Gour Mohan Sachin Mandal Mahavidyalaya

Department of Chemistry
Evaluative Report

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ABOUT THE DEPARTMENT

History of the Department

Department of Chemistry was established in the year 2000. Chemistry as a subject of study was introduced as General Course level from 2000 and later in 2019, Honours in Chemistry was introduced. Students in Chemistry Honours started getting admission from the year 2020. Chemistry Department has contributed services to the community, by the way of providing basic and advanced facilities, particularly to the rural students.

VISION

- To stimulate the young minds and to produce capable chemistry graduates with highest professional standard, moral values and well-being to society.

MISSION

- To impart quality education through cutting-edge academic programmes.
- To advance the chemical sciences through the education of undergraduate students by providing them with quality classroom and laboratory facilities.
- To teach and train the students with updated knowledge and analytical skills.
- To implant sensitivity towards society and a respect for the environment.

PROGRAMS OFFERED

Programs offered	Crosscutting issues
Choice Based Credit system (CBCS)	▪ Introduction of Discipline specific courses like Molecular Modelling & Drug design, Applications of computers in chemistry, Inorganic materials of industrial importance, Green chemistry and chemistry of natural products, Analytical methods in chemistry, Polymer chemistry. ▪ Introduction of Discipline specific courses like Dissertation in 6^{th} semester. ▪ Introduction of Skill Enhancement courses like Mathematics and statistics for chemists, Analytical clinical biochemistry, pharmaceutical chemistry, pesticide chemistry.
Curriculum & Credit Framework (CCF, introduced since 2023-24 session)	▪ Introduction of Interdisciplinary Courses and Skill Enhancement Courses like AI for Everyone, Chemistry in Daily Life ▪ Summer Internship program

Figure 1. Chemistry faculties (from left to right: Mr. Biplab Ghosh, Dr. Debrina Jana, Mr. Dhiman Mondal, Mr. Biplab Halder, Mr. Partha Purkait)

Figure 2. Chemistry faculties with Honours students after students' seminar on the terrace of the college

FACULTY PROFILE

Name	Photo	Designation	Qualification	Specialization	E-mail ID
Dr. Debrina Jana		Assistant Professor	PhD	Physical Chemistry	debrina.chem @gmail.com
Biplab Ghosh		SACT II	M.Sc	Organic Chemistry	papaobg @gmail.com
Partha Purkait		SACT I	M.Sc	Organic Chemistry	purkaitp8 @gmail.com
Dhiman Mondal		SACT I	M.Sc	Organic Chemistry	mondaldhiman54 @gmail.com
Biplab Halder		SACT I	M.Sc	Physical Chemistry	Emailbiplabchem @gmail.com

PUBLICATIONS (ALL SCOPUS INDEXED)

Name	Name of Journal/Book	ISBN/ ISSN	Year of Publication, Volume, page no.	Title of the Article	International/ State/UGC Care List with Year
Dr. Debrina Jana*	ACS Applied Nano Materials	1944-8252	2020, 3, 2941–2951	Stable Mn-Doped $CsPbCl_3$ Nanocrystals inside Mesoporous Alumina Films for Display and Catalytic Applications	International (American Chemical Society)
Dr. Debrina Jana*	Journal of Physical Chemistry C	1932-7447	2021, 125, 3285–3294	Stable $CsPbI_3$-Mesoporous Alumina Composite Thin Film at Ambient Condition: Preparation, Characterization and Study of Ultrafast Charge Transfer Dynamics	International (American Chemical Society)
Dr. Debrina Jana*	ACS Applied Nano Materials	1944-8252	2021, 4, 1305–1313	Layered $Cs_4CuSb_2Cl_{12}$ Nanocrystals for Sunlight-Driven Photocatalytic Degradation of Pollutants	International (American Chemical Society)
Dr. Debrina Jana*	Book Chapter	979-8-89113-381-5	2024	Book chapter entitled 'Nanosheet structures of Pb-halide and Pb-free halide perovskites' in the book 'Properties and applications of nanosheets'	International (Nova Publishers)
Biplab Halder	ACS Omega	ACS Omega	2024, 9, 41787−41796	Synthesis, Structural Characterization, and Theoretical Analysis of Nonconventional Bonding in Dinuclear Zinc(II) Complexes with Tridentate Schiff Bases	International (American Chemical Society)
Biplab Halder	Journal of Molecular Structure	2470-1343	2024, 1302, 137416	Recent advances in the synthesis, X-ray diffraction characterization and application of cadmium complexes with hydrazine based bis-pyridine Schiff base ligands	International (Elsevier)

Biplab Halder	Inorganica Chimica A	0020-1693	2024, 573, 122323	An experimental and theoretical study of coinage bond interaction in a copper (II)/potassium (I) Schiff base complex	International (Elsevier)
Dhiman Mondal	Polymer Chemistry	1759-9962	2024, 15, 5007-5015	Reducing agent-triggered templated synthesis of a dynamic covalent poly(disulfide)s nanonetwork: remarkable tuning in noncovalent encapsulation stabilities and cargo release	International (Royal Society of Chemistry)

* corresponding author

COURSES ATTENDED

Name	Course Attended	Date
Dr. Debrina Jana	Faculty Induction Program by UGC-HRDC-University of Calcutta	01.02.2022—8.03.2022
Dr. Debrina Jana	One day workshop on the newly introduced UG Chemistry syllabus of CU	04.08.2023
Dr. Debrina Jana	Refresher course on Chemistry	14.09.2023-28.09.2023
Partha Purkait	One day workshop on the newly introduced UG Chemistry syllabus of CU	04.08.2023
Biplab Ghosh	One day workshop on the newly introduced UG Chemistry syllabus of CU	04.08.2023

PRESENTATION IN SEMINARS/CONFERENCES

Name	International/National/State/College level	Seminar/Conference with Date	Title of the paper
Dr. Debrina Jana	International level	ICEFN, 2019	Synthesis of nanocrystals in mesoporous host
Dr. Debrina Jana	International level	International Conference on Chemistry in Daily Life, 2022	Perovskite nanomaterials: new paradigm in photovoltaics and optoelectronics
Dr. Debrina Jana	State level	5th Regional Science and Technology congress, 2023	Pb halide perovskite and ZnSe chalcogenide core-shell structure: Improved stability and enhanced luminescence lifetime
Dr. Debrina Jana	International level	Emerging Trends in Chemical Sciences towards Sustainability and interdisciplinarity (ETCSTI-2025)	Lead and Lead free Halide Perovskite Nanomaterials

AWARDS

Name	Award	Year
Dr. Debrina Jana	Best paper presentation in faculty category in International conference titled 'Emerging Trends in Chemical Sciences towards Sustainability and interdisciplinarity (ETCSTI-2025)' organized by Bhawanipur Education Society College, Kolkata	2025

INVITED TALKS

Name	Name of the program	Year
Dr. Debrina Jana	5th Regional Science and Technology congress	2023
Dr. Debrina Jana	Faculty Development Program organized by K. K. Mangalam University in association with MH-MMTTC	2024

FACULTY REPRESENTATION IN VARIOUS COMMITTEES OF COLLEGE

Name	Participation in committees	Year
Dr. Debrina Jana	Examination	2020- till date
	Admission	2020-2024
	Academic	2020- till date
	Library	2020- till date
	Research	2020- till date
	Sports	2022-till date
Partha Purkait	Examination, Sports	2019- till date
Biplab Ghosh	Examination, Sports	2019- till date
Dhiman Mondal	Examination, Sports	2019- till date
Biplab Halder	Examination, Sports	2019- till date

STUDENTS' DETAILS

ADMISSION DATA

Course	Year	Number of seats sanctioned	Number of students admitted from the reserved category				
			SC	ST	OBC	Gen	Others
Chemistry Honours	2022-23	10	2	0	1	0	0
	2021-22	10	2	0	1	3	0
	2020-21	10	1	0	1	5	0

RESULTS

NAME OF COURSE	SESSION	Number of students appeared in the final year	Number of students passed	CGPA of the students
Chemistry Honours	2023-24	4	3	7.597
				7.433
				7.107
Chemistry Honours	2022-23	2	0	

PROGRAM OUTCOMES AND COURSE OUTCOMES

Name of the Program: B.Sc. Chemistry Honours (CBCS)

Chemistry is the branch of science that systematically study the composition, properties, and reactivity of matter at atomic and molecular level. The scope of chemistry is very broad. The key areas comprise Organic Chemistry, Inorganic Chemistry, Physical Chemistry and Analytical Chemistry. Thus, it covers a wide range of basic and applied courses as well as interdisciplinary subjects like nano-materials, biomaterials, etc. The Choice Based Credit System (CBCS) curriculum of the discipline of Chemistry is well designed and very promising. The core course would help to enrich the subject knowledge of the students and increase their confidence level. Generic electives make integration among various interdisciplinary courses to fulfil the vision and mission of designing the course. The introduction of Skill Enhancement Courses (SEC) would help to gain more powerful knowledge not only in their core Chemistry subject but also in interrelated multidisciplinary subjects. The inclusion of Discipline Specific Courses (DSE) has brought an opportunity in front of students to gain knowledge on various naturally and industrially important useful materials and also helps them become familiar and expert in handling different chemistry-based software after proper training. In brief, the student graduating with this type of curriculum would be able to expand subject knowledge along with necessary skills to suffice their capabilities for academia, entrepreneurship and industry. Outcomes of the course are briefed as follows: .

PROGRAM OUTCOMES

After successful completion of three year/four-year degree program in Chemistry a student should be able to

PO-1. Develop understanding of major concepts in all disciplines of Chemistry.

PO-2. Solving problems and also thinking systematically, independently and drawing a logical conclusion.

PO-3. Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of scientific project.

PO-4. Create an awareness of the impact of chemistry on the environment, society, and mankind in general.

PO-5. To inculcate the scientific temperament in the students and outside the scientific community.

PO-6. Learn and use modern techniques, various analytical equipment and Chemical software.

PO-7. To provide an opportunity to act as a team player by contributing in laboratory, field based work and industry.

PO-8. To develop scientific communication skills, one should be capable of expressing the subject through technical writing as well as oral presentation.

PO-9. Develop knowledge in understanding and carrying out data analysis, use of library search tools, use of chemical simulation software, related computational work.

The good practices nurtured through the courses in graduate level will bring a good opportunity to the students for getting jobs in industries besides academic and administrative work.

COURSE OUTCOMES

Name of the Program: B.Sc Chemistry Honours (CBCS)

Semester	Course Code	Course Outcomes
SEM -I	**CC-1**	**CO-1:** To know extra nuclear structure of atom **CO-2:** To understand acid base reactions **CO-3:** To know the basic concepts of redox reactions **CO-4:** To learn the basics concepts of organic chemistry specially on chemical bonding and physical properties **CO-5:** To study the estimation of ions or salts by acid-base titration method and oxidation-reduction titration method **CO-6:** To learn experimentally about the separation of compounds from a solid binary mixture by using common laboratory reagents
	CC-2	**CO-1:** To understand the basic concept of kinetic theory of gases and know how to solve numerical problems related to that topic. **CO-2:** To learn the transport processes of liquids and gases. **CO-3:** To understand rate laws, rate equations of different types of reactions, determine rate constant values, order of reactions, effect of temperature and other factors on reaction rate, homogenous catalysis, catalytic effect on reaction rate, equations related to chemical catalysis **CO-4:** To learn the basic concepts of Stereochemistry **CO-5:** To understand the formation and stability of reaction intermediates and their electrophilic and nucleophilic behavior. **CO-6:**To study the kinetics of decomposition of H_2O_2, acid-catalyzed hydrolysis of methyl acetate, viscosity measurement of unknown liquids, measurement of solubility of sparingly soluble salts. **CO-7:** To understand experimentally how to determine the boiling points of organic liquid compounds.

SEM-2	**CC-3**	**CO-1:** To learn stereochemistry of chiral compounds arising due to presence of stereo-axis; concept of prostereoisomerism and concept of conformations of stereoisomers. **CO-2:** To understand reaction kinetics, reaction thermodynamics and tautomerism of organic compounds. **CO-3:** To know the concept, types, reaction mechanism and examples of elimination, free-radical and nucleophilic substitution reactions. **CO-4:** To learn experimentally how to synthesize, calculate the yield and determine the melting point of pure organic compounds in the laboratory
	CC-4	**CO-1:** To learn about the basic concepts and types of chemical bonding, laws, rules and equations for formation of chemical bonds, solubility, hybridization and dipole moment of molecules. **CO-2:** To study the modern approaches of chemical bonding (Molecular Orbital Theory, Metallic Bonding conept, Role of weak intermolecular forces) **CO-3:** To understand about the concept of radioactivity and radioactive compounds, nuclear reactions, artificial radioactivity, radiocarbon dating, hazards of radiation and safety measures. **CO-4:** To know experimentally how to estimate the percentage of chlorine in bleaching powder; vitamin C; arsenic and antimony in a sample by iodimetric titration method. Students can also learn how to estimate Cu in brass, Cr and Mn in steel and Fe in cement.
SEM-3	**CC-5**	**CO-1:** To learn in detail about the first and second laws of Chemical Thermodynamics and the related terms; to get an idea about thermo-chemistry and thermodynamic relationships and system of variable compositions. **CO-2:** To gain vast knowledge on chemical equilibrium and electrochemistry. **CO-3:** To learn experimentally how to do the potentiometric and conductometric titrations of different compositions, determine the K_a of weak acid and heat of neutralization of a strong acid by a strong base.

	CC-6	**CO-1:** To study in detail about the modern periodic table, physical and chemical properties of the elements along a group or period, factors influencing those properties, relativistic effects and inert pair effect. **CO-2:** To study the chemistry of s and p block elements including noble gases and their compounds in detail. **CO-3:** To learn about inorganic polymers in detail **CO-4:** To know the meaning of various terms involved in co-ordination chemistry, Werner's theory for complex formation, structural and stereoisomerism of coordination complexes. **CO-5:** To learn the complexometric and gravimetric estimation of different ions, chromatographic separation of (i) Ni (II) and Cu (II) ions, (ii) Fe (III) and Al (III) ions.
	CC-7	**CO-1:** To learn in detail about the synthesis, properties, chemical reactions and reaction mechanisms of alkenes and alkynes **CO-2:** To understand about different types of electrophilic and nucleophilic aromatic substitution reactions, reaction intermediates and their mechanisms. **CO-3:** To study the properties and reactions of carbonyl compounds and corresponding reaction mechanisms. **CO-4:** To learn preparations, reactions and corresponding reaction mechanisms of organometallic compounds. **CO-5:** To study experimentally the qualitative detection of solid and liquid organic compounds. **CO-5**: To learn experimentally the quantitative estimation of organic compounds by titration method
	SEC-A	**SEC-2. ANALYTICAL CLINICAL BIOCHEMISTRY** **CO-1:** Helps to understand about the preparation, structures, reactions and biological importance of carbohydrates, proteins, enzymes, lipids and lipoproteins. **CO-2:** To know the biochemistry of different diseases through a diagnostic approach by blood and urine analysis. **CO-3:** To learn how to isolate proteins and how to perform the qualitative estimation of carbohydrate, proteins and lipids. **CO-4:** To study the quantitative estimation of carbohydrate, cholesterol, nucleic acids, determination of the iodine number of oil and saponification number of oil.
SEM-4	**CC-8**	**CO-1:** To understand in detail about the synthesis, separation, properties, identification, chemical reactions and their corresponding mechanism of nitrogen containing compounds. **CO-2**: Discussion about different kinds of rearrangement reactions. **CO-3:** Helps to know the logic of organic synthesis **CO-4:** To study UV-Visible, IR and NMR spectroscopy in detail. **CO-5:** Helps to know experimentally the qualitative analysis of

		single solid organic compounds
	CC-9	**CO-1**: Helps to understand about the applications of Thermodynamics in Colligative Properties and Phase Equilibrium **CO-2:** To study the fundamentals of Quantum Mechanics **CO-3:** Helps to know the Bravais Lattice and Laws of Crystallography, Crystal Planes and Specific Heat of Solid **CO-4:**To know experimentally how to study phase diagram of a Phenol-Water system, kinetic study of inversion of cane sugar, determination of partition co-efficient value, pH of an unknown solution and pH metric titration of an acid against strong base.
	CC-10	**CO-1:** Helps to understand about the structures, stability, colour, magnetism and Orgel diagram of the co-ordination compounds on the basis of modern concepts of chemical bonding. **CO-2:** To study the chemical and physical properties of d and f Block elements and their compounds. **CO-3:** To learn the reaction kinetics and mechanisms of inorganic reactions. **CO-4:** To study experimentally how to synthesize inorganic complexes and determine the λmax values of inorganic complexes. **CO-5:** To calculate the 10 Dq value by spectrophotometric method
	SEC-B	**SEC-3. PHARMACEUTICALS CHEMISTRY** **CO-1:** Helps to understand about the drug discovery, design and development of representative drugs of the following classes: Antipyretic, Analgesics, Antiinflammatory, Anti-bacterial, Antifungal, Antiviral, Antibiotics, Anti-laprosy, Central Nervous System agents, HIV-AIDS related drugs **CO-2:** To know about aerobic and anaerobic fermentation, importance of Vitamins and Amino acids, synthesis of Penicillin, Cephalosporin, Chloromycetin, Streptomycin and their role as an antibiotic. **CO-3:** To learn experimentally how to prepare aspirin in the laboratory and how to analyze it. **CO-4:** To learn experimentally how to prepare magnesium bisilicate in the laboratory.
SEM-5	**CC-11**	**CO-1:** Helps to understand the fundamental concept, basic terms, derivation and application of Quantum Mechanics **CO-2:** To know about the necessary laws, rules, terms, expressions and derivations statistical thermodynamics **CO-3:** To learn laws, rules and equations for numerical analysis of Roots of Equation and Least-Squares Fitting. **CO-4:** To study about the Computer Programming on Roots of equation, Numerical differentiation and Numerical integration.

	CC-12	**CO-1:** To learn in detail about the synthesis, properties, chemical reactions and reaction mechanisms of polynuclear hydrocarbons and their derivatives. **CO-2:** To study the chemical reactions, properties and synthesis of heterocyclic compounds. **CO-3:** To know in detail about the stereochemistry, properties and chemical reactions of alicyclic compounds. **CO-4:** To learn the mechanism, stereochemistry and regioselectivity of pericyclic reactions. **CO-5:** Helps to understand about the classification, structure, properties, reactions and use of carbohydrate molecules. **CO-6:** Deals with the synthesis, structure, properties, chemical and biological reactions of amino acids, peptides and nucleic acids. **CO-7:** To learn experimentally how to separate molecules by chromatographic methods **CO-8:** To study how to analyze the Organic compounds by spectroscopic techniques.
	DSE	**A-2. APPLICATIONS OF COMPUTERS IN CHEMISTRY** **CO-1:** Helps to understand about the basics of computer programming (FORTRAN), creating and application of spreadsheet software (MS Excel) **CO-2:** Helps to know about statistical data analysis. **CO-3:** To learn how to prepare graphs by using spreadsheet, help to determine vapour pressure, rate constant, equilibrium constant, molar extinction coefficient value, concentration of ions at equilibrium and molar enthalpy of vapourisation. **CO-4:**To study about the Acid-Base Titration Curve, Plotting of First and Second derivative Curve for pH metric and Potentiometric titrations, Calculation and Plotting of a Precipitation Titration Curve with MS Excel, Michaelis-Menten Kinetics for Enzyme Catalysis using Linear and Non - Linear Regression. **B-1. INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE** **CO-1:** Helps to understand about the manufacture, properties, compositions, classes and applications of industrially important materials such as ceramics, glasses, cements, fertilizers, surface coating materials and batteries. **CO-2:** To know about alloys, manufacture of steel, composition and properties of different types of steels. **CO-3:** To learn about the general principles, properties, classification, industrial use, deactivation and regeneration of catalysis. **CO-4:** Helps to understand about the preparation and explosive properties of organic and inorganic explosives and the basic idea of rocket propellant.

SEM-VI	**CC-13**	**CO-1:** To study the Theoretical Principles in Qualitative Analysis **CO-2:** To learn about Bioinorganic Chemistry and Organometallic Chemistry **CO-3:** To know about the catalytic role of organometallic compounds in different types of industrial processes. **CO-4:** To study experimentally the qualitative detection of known and unknown radicals and insoluble materials in a mixture.
	CC-14	**CO-1**: To learn in detail about molecular spectroscopy. **CO-2:** To understand about the basic principles and laws of Photochemistry and also get idea about the theory of reaction rate. **CO-3**: To know details about surface energy and surface tension; Classification, Adsorption Isotherms and applications of Adsorption; Classification, rules and properties of Colloids. **CO-4**: To learn about the fundamental concepts, important equations, properties and applications of polarizability and dipole moment. **CO-5**: To know how to determine surface tension of a liquid; Indicator constant of an acid base indicator; pH of an unknown buffer solution and CMC of a micelle experimentally. **CO-6**: To study the kinetics of $K_2S_2O_8$ + KI reaction and Verification of Beer and Lambert's Law for $KMnO_4$ and $K_2Cr_2O_7$ solution experimentally.
	DSE	**A-3. GREEN CHEMISTRY AND CHEMISTRY OF NATURAL PRODUCTS** **CO-1:** To learn about green chemistry and its necessity. **CO-2:** To study about the principles of green chemistry and designing the green synthetic routes. **CO-3:** To know about the examples of green reactions and future trends in green reaction. **CO-4:** To learn the synthesis, psychological properties, isolation medicinal importance and other synthetic use of terpenes and alkaloids CO-5: To learn how to perform green synthesis of a number of organic compounds in the laboratory. **B-4. DISSERTATION** **CO-1:** To know how to do research work and write a review article on a particular field/topic as assigned by the teacher **CO-2:** To know how to handle the technical devices for presenting research works.

COURSE OUTCOMES

Name of the Program: B.Sc Chemistry Honours (Under CCF 2022)

Year of Introduction: Session 2023-24

Semester	Course Code	Course Outcome
I	CC1	**Fundamentals of Chemistry-I** **CO-1**: Provide students with a comprehensive understanding of the extranuclear structure of atoms and their influence on chemical behavior and also explore the periodic table, periodic trends, and their correlation with atomic structure. CO-2: fundamental concepts of organic chemistry, focusing on the nature of chemical bonding and the relationship between molecular structure and physical properties CO-3: Provide a foundational understanding of thermodynamics and chemical kinetics.
	SEC1	**Quantitative Analysis and Basic Laboratory Practices** **CO-1**: Introduce students to the fundamental principles and techniques of quantitative analysis and its broad applications across various scientific fields CO-2: Introduce the principles and methods of titrimetric analysis, focusing on different types of titrations and their applications; learn about key concepts such as normality, molarity, molality, mole fraction, ppm, and ppb, along with the preparation and dilution of standard solutions CO-3: Learn about impurities in water and the standards for water quality for potable, domestic, industrial, and agricultural purposes; provide students with a solid foundation in water quality analysis and treatment, essential for ensuring safe and sustainable water use.

Semester	Course Code	Course Outcome
II	CC2	**Fundamentals of Chemistry – II** CO-1: Understand the fundamental principles of the kinetic theory of gases, including molecular motion, gas laws, and the behavior of ideal and real gases. CO-2: Learn about different types of chemical bonds, including ionic, covalent, and metallic bonds; understanding bond formation, bond energy, hybridization, molecular geometry, and the impact of bonding on molecular properties. CO-3: Develop a deeper understanding of stereochemistry; Gain foundational knowledge of reaction mechanisms, including types of reactions (substitution), reaction intermediates, and the role of energy profiles in determining reaction pathways.
	SEC 2	**AI for Everyone** CO-1: Understand Artificial Intelligence (AI) and its difference from human intelligence; explore core AI subfields e.g. machine learning, deep learning and neural networks CO-2: Introductory understanding of AI's role in healthcare , finance, transportation, customer service, and education; Gain knowledge on critical ethical concerns including bias and fairness in AI systems, privacy and data protection, the impact of AI on employment, and its role in amplifying social inequality. CO-3: Gain knowledge on ethical guidelines and responsible AI practices; explore how AI drives innovation across industries and examine emerging trends and future directions in AI technology

Semester	Course Code	Course Outcome
III	CC3	**Physical Chemistry – I** CO-1: Develop thorough understanding of the second law of thermodynamics, its principles, and applications; learn about thermodynamics of pure and mixed systems CO-2: Gain insight on thermodynamic conditions for equilibrium and explore the relationship between standard Gibbs free energy change and reaction conditions CO-3: Gain a detailed understanding of electrochemical principles, focusing on conductance and ionic equilibrium; Develop a solid foundation in electrochemical processes and

		their applications in various fields.
	CC4	**Organic Chemistry – I** CO-1: In-depth exploration of aromatic substitution reactions, focusing on both electrophilic and nucleophilic mechanisms; Introduces fundamental concepts of organic acids, bases, and tautomerism, with a focus on pKa, the effects of substituents and solvents on acidity CO-2: Build solid foundation in the principles of stereochemistry, conformational analysis, and reaction mechanisms, enabling them to apply this knowledge to understand and predict the outcomes of organic reactions CO-3: Develop a strong grasp of the chemistry of alkenes and alkynes, including their structural features, reactivity patterns, and various addition reactions; build understanding and predicting the behavior of these compounds in organic synthesis and other applications.
	SEC3	**Introduction to Numerical Methods for Chemists** CO-1: Equip students with a deep understanding of the fundamental principles and techniques used in numerical analysis. Students will learn about various numerical methods, their applications, and their limitations CO-2: Gain ability to use these methods to solve equations, approximate functions, and analyze data efficiently and accurately that focuses on practical application of numerical methods in different fields CO-3: Enhance students' ability to identify and solve problems using numerical techniques and learn to analyze problems, choose appropriate methods, and interpret the results

Semester	Course Code	Course Outcome
IV	CC5	**Inorganic Chemistry – I** CO-1: Understanding of the principles of molecular orbital theory and its application to different types of chemical bonding; Gain ability to analyze the structure and properties of molecules based on their electronic structure and intermolecular interactions. CO-2: Build solid understanding of acid-base chemistry, including the different definitions, concepts, and their applications in aqueous solutions; develop ability to analyze acid-base equilibria, calculate pH, and select appropriate indicators for acid-base titrations. CO-3: Acquire basic knowledge of radioactivity, nuclear stability, and various nuclear reactions; build understanding on the principles and applications of radiocarbon dating
	CC6	**Organic Chemistry – II** CO-1: Comprehensive understanding of conformational analysis and chiral molecules, including pro-stereoisomerism and chirality arising from stereoaxes; gain ability to analyze the stereochemistry of various molecules and predict the potential for stereoisomerism CO-2: Develop comprehensive understanding of the chemistry of carbonyl compounds, including their structure, reactivity, and various transformations. They will be able to apply this knowledge to design and analyze organic synthesis routes involving carbonyl compounds CO-3: Build solid understanding of organometallic compounds, their preparation, reactions, and applications acquire ability to utilize these reagents effectively in organic synthesis to form new carbon-carbon bonds and introduce functional groups.
	CC7	**Physical Chemistry - II** CO-1: Build strong foundation in transport processes and the properties of liquids; gain understanding on diffusion, viscosity, and surface tension, as well as their underlying principles and applications. CO-2: Develop solid understanding of the structure and properties of solids; acquire the ability to analyze crystal structures, determine unit cell dimensions, and apply Bragg's law to diffraction experiments CO-3: Build a strong understanding of colligative properties, phase equilibria, and electrochemistry; Gain ability to apply these concepts to various systems, calculate molar masses, analyze phase diagrams, and understand the principles of electrochemical cells and their applications.

	CC8	**Inorganic Chemistry – II** CO-1: Acquire solid understanding of coordination chemistry, including fundamental concepts, theories, and applications;Gain ability to analyze the structure, bonding, spectra, and magnetic properties of coordination compounds CO-2: Develop a strong understanding of the principles and applications of supramolecular chemistry; Gain ability to analyze the role of non-covalent interactions in the formation and stability of supramolecular CO-3: Build a solid understanding of redox reactions, including their principles, balancing, and applications; gain ability to analyze redox processes, predict the feasibility of redox reactions, and perform redox titrations

DEPARTMENTAL ACTIVITIES

INTERNATIONAL WEBINARS

Year	Webinar name	No. of Talks	Speaker Affiliation	National/International
2020	Advanced Functional Materials for Energy and Environmental Applications	1	Yonsei University, South Korea	International
2023	Scope of Chemistry in Industry	2	1. Amyris, Inc, USA 2. Honeywell UOP, India	International
2023	Research on Nanomaterials'	2	1. Tampere University 2. University of St. Andrews, UK	International
2024	• Advancement in solar energy research • Opportunities of higher education in UK	2	University of Exeter, UK	International

Report of WEBINAR 1:

Department of Chemistry presents
One Day International Webinar on
'Advanced Functional Materials for Energy and Environmental Applications'
19.09.2020
3.30 pm onwards

Objective: Students and researchers interested to know about the ongoing research about the above topic should participate in this webinar. Special emphasis is given on:

- Advanced Functional materials
- Energy and Environmental applications
- Battery, supercapacitor
- Sustainable Chemistry

Speakers:

1. Dr. Partha Pratim Das

Postdoctoral researcher, Department of Earth Sciences, Yonsei University, Seoul, South Korea

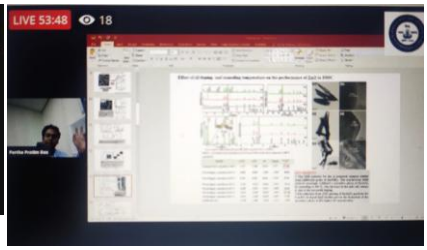
Abstract of the talks:

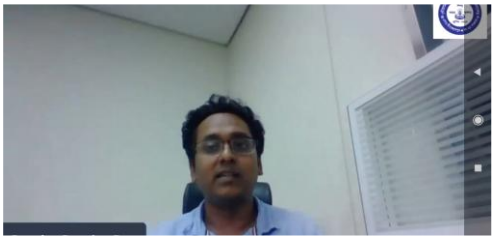
Talk 1: Advanced Functional Materials for Energy and Environmental Applications

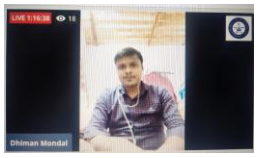
Dr. Partha Pratim Das

Dr. Das talked about the exciting field of materials chemistry with special emphasis of the advanced functional materials. He showed the synthetic procedures, explained the characterization of the materials and then moved on to discuss the application of these materials in the field of energy and environment. He especially emphasized on battery, photovoltaics and supercapacitor applications.

Few glimpses of the webinar:







No. of participants: 81

E-flyer of webinar 1:

Report of WEBINAR 2

Department of Chemistry presents
One Day International Webinar on
'Scope of Chemistry in Industry'
03.01.2023
12.15 pm onwards

Objective: Students and researchers interested to know about the ongoing research in industry should participate in this webinar. Special emphasis is given on:

- Synthetic Organic Chemistry
- Photochemistry
- Chemical Engineering

Speakers:

1. Dr. Anushree Das
   Scientist, Amyris, Inc
2. Mr. Laltu Duary
   Manager, Process Engineering, H2 technologies, Honeywell UOP

Abstract of the talks:

Talk 1: FROM ORGANIC PHOTOCHEMISTRY TO PROCESS CHEMISTRY

Dr. Anushree Das

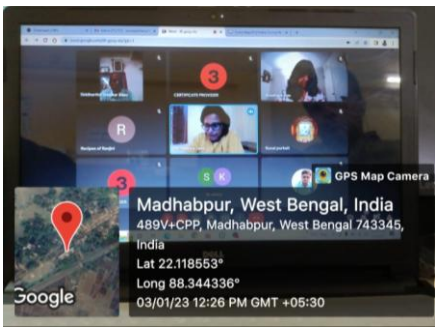
Natural product synthesis is attracting a dynamic interest in research around the world today in order to develop effective synthetic strategies as well as large scale synthesis for biological investigations, drug discovery, medicinal applications etc. Finding inexpensive techniques to synthesize natural products is always in demand over extraction directly from nature. Dr. Das's group is interested in sustainable photochemical synthesis of natural products. There are several industrial examples of light-mediated synthesis of natural compounds, such as, dihydroartemisinic acid is irradiated under light emitting diode (LED) to produce semisynthetic artemisinin, a popular antimalarial drug. Mechanistic guidance around the photochemical synthesis and understanding reactive intermediates help to design the scheme. In this talk, Dr. Das presented the design process of a photoremovable protecting group and discussed the synthesis mechanism. She further demonstrated different parameters to consider when scaling up a bench synthesis process towards industrial production.

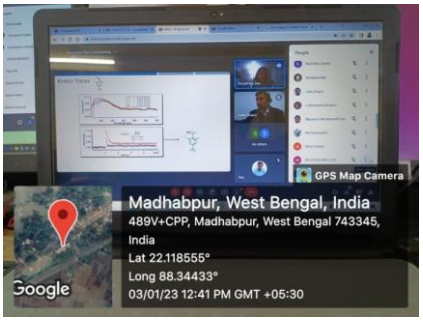
Talk 2: H_2 AND ENVIRONMENTAL SUSTAINABILITY

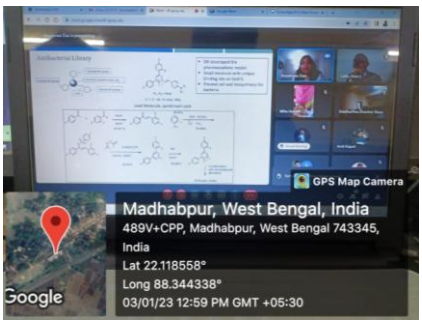
Mr. Laltu Duary

In this talk, following topics were discussed: Pollution, global Warming, Green House Gas and emission. He talked about significant processes involved in industrial H_2 generation, purification and various challenges in conventional H_2 production. Aim was to familiarize the audience regarding the ongoing industry projects relevant to the above topics. Research and job scope in various industries for the students having Chemistry Major were also discussed.

Few Glimpses of the webinar







No. of participants: 180

E-flyer of the webinar

Report of WEBINAR 3

Department of Chemistry presents
One Day International Webinar on 'Research on Nanomaterials'
14.03.2023, 11.30 am onwards

Objective: Students, researchers, and faculties interested to know about the ongoing research in Materials Chemistry may attend the webinar. Special emphasis is given on:

➢ On-going research in Materials Chemistry

➢ Green hydrogen production

➢ Nanoparticle assemblies

Speakers:

1. Dr. Nonappa B.
   Associate Professor at Tampere University, Finland
2. Dr. Shreyasi Chattopadhyay
   Post doctoral researcher at University of St. Andrews, UK

Abstract of the talks:

Talk 1: PRECISION NANOPARTICLE ASSEMBLIES: FROM 2D COLLOIDAL CRYSTALS TO ELASTIC MEMBRANES

Dr. Nonappa B

Electron microscopy (EM) is one of the powerful imaging techniques to study a diverse range of synthetic and biological materials. EM images of three dimensional (3D) objects produce superimposed two dimension- al (2D) orthogonal projections. Importantly, in transmission electron microscopy (TEM) images, the 2D projection often contains high resolution structural details. Because of the superimposed nature, limited amount of correct internal structural information is obtained from the 2D images. To overcome the above limitations, electron tomographic (ET) reconstruction (i.e. 3D reconstruction) or single particle reconstructions (SPR) meth- ods have been developed and studied. The success of 3D reconstruction relies on the quality of the data and which in turn depends entirely on the quality of the specimen. In this webinar, Dr. Nonappa discusses the basic concepts, methods and applications of electron tomography for structural understanding of a wide range of colloidal superstructures.

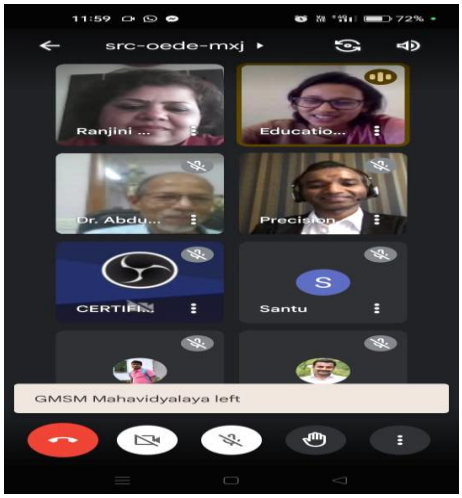
Talk 2: NANOMATERIALS FOR GREEN HYDROGEN PRODUCTION: FUTURE FUELING

Dr. Shreyasi Chattopadhyay

To address the global energy and environmental crisis, hydrogen production, especially green hydrogen is attracting significant research attention. The purpose of the talk was to make understanding of the basic of research concept, green hydrogen and its future perspective. To elaborate the concept of photocatalytic water spilling by nanomaterials, special emphasis was given on the hydrogen evolution activity of different oxide-based photocatalysts.

In the end, opportunities available for the students to pursue research in India and foreign countries were discussed.

Few Glimpses of the webinar



No. of Participants: 76

E-flyer of the webinar

Report of WEBINAR 4

Department of Chemistry presents

One Day International Webinar on 'Advancement in solar energy research' and 'Opportunities of higher education in UK'

27.03.2024, 1.30 pm onwards

Youtube link: https://www.youtube.com/watch?v=vjZyPM1lJ1w

Objective: Students, researchers, and faculties interested to know about the ongoing research in solar energy and higher study opportunities in UK may attend the webinar. Topics are:

➢ Advancement in solar energy research

➢ Opportunities of higher education in UK

Speaker:

Dr. Anurag Roy
EPSRC Research Fellow
University of Exeter
Penryn Campus
United Kingdom
Link: https://experts.exeter.ac.uk/32766-anurag-roy

Abstract of the talk:

Talk 1: PRECISION NANOPARTICLE ASSEMBLIES: FROM 2D COLLOIDAL CRYSTALS TO ELASTIC MEMBRANES

Dr. Anurag Roy

In this talk, Dr. Anurag started his talk taking the listeners along the path of the importance of materials chemistry in solar energy research. He thoroughly discussed the topics of photovoltaics, glazing and solar thermal, waste water treatment and last but not the least solar fuels.

Talk 2: Higher Studies Opportunities in the U.K.

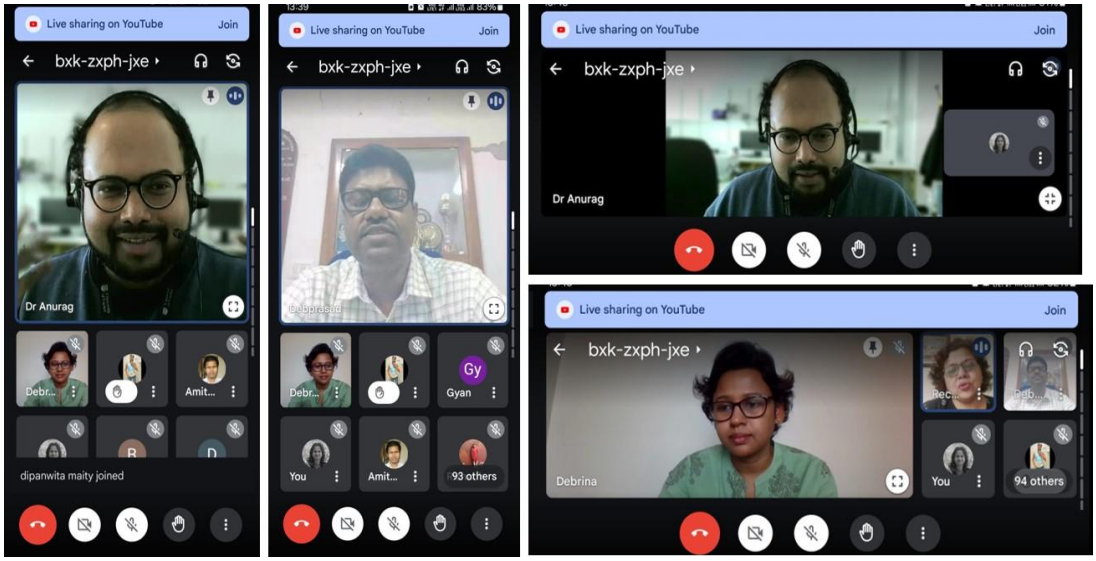
Dr. Anurag Roy

In this talk, Dr. Anurag gave an outline and also detailed information on some of the following like:

- Why study in UK?
- How to find your University course in UK?
- How to choose a University and apply for it?
- Different scholarships
- India-UK PhD fellowships

No. of registered participants: 222

Few glimpses of the webinar



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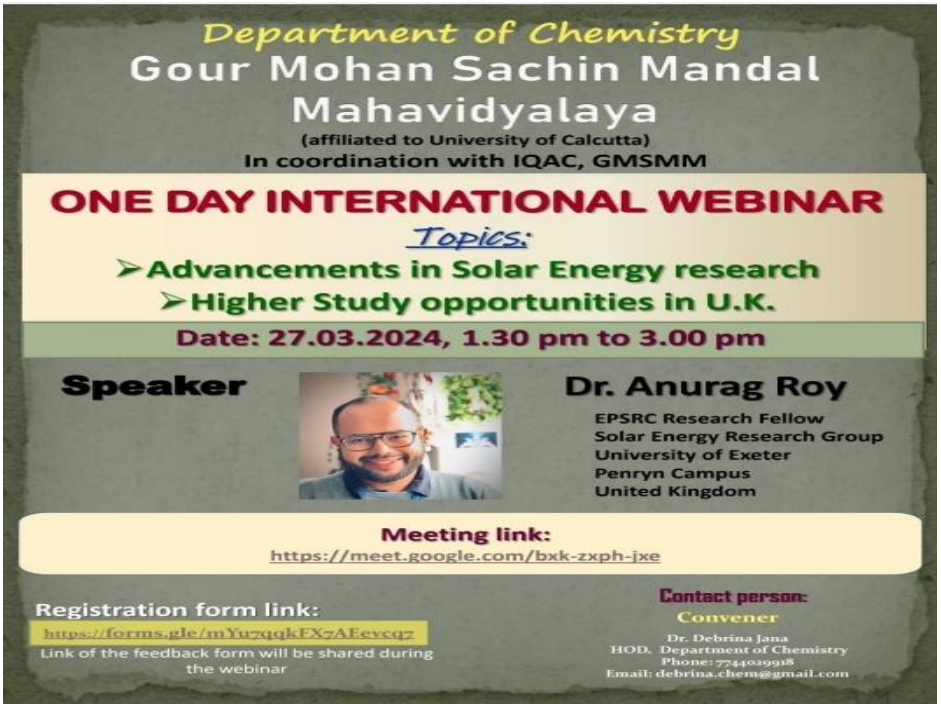


DEPARTMENTAL ACTIVITIES

Students' seminar to celebrate 'Energy Conservation Day'

21.12.2022, 11.30 am onwards

Energy Conservation day is celebrated worldwide on 14th December every year. We all, as responsible habitant of this earth, should be thinking about minimizing our energy usage. Our students chose to talk about energy related issues and enlightened us about minimizing energy usage.

To celebrate National Energy conservation day, Chemistry Department organized a students' seminar (both oral and poster presentation) on 21.12.22. Both Honours and General students participated in this seminar. Few glimpses are given below.

Programme schedule:

Introductory Speech:
Dr. Debrina Jana, HoD, Chemistry Department 11.30-11.35 am

Inaugural speech:
Dr. A. J. Hasan, Principal 11.35-11.45 am

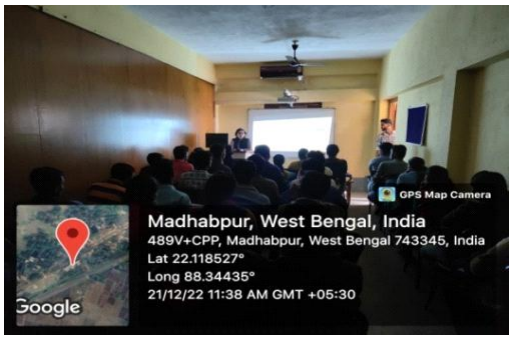
Oral presentation session:

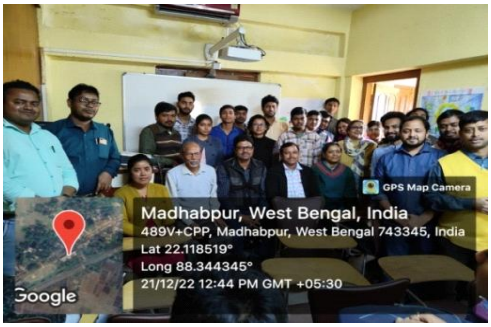
Speakers	Student of	Title of the talk	Time
Protim Chakraborty	Chemistry Hons. 5th semester	Energy conservation through green chemistry	11.45 am
Pratik Halder	Chemistry Hons. 3rd semester	Solar Energy	12.05 pm
Rama Mondal	Chemistry Hons. 5th semester	Conservation of energy through Photocatalysts	12.25 pm
Kanchan Halder	Chemistry Hons. 3rd semester	Conservation of energy through thermodyanamics	12.45 pm
Santu Halder	Chemistry Hons. 3rd semester	Minimizing CO_2 emissions with the help of renewable energy	01.05 pm

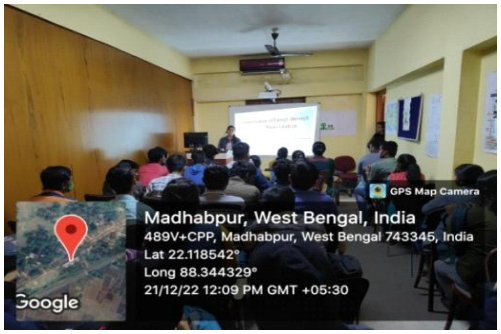
Poster presentation session: parallel session, discussion will start after oral presentations are over.

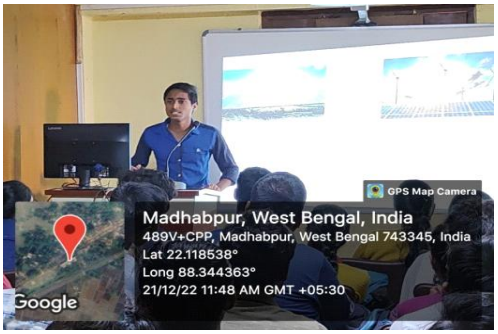
No. of participants: ~50

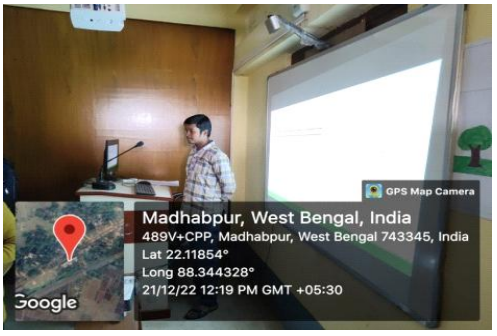
Few Glimpses of the students' seminar











FIELD TRIPS

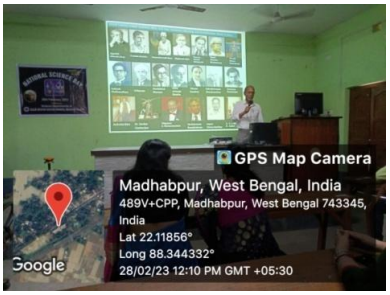
'INDUSTRY VISIT' CONDUCTED BY DEPARTMENT OF CHEMISTRY

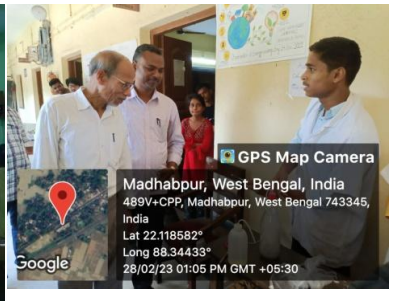
An educational Industry visit was organized by the Department of Chemistry to 'Berger Paints' on 17.03.2023. Chemistry Honours students (IV, VI) and Chemistry General students (IV, VI) along with all the Departmental faculties participated in the Industry visit.

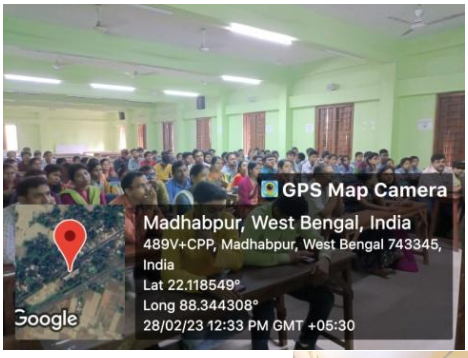
Students and faculties of the Dept. arrived in the 'Berger Paints' Industry at 10 a.m. Upon arrival, they were first delivered a lecture on 'Paints' by the personnel from Manufacturing Unit of Berger paints. Later, students and faculties got the opportunity to visit the manufacturing unit and observe all the activities going on. Whole time, the personnel from Manufacturing unit was guiding them. Later, they were taken to Quality control Department and finally to the Research and Development Cell. It was really exciting for all to see the live demo of the processes, various characterization techniques and so on. Happy faces of the students and faculties at the end of the tour say it all!

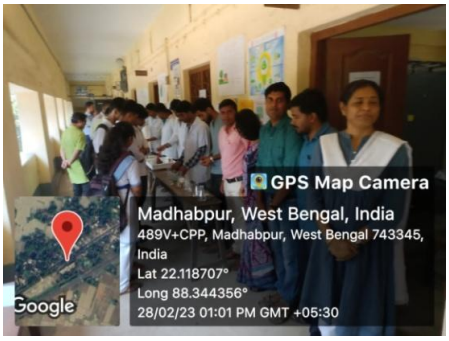
SCIENCE DAY CELEBRATION

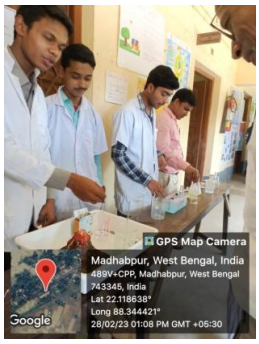
Chemistry Department Organized National Science Day to celebrate Prof. C.V. Raman's birthday on 28th February. School students of nearby village also participated. Science exhibition demonstrating live experiments, quiz, Mukabhinaya were organized. Not only, students and teachers from all Science Departments but also students and teachers from other departments whole heartedly participated and enjoyed.

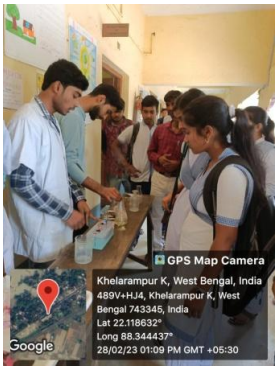












STUDENTS' WEEK CELEBRATION

Students' week was celebrated from 02.01.2023-07.01.2023 according to the order of Govt. of West Bengal. Throughout the week, following activities were done in Chemistry Department:

- Online seminar (International seminar on 03.01.2023)
- Poster competition
- Extempore speech
- Quiz competition

Glimpses of activities are shown below:

ADD-ON COURSE CONDUCTED BY DEPARTMENT OF CHEMISTRY

Both CBCS and CCF syllabus provides the introduction of materials chemistry to the students. As for example, students get an outline about solid state chemistry and ceramics, batteries, solar cells *etc.* as per their syllabus but they neither get the vivid picture of the materials and the chemistry behind choosing the elements for the synthesis of the materials nor do they get to know about characterization of these materials through these courses . Our add-on course 'Introduction to Materials Chemistry' gives a comprehensive study both on the advanced materials and cutting-edge research on this particular field. Not only this add-on course gives the opportunity to the students to learn about the crystal structure and various advanced materials but also introduces them to the advanced techniques for characterization of the materials and the environmental impact of these materials.

Course Content (Duration: 30 hours)

Crystal structure, Introduction to nanomaterials, Overview of property of nanomaterials, Optical property of nanomaterials, Synthesis of nanomaterials, Characterization of nanomaterials using different techniques. (8)

Green Chemistry: Introduction, Objectives, Needs, Limitation/ obstacles, Twelve Principles, Atom Economy, Green solvents– Supercritical fluids, Ionic liquids, PEG, Alternative sources of Energy: Microwaves and Ultrasonic energy, Hofmann Elimination, Diels-Alder reaction, Oxidation, Simmons- Smith Reaction Decarboxylation reaction, Hofmann Elimination, Diels-Alder reaction, Oxidation, Simmons- Smith Reaction, Decarboxylation reaction, Adipic acid, Catechol, Disodium iminodiacetate, Future trends in Green Chemistry, Green chemistry in sustainable development. (6)

Introduction on carbon nanomaterials, types of carbon naomaterials, carbon nanotubes, Types of carbon nanotubes, covalent bond in graphite, diamond and carbon nanotubes, Properties of carbon allotropes and carbon nanotubes, application of carbon nanotubes, Challenges and future progress on carbon nanotubes, manufacturing methods of carbon nanotubes, Nanotube growth method, chemical vapor deposition, functions of carbon nanotubes. (5)

Smart Materials: Introduction, classification of smart materials, Interdisciplinary nature of smart materials, Specific types of smart materials, shape memory alloy, shape memory effect, SMA application, Piezoelectric materials, Reverse piezoelectric effect, application of piezoelectric effect, Magnetostrictive materials and its application, Magneto-Rheological fluids and its application, Application of smart materials. (5)

Renewable Energy, Differences between renewable and non-renewable sources of energy, Renewable energy sources, Solar power and its principles, Uses of solar power, Advantages and disadvantages of solar power, Wind Energy and its principles, Uses of wind energy, Advantages and disadvantages of wind energy, Hydroelectricity, Advantages and disadvantages of Hydroelectricity, Tindal Power and its principles, Advantages and

disadvantages of Tindal power, Biomass Energy, Advantages and disadvantages of using Biomass, Biofuels and use of Biofuels, Advantages of Biofuels, Fuel Cell, Nuclear Energy, Nuclear fission and Nuclear fusion, Nuclear Power, Challenges associated with it, Advantages and disadvantages of Nuclear Energy, Geo-Thermal Power, Advantages and disadvantages of Geo-Thermal Power, Piezoelectric Effect and its working principles, Applications of Piezoelectric Effect and its future aspects. (6)

E-Flyer of the add-on course


Students receiving certificates after successful completion of the course from Chemistry faculties

DEPARTMENTAL WALL MAGAZINE

Chemistry Department has its own wall magazine named 'Dopamine'. It is entirely done by the students. Current Chemistry news, short essay on various topics related to Chemistry, poems and drawings on Chemistry topic are published here.

DEPARTMENTAL FUNCTIONING

ORIENTATION PROGRAM

Orientation program is held at the start of every semester to familiarize students with the program. Departmental faculties talk about the syllabus, nature of assessment, attendance etc. The students get the opportunity to know the departmental whereabouts like departmental facilities.

LESSON PLAN

LESSON PLAN: CHEMISTRY (CCF)

(DJ: Dr. Debrina Jana BG: Biplab Ghosh PP: Partha Purkait
BH: Biplab Halder DM: Dhiman Mandal)

4 YEAR B.Sc DEGREE COURSE and 3 YEAR B.Sc COURSE (MDC):

SEM 1

Program	Course Code	Topic	Teachers	No. of Hours	Marks
Major	CHEM- H-CC1-1-Th	Extra nuclear structure of atoms and Periodicity	BG	15	75
		Basics of organic Chemistry Bonding and Physical Properties	PP, DM	15	
		Thermodynamics-I and Chemical Kinetics-I	DJ	15	
	CC 1-1-P	Acid-base titration, Oxidation-Reduction titrimetry	PP, BH	30	25
	SEC 1-1-TH	Titrimetric analysis, Acid-base titrimetry, Redox titrimetry, Precipitationtitrimetry	DJ, BH, BG	10	75
		Complexometric titrimetry, Water analysis, Water treatment technology		09	
		Introduction to Quantitative analysis and its interdisciplinary nature,Gravimetric analysis		19	
		Water treatment technology and Basic Laboratory Practices		07	
	SEC 1-1-Tu	TUTORIAL	DJ, BH, BG		25
	CHEM- H-IDC 1-1-TH	Titrimetric analysis, Acid-base titrimetry, Redox titrimetry, Precipitation titrimetry, Complexometric titrimetry	DJ, BH, BG		50
		Introduction to Quantitative analysis and its interdisciplinary nature,Water analysis, Water treatment technology, and			

		Basic Laboratory Practices			
	CHEM- H-IDC 1-1-Tu	TUTORIAL	DJ, BH, BG	15	25

Minor / MDC	CHEM-H-CC1-1-Th and CHEM-MD-CC1-1-Th	Extra nuclear structure of atoms and Periodicity		BG	15	25
		Basics of organic Chemistry Bonding, Physical Properties and Stereochemistry-I		PP, DM	15	25
		Thermodynamics-I and Chemical Kinetics-I		DJ	15	25
	CC1-1-P	Acid-base titration, Oxidation-Reduction titrimetry		PP, BH	30	25
MDC	CHEM-MD-SEC-Th	Chemistry in Daily Life - Theory	Module-1	PP	15	75
			Module-2	DM	15	
			Module-3	DJ	15	
	CHEM-MD-SEC-Tu	Chemistry in Daily Life - Tutorial	Estimation of Vitamin C	PP, DM, DJ	15	25
			Determination of saponification number of oil.			
			Determination of Iodine number of oil.			
MD-IDC	IDC 1-1-Th	Chemistry in daily life	Module-1	PP	10	75
		Chemistry in daily life	Module-2	DM	10	
		Chemistry in daily life	Module-3	DJ	10	
	SEC 1-1-Tu	TUTORIAL		PP. DM, DJ	15	25

SEM 2

Program	Course Code	Topic	Teachers	No. of Hours	Marks
Major	CHEM-H-CC2-2-Th	Fundamentals of Chemistry - II	BH, BG, PP	45	75
	CHEM-H-CC2-2-P	-Do-	DJ, BG	30	25
	CHEM-H-SEC2-2-Th	AI for Everyone	DJ	45	100
Minor/MDC	CHEM-H-CC2-2-Th	Chemistry MINOR-II	DJ, DM	45	75
	CHEM-H-CC2-2-P	-Do-	DJ, BG	30	25
IDC	CHEM-H-IDC2-2-Th	Chemistry in Daily Life	DJ, BG, BH		75
	CHEM-H-IDC2-2-Pr	-Do-	DJ, BG, BH		25
SEC	CHEM-SEC-Th	Chemistry in Daily Life	DJ, BG, BH		75
	CHEM-SEC-Pr	-Do-	DJ, BG, BH		25

SEM 3

Program	Course Code	Topic	Teachers	No. of Hours	Marks
Major	CHEM-H-CC3-3-Th	Physical Chemistry I: Thermodynamics -II , Applications of Thermodynamics – I , Electrochemistry-I.	DJ, BH	45	75
	CHEM-H-CC3-3-P	-Do-	DJ, BH	30	25
	CHEM-H-CC4-3-Th	Organic Chemistry – I: Aromatic Substitution Reaction , General Treatment of Reaction Mechanism-II, Substitution, elimination, Addition to alkenes, dienes, alkynes	PP, DM	45	75
	CHEM-H-CC4-3-P	-Do-	PP, DM	30	25
	CHEM-H-SEC3-3-Th	Introduction to Numerical Methods for Chemists	DJ, BH	45	75
	CHEM-H-SEC3-3-Tu	Introduction to Numerical Methods for Chemists	DJ, BH	15	25
	CHEM-H-IDC3-3-Th	Quantitative Analysis and Basic Laboratory Practices	DJ, BH, BG	45	75
	CHEM-H-IDC3-3-Tu	-Do-	-Do-	30	25

Minor	CHEM- H-CC1-3-Th	Extra nuclear structure of atoms and Periodicity		BG	8	25
		Basics of organic Chemistry Bonding, Physical Properties and Stereochemistry-I		PP, DM	15	25
		Thermodynamics-I and Chemical Kinetics-I		DJ	15	25
	CC1-3-P	Acid-base titration, Oxidation-Reduction titrimetry		PP, BH	30	25
MDC	CHEM-MD-CC3-3-Th	Organic Chemistry	Module-1	DM	20	25
			Module-2	PP	15	25
			Module-3	DM	15	25
	CHEM-MD-CC3-3-P	Identification of pure single Organic Compound		DM, PP	30	25
	CHEM-MD-SEC-Th	Chemistry in Daily Life - Theory	Module-1	PP	45	75
			Module-2	DM		
			Module-3	DJ		
	CHEM-MD-SEC-Tu	Chemistry in Daily Life - Tutorial	Estimation of Vitamin C	PP, DM, DJ	15	25
			Determination of saponification number of oil.			
			Determination of Iodine number of oil.			
	CHEM-MD-IDC3-Th	Quantitative Analysis and Basic Laboratory Practices	DJ, BH, BG	45	75	CHEM-H-IDC3-3-Th
	CHEM-MD-IDC3-3-Tu	-Do-	-Do-	30	25	CHEM-H-IDC3-3-Tu

DEPARTMENTAL MEETINGS

Major Departmental meetings are held thrice a year at least where lesson plan, examination related responsibilities, answer script evaluation, webinar/seminar/industry visit planning etc. take place. Except that, departmental meetings are also held periodically to address any issue related to academics time to time.

INTERNAL EVALUATION

Periodic class tests are undertaken to understand the preparedness of the students.

MEASURES FOR SLOW LEARNERS

Some extra classes are arranged on demand and additional class notes are provided to help the slow learners.

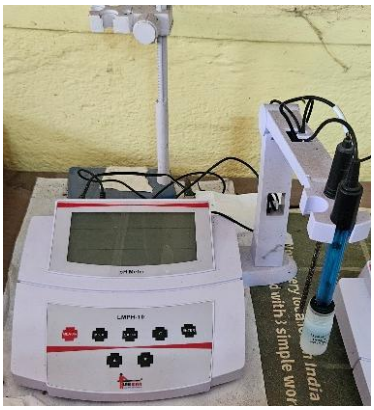
STUDENT ACHIEVERS

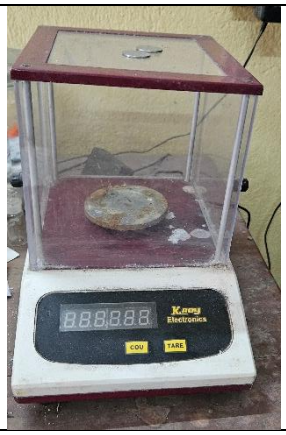
Being a new Honours department, first batch of students have just passed B.Sc Honours in 2023-24 session.

LIST OF EQUIPMENTS AND THEIR SPECIFICATIONS

Name of the equipment	Manufacturer/Distributer	Specifications
UV-visible spectrophotometer	LABMAN Scientific instruments  	LABMAN Lcd LMSP-UV1200 Single Beam UV-VISIBLE Spectrophotometer Product Specification: Wavelength Range 190-1100 nm Mobility Portable Spectral Bandwidth 2 nm Display LCD Optical System Single Beam, Grating 1200 lines / mm Brand LABMAN Model Name/Number LMSP-UV1200 Baseline Flatness +- 0.002A/h Data Output Port USB Cell Holder 10 mm 4 Position Cuvette Holder Dimensions 460 x 360 x 225 mm Printer Port Parallel Port Wavelength Repeatability +-0.2 nm Wavelength Accuracy +-0.8 nm Stability +- 0.002A/h @ 500nm Weight 18 kg Lamps D2 Lamp & Tungsten Halogen Lamp (W Lamp) Detector Silicon Photodiode Band Width 2 nm Features: Numerical Keys: Microprocessor controlled, all parameters of this instrument can be easily set by numerical keys. 8 mm Thick Optical Base: The instruments use a rigid die-cast aluminum base as its optical mount to ensure instrument stability and reliability. Standard Curve: Can set up various standard curves according to customer's solutions and find the concentration of unknown solutions. Auto Setting Wavelength: Users set wavelength automatically through arrow keys to avoid operation errors. Data Output: LMSP -UV1200 is equipped with USB port to connect with a PC to display spectrum scanning, kinetics and multi wavelength testing results on the screen through the optional software.

Fluorescence Spectrometer	Lasany  	Model Name/Number of Fluorescence Spectrophotometer: L1-4100 Brand: Lasany Wavelength Range 200-900 nm High sensitivity, High optical performance Emission Band Width 10 nm Sensitivity -S/N≥150 Linear >_0.995 Power Requirement 220V+-22V 50Hz +-1Hz Stability better than 1.5%/10min Fluorescence display value ; 0.00-600.00 Light Source Hamamatsu 150W Xenon lamp long life. Country of Origin Made in India EMISSION MONOCHROMATOR CT diffraction grating. data collection soft wire. pc. base. <u>Product Description</u> Fluorescence Spectrophotometer Two mode could be chosen: fluorescence intensity and luminous intensity. Fluorescence scanning, kinetic determination and quantity analysis could be done under fluorescence intensity mode. 365nm exciting wavelength Raman peak of water in 1 cm quartz fluorescence cuvette S/N≥150 High performance sensitivity simplifies the measurement of low detective sample. High stable and long life 150W xenon lamp and power source ensure high stable testing and wide range of spectrum.
Digital potentiometer	Systonic  	Potentiometer is a precision instrument for potentiometric measurements. Results are displayed in millivolts on a direct digital readout. It is supplied with a set of relevant electrodes. Resistance Range: 0 to +/- 1999 mV Voltage: 230 V, +/- 10% AC, 50 Hz Resolution: 0.1 mV

Digital pH meter	 LABMAN Scientific instruments	Model no. LMPH 10 Range 0.0 to 14.0 pH Accuracy ±0.01 pH pH buffer options pH 4, 7, 10 mV range ±1999 MV
Digital conductivity meter	LABMAN Scientific instruments 	Model no. LMCM 20 Conductivity range: 0-20.0, 200, 2000µS/cm; 20.0, 200.0mS/cm Conductivity resolution: 0.01, 0.1, 1 Conductivity accuracy: ±0.5% F.S.
Melting point apparatus	Custom made 	Key Features: The Temperature is Regulated by Energy Regulator Fitted to the Unit. The Lamp Provides Uniform & Shadow Less Regulator Fitted to the Unit. Supplied without Capillary Tubes & Thermometer. ELECTRICALLY OPERATED
Hot air oven	Custom made 	Operates between room temperature to 80 °C Temperature fluctuation: ±3 °C

Digital balance		Maximum capacity : 220 g Readability 0.1 mg

SWOC ANALYSIS OF THE DEPARTMENT

STRENGTH	WEAKNESS
Committed faculty	Only one sanctioned post for full-time teacher
Proper utilization of laboratory facilities and other resources	Lack of infrastructure
Seminars, industry visit etc	Lack of Departmental library and especially books for Honours courses
	Lack of classroom
	Lack of computer for day-to-day work
	No proper separate laboratory for wet chemical lab and instrument lab

OPPORTUNITIES	CHALLENGES
➢ Creating a departmental library and adding more books both for General and Honours courses covering the entire syllabus ➢ Opportunities are there for the students who would like to do research.	➢ Keeping in mind, most of the things used in Chemistry lab are consumable in nature, chemicals and other consumable items need to be procured time to time. For the routine instrument-based experiments, more than one instrument should be procured. ➢ Getting academically strong and motivated students and increased number of students in Honours courses is really challenging. Even though few number of students get admitted, even lesser students go for registration. So, practically speaking, the result is not satisfactory.

CONCLUSION

The department of Chemistry expresses its deepest gratitude to our honorable Teacher in-charge, Dr. Debprasad Mandal and our fellow faculty members and colleagues for their support and whole-hearted cooperation.

Our objective is to lead our students to light the candle of higher education in an area of daily wage-earners. We hence forth look forward to the kind consideration of the government for promoting us to build a better future for the new generation.

It’s a great honor to have the opportunity to offer thanks to the NAAC Peer Team for giving us their valuable time to kindly and patiently go through our departmental activities as provided in the departmental profile.

Thanks to the honourable NAAC Peer Team for their visit to our department. In anticipation and soliciting necessary help for betterment of the department as well as the college.