DEPARTMENT OF CHEMISTRY
SIKSHA BHAVANA (INSTITUTE OF SCIENCE)
VISVA-BHARATI
SANTINIKETAN

INTERNSHIP IN CHEMISTRY (2025-2026)

Duration: 120 Credit Hours

No accommodation will be provided.

Last Date of enrolment: 10th June, 2025

Contact details of Co-ordinator

Dr. Dhrubajyoti Mondal
Assistant Professor
Department of Chemistry
Visva-Bharati, Santiniketan – 731235
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Code and Subject Domain of the Internship Programme (IP)

Internship CODE	Name of the Mentor	Subject Domain (Title of the UG Internship Programme)
IP-I1	Prof. Asim Kumar Das Email. asimkumar.das@visva-bharati.ac.in	**Inorganic Chemistry** *Nanotechnology of Colours*
IP-I2	Prof. Pranesh Chowdhury Email. pranesh.chowdhury@visva-bharati.ac.in	**Inorganic Chemistry** *Schiff base photochromic complex and Fluorescent Polymer*
IP-P1	Prof. Pranab Sarkar Email. pranab.sarkar@visva-bharati.ac.in	**Physical Chemistry** *Computational Chemistry*
IP-O1	Prof. Goutam Brahmachari Email. goutam.brahmachari@visva-bharati.ac.in	**Organic Chemistry** *Organic Synthesis: Practice of Green and Sustainable Chemistry*
IP-O2	Prof. Gourab Kanti Das Email. gourabkanti.das@visva-bharati.ac.in	**Organic Chemistry** *Reaction Modeling*
IP-I3	Prof. Bijoy Krishna Dolui Email. bijoy_dolui@yahoo.co.in	**Inorganic Chemistry** *Review on Solvation phenomena of some biochemically important molecules in aqueous ionic binary solvent mixtures*
IP-O3	Prof. Adinath Majee Email. adinath.majee@visva-bharati.ac.in	**Organic Chemistry** *Synthetic organic Methodologies*
IP-P2	Dr. Bidhan Chandra Bag Email. bidhanchandra.bag@visva-bharati.ac.in	**Physical Chemistry** *Determination of non-equilibrium temperature*
IP-P3	Dr. Manas Ghosh Email. pcmg77@gmail.com	**Physical Chemistry** *Review works on low dimensional systems*
IP-O4	Dr. Alakananda Hajra Email. alakananda.hajra@visva-bharati.ac.in	**Organic Chemistry** *Synthetic organic chemistry*
IP-O5	Dr. Naznin Ara Begum Email. naznin.begum@visva-bharati.ac.in	**Organic Chemistry** *Form Lab to Life: Decoding Role of Small Molecules*
IP-P4	Dr. Bula Singh Email. bula.singh@visva-bharati.ac.in	**Physical Chemistry** *Synthesis, characterization and study the bioactivity of the complex*

IP-I4	Dr. Md Motin Seikh Email. mdmotin.seikh@visva-bharati.ac.in	**Inorganic Chemistry** *Materials Chemistry and Nanochemistry*
IP-O6	Dr. Kartick Chandra Bhowmick Email. kartickc.bhowmick@visva-bharati.ac.in	**Organic Chemistry** *Isolation and purification of synthesized organic products*
IP-I5	Dr. Biswajit Dey Email. bdeychem@gmail.com	**Inorganic Chemistry** *Supramolecular Chemistry*
IP-P5	Dr. Sudip Kumar Mondal Email. sudip.mondal@visva-bharati.ac.in	**Physical Chemistry** *A Training on UV-Visible Absorption and Emission Spectroscopic Techniques*
IP-O7	Dr. Prithidipa Sahoo Email. prithidipa.sahoo@visva-bharati.ac.in	**Organic Chemistry** *Development of fluorescent sensors for the sustainable environment*
IP-P6	Dr. Biplab Rajbanshi Email. biplab.rajbanshi@visva-bharati.ac.in	**Physical Chemistry** *Computational exploration of nanomaterials using DFT*
IP-P7	Dr. Sourav Banerjee Email. sourav.banerjee@visva-bharati.ac.in	**Physical Chemistry** *Computational Study on Multistate Energy Decomposition Analysis of Molecular Excited States via DFT*
IP-O8	Dr. Pradip Dey Email. pradip.dey@visva-bharati.ac.in	**Organic Chemistry** *Synthetic Polymer Chemistry*
IP-I6	Dr. Dhrubajyoti Mondal Email. dhrubajyoti.mondal@visva-bharati.ac.in	**Inorganic Chemistry** *Coordination Chemistry of Transition Metal Complexes*

STEP BY STEP PROCEDURE FOR ENROLMENT

- **Fill in the Google Form and submit within 10th June, 2025. Link in given below.**

- **Google Form Link:**

  https://docs.google.com/forms/d/e/1FAIpQLSdJo0a8KrRB0YpIPEaUCuMt9upi70fPjDcrNbLNcSr6FwwqfA/viewform?usp=header

(Fill out carefully the **domain** and **code** of the internship programme. **If you face any difficulty in clicking the link, then copy and paste the link into Google to open the form.)**

- **Shortlisted candidates will be notified with payment link by email to make payment within 15th June, 2025.**

DETAILS OF THE INTERNSHIP PROGRAMME

Domain: Inorganic Chemistry

Title of the Internship Programme: Internship Programme on Inorganic Chemistry (Code: IP-I1, IP-I2, IP-I3, IP-I4, IP-I5 and IP-I6).

Nature of the Internship Programme: Research-based for developing research aptitude

Description of the internship programme (200 words): This internship program offers a multidisciplinary exploration at the intersection of materials chemistry, coordination chemistry, nanotechnology, and molecular design. Participants can gather knowledge in **nanotechnology of colors (IP-I1)**, where nanoscale structures manipulate light to produce vibrant, tunable hues without pigments. The program also contains chemistry of **Schiff base photochromic complexes (IP-I2)**, highlighting their reversible light-induced transformations and potential in smart materials. Interns also study **fluorescent polymers**, focusing on their synthesis and applications in sensing and imaging.

The program includes a **review of solvation phenomena (IP-I3)** involving biochemically important molecules in aqueous ionic binary mixtures, providing critical insights into solvent–solute interactions and their implications in biochemical processes. In the field of **supramolecular chemistry (IP-I4)**, students can explore non-covalent interactions and self-assembly strategies to create complex architectures. The **materials chemistry and nanochemistry (IP-I5)** is offering hands-on experience in designing, synthesizing, and characterizing novel functional materials. A strong emphasis is placed on **coordination chemistry of transition metal complexes (IP-I6)**, particularly their structural diversity and functional roles in catalysis and materials development.

Objective (Bulleted form):

- **IP-I1:** To explore the nanotechnology of colours by understanding how nanostructures interact with light.
- **IP-I2:** To develop practical skills in synthesizing and characterizing Schiff base photochromic complexes and fluorescent polymers, including safety practices and comprehensive literature reviews.
- **IP-I3:** To investigate solvation phenomena of biochemically important molecules through literature analysis, experimental studies, data collection, interpretation, and scientific discussion.
- **IP-I4:** To cultivate a strong research aptitude in materials chemistry and nanochemistry for growing the research aptitude in young minds.
- **IP-I5:** Basic understanding of the background and advances of supramolecular chemistry functional supramolecular systems like gel and crystal supramolecule-based device fabrication, and its practical uses for real.
- **IP-I6:** To gain hands-on experience in the coordination chemistry of transition metal complexes, involving ligand design, complex synthesis, and advanced spectroscopic characterization (UV-Vis, IR, NMR, HRMS, etc.).

Duration: 120 Hours

Mode of Internship Programme: Blended

Minimum Eligibility Criteria: 4th SEM UG students of any discipline.

Date of Start and Closure of the Internship Programme: Summer Vacation of Visva-Bharati

Total intake of Intern/ Slot: IP-I1 (2), IP-I2 (4), IP-I3 (1), IP-I4 (3), IP-I5 (10), IP-I6 (3) (Total: 23)

Selection Process: Through an interview or by confirmation through email, or by a Telephonic Conversation

Place of Internship: Department of Chemistry, Visva-Bharati

Logistics (minimum) to be provided, if any:

Fee to be paid: ₹ 2000 /-

Contact details of the Co-ordinator: Dr. Dhrubajyoti Mondal, Assistant Professor, Department of Chemistry, Visva-Bharati.

Contact details of Internship Supervisor: Prof. Pranesh Chowdhury, Professor, Department of Chemistry, Visva-Bharati.

Domain: Organic Chemistry

Title of the Internship Programme: Internship Programme on Organic Chemistry (Code: IP-O1, IP-O2, IP-O3, IP-O4, IP-O5, IP-O6 and IP-O7).

Nature of the Internship Programme: Research-based for developing research aptitude

Description of the internship programme (200 words): Organic molecules, the foundation of countless biological processes and innovations, are critical in drug discovery, sustainable agriculture, and industrial biotechnology. This undergraduate internship program bridges the gap between theoretical research (**IP-O2**) and real-world applications, offering students a dynamic platform to explore the multifaceted roles of these organic compounds. Participants engage in hands-on laboratory experiments to unravel the mechanisms by which small molecules (**IP-O5**) or large macromolecules (**IP-O8**) interact with biological systems, influence disease pathways, and drive technological advancements.

The program emphasizes skill development in cutting-edge techniques such as synthesis (**IP-O1, IP-O3, IP-O4, IP-O6**), Spectroscopy, chromatography, and molecular docking, equipping students with the tools to analyze and design molecules with precision (**IP-O5, IP-O7**). The interns can contribute to synthesizing novel therapeutics using greener approaches, eco-friendly agrochemicals, or bio-based materials. By fostering critical thinking and problem-solving, the internship enhances technical expertise. It cultivates a holistic understanding of how molecular science translates into societal benefits such as sensor development (**IP-O7**) and drug delivery applications **(IP-O5, IP-O8).**

In summary, this internship will prepare the next generation of scientists to address global challenges, empowering them to transform innovative research into solutions that improve human health, sustainability, and quality of life.

Objective (Bulleted form):

- **IP-O1:** Hands-on training on various instruments and techniques in green chemistry-driven organic synthesis. Development of laboratory skills and training in analyzing physical tools (viz. spectroscopic tools such as UV, FTIR, NMR, and HRMS) in determining chemical structures
- **IP-O2:** Computational Chemistry can be used to validate the organic reaction mechanism. The geometries of the reactant, transition state, intermediate, and products will be optimized using quantum mechanical methods, and the potential energy surface will be drawn using the energy of the stationary points. This method can be utilized to determine a reaction's feasibility and predict the stereo and regio-selectivity of the reaction.
- **IP-O3:** Synthesis and characterization of organic compounds which are biologically active using new methodologies with special emphasis on green chemistry using Organocatalytic processes

- **IP-O4:** Synthesis and functionalization of organic compounds, such as heterocycles, using new methodologies such as electrochemistry, visible light, etc.
- **IP-O5:** Design and synthesis of small molecules. Understanding their photophysical and biological activities. Addressing the Translational Challenges, i.e., identifying the barriers in scaling laboratory discoveries and propose strategies to enhance the practical implementation of small molecule technologies
- **IP-O6:** To enhance the skill in isolating and purifying organic chemicals after organic synthesis. To impart knowledge on the characterization of organic products by various spectroscopic techniques.
- **IP-O7:** Development of a Smart Nanosensor for detecting Neurotransmitters, adulterating in Food Safety Platforms, Disease Biomarkers, etc. In addition, a road map will be prepared for commercialization.
- **IP-O8:** Synthesis and characterization of amphiphilic polymers based polythiourethanes, polypeptides, etc. Study the self-assembly of the amphiphilic polymers. Develop a skillset to design a nanocarrier for drug delivery applications.

In all the above-mentioned projects, the common objective is to train and enhance employability of an undergraduate student for chemical industries, enhance their research aptitude, and motivate them to pursue academics in higher education.

Duration: 120 Hours

Mode of Internship Programme: Blended

Minimum Eligibility Criteria: 4th SEM UG students of any discipline.

Date of Start and Closure of the Internship Programme: Summer Vacation of Visva-Bharati

Total intake of Intern/ Slot: IP-O1 (2), IP-O2 (1), IP-O3 (2), IP-O4 (2), IP-O5 (2), IP-O6 (4), O7 (2), IP-O8 (1) (Total: 16)

Selection Process: Through an interview or by confirmation through email, or by a Telephonic Conversation

Place of Internship: Department of Chemistry, Visva-Bharati

Logistics (minimum) to be provided, if any:

Fee to be paid: ₹ 2000 /-

Contact details of the Co-ordinator: Dr. Dhrubajyoti Mondal, Assistant Professor, Department of Chemistry, Visva-Bharati.

Contact details of Internship Supervisor: Prof. Goutam Brahmachari, Professor, Department of Chemistry, Visva-Bharati.

Domain: Physical Chemistry

Title of the Internship Programme: Internship Programme on Physical Chemistry (Code: IP-P1, IP-P2, IP-P3, IP-P4, IP-P5, IP-P6 and IP-P7).

Nature of the Internship Programme: Research-based for developing research aptitude

Description of the internship programme (200 words): The program offers a multidisciplinary experimental as well as theoretical and computational aspects of physical chemistry. It can provide the opportunity to develop the basic concept of computational chemistry (**IP-P1**). Participants can gather comprehensive theoretical knowledge for calculating thermodynamic properties at steady state (**IP-P2**). Students can also develop a basic understanding of nonlinear optical properties of various low-dimensional quantum mechanical systems (**IP-P3**). Interns will also get an opportunity to synthesize different complexes, characterize them using different spectroscopic tools, and study their bioactivity such as interaction with biopolymer, antibiotic activity, antioxidant activity, etc. (**IP-P4)**. The program also provides a hand-on training on UV-Visible absorption and emission spectroscopic techniques (**IP-P5**). Students can also explore the electronic properties of different low-dimensional contemporary nanomaterials and their versatile applications using DFT (**IP-P6**). Students will be taught basic computational software to do the calculations for predicting photo-physical properties of some organic molecules using quantum mechanical DFT calculation (**IP-P7**).

Objective (Bulleted form):

- **IP-P1:** To introduce students the basics of computational chemistry.
- **IP-P2:** Learning to calculate thermodynamic properties at steady state.
- **IP-P3:** To gain a basic understanding of nonlinear optical properties of various low-dimensional systems such as quantum dots, quantum wire, quantum well, etc.
- **IP-P4:** To develop practical skills in synthesis, characterization using different spectroscopic method, and study of bioactivity of the complex materials.
- **IP-P5:** To provide hand-on training on UV-Visible absorption and emission spectroscopic techniques.
- **IP-P6:** To explore the electronic properties of low-dimensional nanomaterials and their applications using DFT.
- **IP-P7:** To understand molecular complex systems, predicting their photophysical properties, and facilitating computational studies using MSDFT analysis.

Duration: 120 Hours

Mode of Internship Programme: Blended

Minimum Eligibility Criteria: 4th SEM UG students of any discipline.

Date of Start and Closure of the Internship Programme: Summer Vacation of Visva-Bharati

Total intake of Intern/ Slot: IP-P1 (1), IP-P2 (2), IP-P3 (1), IP-P4 (2), IP-P5 (2), IP-P6 (3), IP-P7 (5) (Total: 16)

Selection Process: Through an interview or by confirmation through email, or by a Telephonic Conversation

Place of Internship: Department of Chemistry, Visva-Bharati

Logistics (minimum) to be provided, if any:

Fee to be paid: ₹ 2000 /-

Contact details of the Co-ordinator: Dr. Dhrubajyoti Mondal, Assistant Professor, Department of Chemistry, Visva-Bharati.

Contact details of Internship Supervisor: Prof. Pranab Sarkar, Professor, Department of Chemistry, Visva-Bharati.

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