

**DEPARTMENT OF CHEMISTRY (UG & PG), JHARGRAM RAJ COLLEGE****LESSON PLAN (SESSION: 2022-2023)****TEACHER: DR. NABAKUMAR BERA (PHYSICAL CHEMISTRY)****UG SEMESTER-I****PAPER: CC-2T (PHYSICAL CHEMISTRY-I), Chemical Thermodynamics and Chemical Kinetics (40 Lectures)**

PERIOD	TOPIC(S) TO BE COVERED
October 2022	Introductions, Basic concepts and 1 st law of Thermodynamics , Thermochemistry
November 2022	2 nd Law of thermodynamics, Thermodynamic relations
December 2022	Chemical Kinetics
January 2022	Class test

PAPER: CC-3T (INORGANIC CHEMISTRY-I), Extra nuclear Structure of atom (20 Lectures)

PERIOD	TOPIC(S) TO BE COVERED
October 2022	Extranuclear Structure of Atoms
November 2022	Class test

PAPER: CC-2P (CHEMISTRY LAB-II) (Jointly with Dr. Pradipta Ghosh)

PERIOD	TOPIC(S) TO BE COVERED
November 2022	Experiment 1, Experiment 2
December 2022	Experiment 3, Experiment 4
January 2022	Experiment 5, Practice sessions

UG SEMESTER-II**PAPER: GE-2P (PHYSICAL CHEMISTRY LAB-I)**

PERIOD	TOPIC(S) TO BE COVERED
March 2023	Experiments on surface tension measurement (two experiments)
April 2023	Experiments on viscosity coefficient measurement (two experiments)
May 2023	Practice sessions

PAPER: DSC-1BT (CC-2) [FOR THE GENERAL COURSE]

PERIOD	TOPIC(S) TO BE COVERED
October 2022	Chemical Energetics (08 lectures)
November 2022	Chemical equilibrium (04 lectures)
December 2022	Ionic equilibria (06 lectures)
January 2022	Class test

PAPER: DSC-1BP (CC-2 LAB) [FOR THE GENERAL COURSE]

PERIOD	TOPIC(S) TO BE COVERED
October 2022	Experiments based on thermochemistry (Part-A: three experiments)
November 2022	Experiments based on thermochemistry (Part-B: three experiments)
December 2022	Experiments based on ionic equilibria (two experiments)
January 2022	Practice sessions

UG SEMESTER-III**PAPER: CC-5T (PHYSICAL CHEMISTRY-II), Foundation Quantum Mechanics (25 Lectures)**

PERIOD	TOPIC(S) TO BE COVERED
August 2022	Beginning of Quantum Mechanics
September 2022	Postulates of Quantum Mechanics: Wave functions and operators
October 2022	Applications of QM to simple systems such as PIAB and LSHO
November 2022	Class test

PAPER: GE-2P (PHYSICAL CHEMISTRY LAB-II) [jointly with Dr. Nabakumar Bera]



DEPARTMENT OF CHEMISTRY (UG & PG), JHARGRAM RAJ COLLEGE
LESSON PLAN (SESSION: 2022-2023)

PERIOD	TOPIC(S) TO BE COVERED
September 2022	Experiments on thermochemistry (Experiment 1, Experiment 2, Experiment 3)
October 2022	Experiments on ionic equilibria (Experiment 4, Experiment 5)
November 2022	Practice sessions

UG SEMESTER-IV

PAPER: CC-8T (PHYSICAL CHEMISTRY-III), Quantum Chemistry (20 Lectures)

PERIOD	TOPIC(S) TO BE COVERED
February 2023	Angular Momentum and Rigid Rotor
March 2023	Hydrogen Atom
April 2023	Variation Principle
May 2023	Polyelectron atoms and molecules

PAPER: CC-8P (PHYSICAL CHEMISTRY LAB-III) (With Dr. Pradipta Ghosh)

PERIOD	TOPIC(S) TO BE COVERED
February 2023	Experiment 1, Experiment 2
March 2023	Experiment 3, Experiment 4
April 2023	Experiment 5, Experiment 6
May 2023	Practice sessions

UG SEMESTER-V

PAPER: DSE-1T (ADVANCED PHYSICAL CHEMISTRY): Statistical Thermodynamics (20 Lectures)

PERIOD	TOPIC(S) TO BE COVERED
July 2022	Basic principle of Statistical Thermodynamics
August 2022	Lattice heat capacity
September 2022	Nernst heat theorem and third law of thermodynamics
October 2022	Class tests

UG SEMESTER-VI

PAPER: CC-14T (PHYSICAL CHEMISTRY-V): Molecular Spectroscopy and Photochemistry (30 Lectures)

PERIOD	TOPIC(S) TO BE COVERED
January 2023	Introduction, rotational and vibrational spectroscopy
February 2023	Electronic and Raman Spectroscopy
March 2023	NMR, EPR and Photochemistry
April 2023	Class Test

PAPER: CC-14P (PHYSICAL CHEMISTRY LAB-V): SURFACE PHENOMENON (10 Lectures) (With Dr. Pradipta Ghosh)

PERIOD	TOPIC(S) TO BE COVERED
January 2023	Experiment 1, Experiment 2, practice sessions
February 2023	Experiment 3, Experiment 4, practice sessions
March 2023	Experiment 5, Experiment 6, practice sessions

PG SEMESTER-I

PAPER: CEM 101 (PHYSICAL CHEMISTRY):

PERIOD	TOPIC(S) TO BE COVERED
October 2022	Mathematical Preliminaries
November 2022	Quantum Mechanics
December 2022	Statistical Mechanics



DEPARTMENT OF CHEMISTRY (UG & PG), JHARGRAM RAJ COLLEGE
LESSON PLAN (SESSION: 2022-2023)
PG SEMESTER-II

PAPER: CEM 201 (PHYSICAL CHEMISTRY):

PERIOD	TOPIC(S) TO BE COVERED
February 2023	Quantum Mechanics-2
March 2023	Chemical Kinetics
April 2023	Surface Chemistry

PG SEMESTER-II

PAPER: CEM 204 (PHYSICAL CHEMISTRY): Experiments

PERIOD	TOPIC(S) TO BE COVERED
February 2023	Conductometry and Potentiometry
March 2023	pH-metry and Spectrophotometry
April 2023	Polarimetry and Thermometry

PG SEMESTER-III

PAPER: CEM 302 (PHYSICAL CHEMISTRY SPECIALIZATION):

PERIOD	TOPIC(S) TO BE COVERED
September 2022	Matrix mechanics
October 2022	Group Theory
November 2022	Group Theory

PAPER: CEM 303 (PHYSICAL CHEMISTRY SPECIALIZATION):

PERIOD	TOPIC(S) TO BE COVERED
September 2022	Statistical Mechanics-2
October 2022	Statistical Mechanics-3
October 2022	Non-equilibrium Thermodynamics

PAPER: CEM 395 (PHYSICAL CHEMISTRY SPECIALIZATION):

PERIOD	TOPIC(S) TO BE COVERED
September 2022 – December 2022 (16 weeks)	Review work in an area of contemporary interest; research work to be performed; seminar Lecture has to be delivered on the total work carried out.

PG SEMESTER-IV

PAPER: CEM 402 (PHYSICAL CHEMISTRY SPECIALIZATION):

PERIOD	TOPIC(S) TO BE COVERED
February 2023	Atomic Spectroscopy
March 2023	Atomic Spectroscopy
April 2023	Atomic Spectroscopy

PAPER: CEM 403 (PHYSICAL CHEMISTRY SPECIALIZATION):

PERIOD	TOPIC(S) TO BE COVERED
February 2023	Chemical Kinetics-1
March 2023	Chemical Kinetics-2
April 2023	Advanced electrochemistry

PAPER: CEM 495 (PHYSICAL CHEMISTRY SPECIALIZATION):

PERIOD	TOPIC(S) TO BE COVERED
February 2023 – May 2023 (16 weeks)	Review work in an area of contemporary interest; research work to be performed; seminar Lecture has to be delivered on the total work carried out.