A	SM
	CEM 296	Physical Chemistry Practical	N/A	NKB

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CLASS	PAPER	TOPIC	UNIT	FACULTY ASSIGNED
UG SEMESTER – III (HONOURS)	C5T	Transport processes	I	PG, NKB
		Applications of Thermodynamics – I	II	PG
		Foundation of Quantum Mechanics	III	NKB
	C5P	Physical Chemistry-II lab	N/A	NKB
	C6T	Chemical Bonding-I	I	SA
		Chemical Bonding-II	II	TM
		Radioactivity	III	SA
	C6P	Inorganic Chemistry-II lab	N/A	TM, SA
	C7T	Chemistry of alkenes and alkynes	I	DR
		Aromatic Substitution	II	SM
		Carbonyl and Related Compounds	III	AB
		Organometallics	IV	TA
	C7P	Qualitative Analysis of Single Solid Organic Compounds	N/A	AB, PP
	SEC1T	Drugs & Pharmaceuticals	I	PP, AB
		Fermentation	II	SM
	SEC1P	Pharmaceutical Chemistry	N/A	PP, AB, SM
UG SEMESTER – III (GENERAL)	DSC1CT	Solutions	I	NKB
		Phase Equilibrium	II	NKB
		Conductance	III	NKB
		Electrochemistry	IV	NKB
		Carboxylic acids and their derivatives	V	TA
		Amines and Diazonium Salts	VI	TA
		Amino Acids, Peptides and Proteins	VII	TA
		Carbohydrates	VIII	TA
	DSC1CP	Physical Chemistry lab	I	NKB, PG
		Organic Chemistry lab	II	TA
	SEC1T	Basic Analytical Chemistry		To be decided later
	SEC1P	Practical		To be decided later
PG SEMESTER – III	CEM 301	Photophysical processes	I	TM
		Laser and its applications	II	NKB
		EPR spectroscopy	III	TM
		PES and NQR spectroscopy	IV	TM, NKB
	PHYSICAL CHEMISTRY SPECIAL PAPER			
	CEM 302	Matrix mechanics	I	NKB
		Stationary perturbation theory	II	PG
		Semiclassical treatment of radiation-matter interaction	III	PG
		Group Theory and Quantum Mechanics	IV	NKB
		Semiempirical methods of Quantum Chemistry	V	PG
	CEM 303	Solid state chemistry-I	I	PG
		Solid state chemistry-II	II	PG
		Statistical mechanics-II	III	NKB
		Statistical mechanics-III	IV	NKB
		Non-equilibrium thermodynamics	V	NKB
	CEM 395	Project work	N/A	NKB, PG

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CLASS	PAPER	TOPIC	UNIT	FACULTY ASSIGNED
PG SEMESTER – III (CONTINUED)	INORGANIC CHEMISTRY SPECIAL PAPER			
	CEM 302	Organometallic chemistry–II and catalysis	I	SA
		Chemical applications of group theory	II	SA
	CEM 303	Bioinorganic chemistry-II	I	TM
		Inorganic photochemistry	II	TM
	CEM 395	Project work	N/A	TM, SA
	ORGANIC CHEMISTRY SPECIAL PAPER			
	CEM 302	Organometallic Chemistry	I	PP
		Pericyclic reaction III	II	AB
		Linear Free Energy Relationship-I	III	SM
		Linear Free Energy Relationship-II	IV	SM
	CEM 303	Bioorganic and Supramolecular Chemistry-I	I	TA
		Bioorganic and Supramolecular Chemistry-II	II	TA
		Bioorganic and Supramolecular Chemistry-III	III	TA
		Peptides and Nucleic acids	IV	SM
		Green Chemistry	V	DR
	CEM 395	Project work	N/A	DR, SM, PP, AB, TA
UG SEMESTER – IV (HONOURS)	C8T	Application of Thermodynamics – II	I	PG
		Electrical Properties of molecules	II	NKB, PG
		Quantum Chemistry	III	NKB, PG
	C8P	Physical Chemistry Lab	N/A	PG
	C9T	General Principles of Metallurgy	I	TM
		Chemistry of s and p Block Elements	II	TM
		Noble Gases	III	SA
		Inorganic Polymer	IV	SA
		Coordination Chemistry-I	V	TM
	C9P	Inorganic Chemistry Lab	N/A	TM, SA
	C10T	Nitrogen compounds	I	TA
		Rearrangements	II	AB
		The Logic of Organic Synthesis	III	SM
		Organic Spectroscopy	IV	DR
	C10P	Organic Chemistry Lab	N/A	AB
	SEC2T	Basic Analytical Chemistry	I	NKB, TM
	SEC2P	Practical	I	SA, TM
	GE4T	Solutions, Phase Equilibria, Conductance, Electrochemistry	I	PG
		Analytical and Environmental Chemistry	II	TM
	GE4P	Physical Chemistry Lab	I	PG
		Analytic and Environmental Chemistry Lab	II	TM

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CLASS	PAPER	TOPIC	UNIT	FACULTY ASSIGNED
UG SEMESTER – IV (GENERAL)	DSC1DT	Transition Elements (3d series)	I	TM
		Coordination Chemistry	II	TM
		Crystal Field Theory	III	TM
		Kinetic Theory of Gases	IV	PG
		Liquids	V	PG
		Solids	VI	PG
		Chemical Kinetics	VII	PG
	DSC1DP	Inorganic Chemistry lab	N/A	TM
		Physical Chemistry lab	N/A	PG
	SEC2T	Intellectual Property Rights (No laboratory)		TA
PG SEMESTER – IV	CEM 401	NMR spectroscopy I	I	DR
		NMR spectroscopy II	II	DR
		Mass spectroscopy	III	TM
		Combined applications of spectroscopic techniques	IV	NKB
		CD, ORD, MossBauer spectroscopy	V	TM
	PHYSICAL CHEMISTRY SPECIAL PAPER			
	CEM 402	Quantum mechanics of many electron systems I	I	PG
		Atomic Spectroscopy	II	NKB
		QM of diatomic molecules	III	PG
		QM of many-electron system-II	IV	PG
		Applications of perturbation theory	V	NKB
	CEM 403	Chemicals Kinetics-II	I	NKB
		Chemical Kinetics-III	II	NKB
		Macromolecules	III	NKB
		Biopolymers	IV	SM
		Advanced electrochemistry	V	PG
	CEM 495	Project work	N/A	NKB, PG
	INORGANIC CHEMISTRY SPECIAL PAPER			
	CEM 402	Magnetochemistry	I	TM
		Metal carbonyls and clusters	II	SA
	CEM 403	Inorganic reaction mechanism	I	SA
		Analytical chemistry	II	TM
	CEM 495	Project work	N/A	TM, SA
	ORGANIC CHEMISTRY SPECIAL PAPER			
	CEM 402	Organic Photochemistry-I	I	DR
		Organic Photochemistry-II	II	DR
		Biological Active Molecules	III	TA
		Vitamins and co-enzymes	IV	AB
	CEM 403	Stereochemistry-III	I	SM
		Stereochemistry-IV	II	AB
		Stereochemistry-V	III	AB
		Stereochemistry-VI	IV	SM
		Stereochemistry-VII	V	TA
	CEM 495	Project work	N/A	DR, SM, PP, AB, TA

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UG SEMESTER – V (HONOURS)	C11T	Coordination Chemistry-II	I	TM, SA
		Chemistry of d- and f- block elements	II	SA
		Transition Elements	III	SA
		Lanthanoids and Actinoids	IV	SA
	C11P	Inorganic Chemistry Lab	N/A	TM, SA
	C12T	Carbocycles and Heterocycles	I	AB
		Cyclic Stereochemistry	II	SM
		Pericyclic reactions	III	DR, TA
		Carbohydrates	IV	DR
		Biomolecules	V	SM, PP
	C12P	Organic Chemistry Lab	N/A	DR, PP
	DSE1T	Crystal Structure	I	PG
		Statistical Thermodynamics	II	NKB
	DSE1P	Advanced Physical Chemistry	N/A	PG
	DSE2T	Qualitative and quantitative aspects of analysis	I	NKB
		Optical methods of analysis:	II	NKB, TM
		Thermal methods of analysis	III	SA
		Electroanalytical methods	IV	NKB
		Separation techniques	V	PP, DR, NKB
	DSE2P	Analytical Methods in Chemistry	N/A	DR, PP, TM, SA
UG SEMESTER – V (GENERAL)	DSE1AT	Chemistry of 3d metals	I	TM
		Organometallic Compounds	II	TA
		Bio-inorganic Chemistry	III	SA
		Polynuclear and heteronuclear aromatic compounds	IV	AB
		Active methylene compounds	V	AB
		Application of Spectroscopy to Simple Organic Molecules	VI	DR
	DSE1AP	Practical	N/A	SM
	SEC3T	Pharmaceutical Chemistry	I	PP
	SEC3P	Practical	N/A	AB

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UG SEMESTER – VI (HONOURS)	C13T	Bioinorganic Chemistry	I	TM
		Organometallic Chemistry	II	SA, TM
		Catalysis by Organometallic Compounds	III	SA
		Reaction Kinetics and Mechanism	IV	TM
	C13P	Inorganic Chemistry lab	N/A	SA, TM
	C14T	Molecular Spectroscopy	I	NKB
		Photochemistry	II	NKB
		Surface phenomenon	III	PG
	C14P	Physical Chemistry lab	N/A	PG
	DSE3T	Green Chemistry	I	DR
	DSE3P	Green Chemistry Lab	N/A	DR, TA
	DSE4T	Introduction and history of polymeric materials		PG
		Functionality and its importance		SM
		Kinetics of Polymerization		PG
		Crystallization and crystallinity		PG
	DSE4P	Polymer Chemistry Lab	N/A	SM, PG
UG SEM – VI (GENERAL)	DSE2T	Green Chemistry: Introduction to Green Chemistry	I	DR
		Principles of Green Chemistry and Chemical synthesis	II	DR
		Green Synthesis/ Reactions and some real-world cases	III	DR
		Future Trends in Green Chemistry	IV	DR
	DSE2P	Green Chemistry lab	N/A	DR

DETAILS OF TEACHERS

INITIAL	FULL NAME	TEACHING AREA
TM	DR. TARUN MISTRI	INORGANIC CHEMISTRY
SA	SMT. SANCHAYITA ADIKARI	INORGANIC CHEMISTRY
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SM	DR. SUSOVAN MANDAL	ORGANIC CHEMISTRY
PP	DR. PRASANTA PATRA	ORGANIC CHEMISTRY
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