

**National Initiative on Undergraduate Science (Chemistry)**  
**Exposure-cum-enrichment Camp – Batch XIX.I**  
**December 21 – 30, 2023**

National Initiative on Undergraduate Studies (NIUS) exposure camp in chemistry, a major initiative of HBCSE-TIFR, was organized in the month of December 2023 for 2<sup>nd</sup> year undergraduate students from different colleges across India. The camp presented comprehensive exposure about the domain of chemistry and the general scientific competencies through interactive theoretical sessions (core and advanced areas), workshops/group activities related to experiments, reading research papers, scientific writing, computational chemistry, understanding concepts using guided inquiry approach based instructional material, introduction to discipline-based educational research, and gender aspects related to science.

The camp was held at HBCSE during December 21 – 30, 2023. A total of 50 students were stationed at campus. Moodle accounts were generated for each participant through which they were able to access every information regarding the camp. Diverse sessions were conducted by external resource persons from institutes in Mumbai and Pune and members of chemistry group at HBCSE.

The sessions explored wide range of topics such as understanding quantum chemistry, (Infosys lectures on) astronomy and artificial intelligence, interfacial chemistry and related experimental techniques, assigning protein functions using chemical proteomics, learning spectroscopy through problem solving, understanding electrode potential in electrochemistry, periodic table of elements, conformation and reactivity of organic compounds, basic concepts of coordination chemistry with an introduction to bioinorganic chemistry, history of Vitamin C and its journey along with humanity, and scale-up of chemical processes from lab to industry. Assignments were given to students which were submitted through Moodle.

Apart from above mentioned theoretical sessions, there were complementary workshop session such as understanding scientific writing, learning concepts through inquiry based approach using Process Oriented Guided Inquiry Learning (POGIL). Introduction of computational chemistry lab, reading and comprehending a research paper, and planning of experiment were also conducted. Along with this, there was session on gender and STEM identity in the Indian context.

The experimental sessions (conducted in groups) helped students in appreciating the usefulness of having pre and post lab questions for better understanding of experiments. The experiments discussed with the students were: a) Exploring the chemistry of Antacids b) Identification and determination of concentration of unknown acids c) Potentiometric titration of hydrogen peroxide with potassium permanganate and d) Revisiting Werner's experiments to understand Coordination Compounds. Each group of students presented posters on their respective experiments performed by them. After all, there was feedback session in the end where the students shared their learning and suggestions with everyone.

The main aim of NIUS camp is to expose and excite undergraduate students towards the diverse areas in chemistry. The interactions of students with the teachers and researchers from various institutions motivate and inspire the students to pursue chemistry and build a career in the respective field.