ASHOKA UNIVERSITY

The Department of Chemistry

Student Handbook

Currently Under Revision (As of August 2025)

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Chemistry at Ashoka

The Chemistry curriculum in the undergraduate program at Ashoka University has been meticulously designed to **cater to students of all levels**. The benefits of the programme extend beyond those pursuing a major in Chemistry, thereby reaching individuals interested in a minor, concentration, or even those with a general curiosity about the subject. The core emphasis of this syllabus is to foster a comprehensive understanding of Chemistry among all students.

Chemistry occupies a fundamental role in our daily lives, transcending the boundaries of one's profession. Ordinary activities like cooking, baking, using household products, or taking medication inherently involve chemical processes. The study of Chemistry provides insights into molecular intricacies, a grasp of chemical bonding, and a vivid comprehension of bond formation and rupture, encapsulating the entirety of a reaction. At Ashoka, our mission involves teaching Chemistry through an **integrative and holistic approach** that intersects with other scientific domains, including Physics, Biology, Computer Science, and Environmental Science. Our consistent effort is to establish meaningful connections with these disciplines, thus nurturing the diverse interests of our students. We are eagerly anticipating the department's integral role in shaping the fabric of Ashoka University in the near future.

Moreover, the Department of Chemistry is devoted to advancing innovative and contemporary research. Successful chemistry research is built upon a strong foundation of fundamental principles. Our aim is to **nurture your potential** as an aspiring researcher by grounding you in the essential concepts of Organic, Inorganic, and Physical Chemistry during this semester. We hold great confidence that this knowledge will serve as a catalyst for your success across various fields of science and humanities.

The Undergraduate Major, Minor and Concentration

The **Chemistry major** at Ashoka University is crafted with the fundamental belief that acquiring a degree in chemistry equips students to chart their own trajectories, be it within academia, industry, immediate professional pursuits, or continued exploration in the realm of chemistry or related fields. This program offers something valuable for every individual, ensuring a pathway tailored to their aspirations and ambitions.

With the New Education Policy (NEP) in place, students may choose to graduate after their **third year or fourth year** with a *BSc honours in Chemistry* or in **their fourth year** with a *BSc honours* or *BSc honours with Research degree*. In order to graduate with a Chemistry degree from Ashoka University, students would complete a certain number of mandatory courses, core courses, lab courses and electives over the 3 or 4 years. Courses offered by the Department of Chemistry or cross-listed with this department will be included. The fourth year students must audit the Seminar Series course and **can then pursue independent research in the department**. The **Topics in Chemistry** course and the **Introductory Chemistry Laboratory** Course are gateway courses that Chemistry majors and minors are expected to register for in their second semester. Students who have not studied Chemistry in high school are expected to register for the 2 credit **Chemistry for Beginners** course to supplement their understanding of the other gateway courses.

To pursue a **minor** in Chemistry at Ashoka, students must take **6 courses** that are either offered by, or cross-listed with the Department of Chemistry. To pursue a **concentration** in Chemistry, students must complete a minimum of **4 courses.** Details on the courses and recommended trajectory alongside the prerequisites can be found further into this document.

Please note that an ISM or *Independent Study Module* is a 2 credit or 4 credit course (if 4 credit, it can act as an elective) that a student may take up directly with a professor. This allows a student to work directly with a professor on a topic outside of the courses offered in a semester.

3 Year Major Course Requirements

Section 1. The **mandatory** courses for the 3 year Chemistry major are as follows:

1. *CHM-1501- Topics in Chemistry*
2. *CHM-1020- Introductory Physical Chemistry*
3. *CHM-1101- Concepts in Organic Chemistry*
4. *CHM-1159- Introductory Inorganic Chemistry*
5. *Advanced ISM (I) (ISM should be an advanced-level course of organic/inorganic/physical chemistry).*

Section 2. Choose **any 3** core courses from the following:

1. *CHM-3212- Energetics and Rate of Reactions*
2. *CHM-1201/CHM-2100 - Atoms, Quanta and Light*
3. *CHM-2003/CHM-4003 - Inorganic Chemistry*
4. *CHM-2012/CHM-4012 - Organic Chemistry*
5. *CHM-3214 - Stereochemistry and Heterocyclic Chemistry*
6. *CHM-4402 - Structure Elucidation of Organic Molecules*
7. *CHM-3201 - Bioinorganic Chemistry*
8. *CHM-3120/CHM-4407/CHM-6612- Advanced Organic Chemistry*
9. *CHM-2311- Introductory Biochemistry*
10. *CHM-1005 - Chemistry for Beginners* AND *CHM-1006 - Mathematics for Chemistry*[1]

Section 3. Choose **any 4** lab courses from the following:

1. *CHM-3109 -Physical Chemistry Laboratory*
2. *CHM-1099- Introductory Chemistry Laboratory*
3. *CHM-3219 - Synthetic Chemistry Laboratory*
4. *CHM-3206 - Instrumentation Laboratory*
5. *CHM-3613/ CHM-4408/ CHM-6613- Advanced Chemistry Laboratory*

[1] As these are 2-credit courses, they will both have to be taken to make up the equivalent of one full 4-credit course.

6. *CHM-2601- Chemical Analysis Lab*

Section 4. Choose **any 4** electives from the following:

1. *CHM-3209-Medicinal Chemistry*
2. *CHM-6604/4001-Chemical Biology*
3. *CHM-3511 - Advances in Biochemistry*
4. *CHM-3213 -Smart and Biomaterials*
5. *CHM-4406/ CHM-3306 - Nanomaterials*
6. *CHM-2305/ BIO-3306 - Computational Aspects of Drug Discovery*
7. *CHM-4405/ CHM-6611/ CHM-3405-1/ PHY-4530- Group Theory and Quantum Mechanics*
8. *CHM-2013/CHM-4013 - Analytical Chemistry*
9. *CHM-3207/ CHM-4207/ CHM-6207 - Organometallics*
10. *CHM-3220- Light Matter Interactions*
11. *Biophysical Chemistry (2 Credit Course)*
12. *ISM*

To summarise,

Section	*No. of Courses Required*
1. Mandatory	4
2. Core	3
3. Laboratory	4
4. Electives	4

Total courses to be completed: *15*

Minimum number of credits: *60*

[Please note that **1 course = 4 credits**]

Students who have not studied Chemistry in classes 11th and 12th are expected to register for the 2 credit *Chemistry for Beginners* course to supplement their understanding of the *Topics in Chemistry* course.

4 Year Major Course Requirements

Basket 1. The **mandatory** courses (16 credits) for the 4-year Chemistry major are as follows: From this basket, choose any four mandatory courses as below:

1. *CHM-1501- Topics in Chemistry*
2. *CHM-1020- Introductory Physical Chemistry*
3. *CHM-1101- Concepts in Organic Chemistry*
4. *CHM-1159- Introductory Inorganic Chemistry*
5. *Advanced ISM (I) (ISM should be an advanced-level course of organic/inorganic/physical chemistry).*

Basket 2. Choose **any 5** core courses (20 credits) from this basket as below:

List of credit courses:

1. *CHM-3212- Energetics and Rate of Reactions*
2. *CHM-1201/CHM-2100 - Atoms, Quanta and Light*
3. *CHM-2003/CHM-4003 - Inorganic Chemistry*
4. *CHM-2012/CHM-4012 - Organic Chemistry*
5. *CHM-3214 - Stereochemistry and Heterocyclic Chemistry*
6. *CHM-4402 - Structure Elucidation of Organic Molecules*
7. *CHM-3201 - Bioinorganic Chemistry*
8. *CHM-3120/CHM-4407/CHM-6612- Advanced Organic Chemistry*
9. *CHM-2311- Introductory Biochemistry*
10. *CHM-1005 - Chemistry for Beginners (2 credit course)*
11. *CHM-1006 - Mathematics for Chemistry (2 credit course)*
12. *ISM II (2/4 credit)*
13. *Solid State Chemistry*
14. *Industrial Chemistry*

Basket 3. Choose **any 4** lab courses (16 credits) from this basket as below:

Please note **CHM-1099- Introductory Chemistry Laboratory is a mandatory lab course.**

1. *CHM-1099- Introductory Chemistry Laboratory*
2. *CHM-3109 -Physical Chemistry Laboratory*
3. *CHM-3219 - Synthetic Chemistry Laboratory*
4. *CHM-3206/ CHM-4206/ CHM-6206 - Instrumentation Laboratory*
5. *CHM-3613/ CHM-4408/ CHM-6613- Advanced Chemistry Laboratory*
6. *CHM-3210/ CHM-2601/ CHM-4208 - Chemical Analysis Lab*

Basket 4. Choose **any 7** electives (28 credits) from this basket as below:

(All 4 credit courses)

1. *CHM-3209-Medicinal Chemistry*
2. *CHM-6604/4001-Chemical Biology*
3. *CHM-3511 - Advances in Biochemistry*
4. *CHM-3213 -Smart and Biomaterials*
5. *CHM-4406/ CHM-3306 - Nanomaterials*
6. *CHM-2305/ BIO-3306 - Computational Aspects of Drug Discovery*
7. *CHM-4405/ CHM-6611/ CHM-3405-1/ PHY-4530- Group Theory and Quantum Mechanics*
8. *CHM-2013/CHM-4013 - Analytical Chemistry*
9. *CHM-3207/ CHM-4207/ CHM-6207 - Organometallics*
10. *CHM-3220- Light Matter Interactions*
11. *CHM-4401 - Applications of Computational Chemistry*
12. *Advanced ISM*

To summarise,

Section	*No. of Credits Required*
1. Mandatory	16
2. Core	20
3. Laboratory	16
4. Electives	28

Total courses to be completed: *20*

Minimum number of credits: *80*

[Please note that **1 course = 4 credits**]

To graduate after four years with a ***BSc honours With Research*** in Chemistry instead of the *BSc honours in Chemistry* degree, students must complete 3 additional research courses (i.e. 12 credits) in their final year. This would involve independent research supported by a professor and culminated with a thesis. Further, *CHM-6607/4409- Seminar Series* is a **mandatory** course for undergraduate students to **audit** in their fourth year. This will support students in understanding how research papers are written leading up to their fourth year thesis.

Further, students who have not studied Chemistry in classes 11th and 12th are expected to register for the 2 credit *Chemistry for Beginners* course to supplement their understanding of the *Topics in Chemistry* course.

Minor Course Requirements

Applicable for both 3 year and 4 year undergraduate Chemistry Minors.

Section 1. Complete **any 3** courses from the following:

1. *CHM-1501- Topics in Chemistry*
2. *CHM-1020- Introductory Physical Chemistry*
3. *CHM-1101- Concepts in Organic Chemistry*
4. *CHM-1159- Introductory Inorganic Chemistry*
5. *CHM-3212 - Energetics and Rate of Reactions*
6. *CHM- 1201/2100- Atoms, Quanta and Light*
7. *CHM-3214 - Stereochemistry and Heterocyclic Chemistry*
8. *CHM-4402 - Structure Elucidation of Organic Molecules*
9. *CHM-3201 - Bioinorganic Chemistry*
10. *CHM-3120/CHM-4407/CHM-6612- Advanced Organic Chemistry*
11. *CHM-2311- Introductory Biochemistry*
12. *CHM-2003/CHM-4003 - Inorganic Chemistry*
13. *CHM-2012/CHM-4012 - Organic Chemistry*
14. *CHM-1005 - Chemistry for Beginners* AND *CHM-1006 - Mathematics for Chemistry*[2]

Section 2. Choose **any 2** lab courses from the following 5 courses:

1. *CHM-3109 -Physical Chemistry Laboratory*
2. *CHM-1099- Introductory Chemistry Laboratory*
3. *CHM-3219 - Synthetic Chemistry Laboratory*
4. *CHM-3206 - Instrumentation Laboratory*
5. *CHM-3613/ CHM-4408/ CHM-6613- Advanced Chemistry Laboratory*
6. *CHM-2601- Chemical Analysis Lab*

Section 3. Choose **any 1** elective from the following:

1. *CHM-3209-Medicinal Chemistry*

[2] As these are 2-credit courses, they will both have to be taken to make up the equivalent of one full 4-credit course.

2. *CHM-6604/4001-Chemical Biology*
3. *CHM-3511 - Advances in Biochemistry*
4. *CHM-3213 -Smart and Biomaterials*
5. *CHM-4406/ CHM-3306 - Nanomaterials*
6. *CHM-2305/ BIO-3306 - Computational Aspects of Drug Discovery*
7. *CHM-4405/CHM-6611/CHM-3405-1/PHY-4530 - Group Theory and Quantum Mechanics*
8. *CHM-2013/CHM-4013 - Analytical Chemistry*
9. *CHM-3207/ CHM-4207/ CHM-6207 - Organometallics*
10. *CHM-3220- Light Matter Interactions*
11. *ISM*

To summarise,

Section	*No. of Courses Required*
1. Core	3
2. Laboratory	2
3. Electives	1

Total courses to be completed: *6*

Minimum number of credits: *24*

[Please note that **1 course = 4 credits**]

A maximum of 2 cross-listed (8 credits) courses are allowed.

Students who have not studied Chemistry in classes 11th and 12th are expected to register for the 2 credit *Chemistry for Beginners* course to supplement their understanding of the *Topics in Chemistry* course.

Concentration Course Requirements

Applicable for both 3 year and 4 year undergraduate Chemistry Concentrations.

Section 1. Complete **any 3** courses from the following:

1. *CHM-1501- Topics in Chemistry*
2. *CHM-1020- Introductory Physical Chemistry*
3. *CHM-1101- Concepts in Organic Chemistry*
4. *CHM-1159- Introductory Inorganic Chemistry*
5. *CHM-3212 - Energetics and Rate of Reactions*
6. *CHM- 1201/2100- Atoms, Quanta and Light*
7. *CHM-3214 - Stereochemistry and Heterocyclic Chemistry*
8. *CHM-4402 - Structure Elucidation of Organic Molecules*
9. *CHM-3201 - Bioinorganic Chemistry*
10. *CHM-3120/CHM-4407/CHM-6612- Advanced Organic Chemistry*
11. *CHM-2311- Introductory Biochemistry*
12. *CHM-2003/CHM-4003 - Inorganic Chemistry*
13. *CHM-2012/CHM-4012 - Organic Chemistry*
14. *CHM-1005 - Chemistry for Beginners* AND *CHM-1006 - Mathematics for Chemistry*
15. *CHM-3109 -Physical Chemistry Laboratory*
16. *CHM-1099- Introductory Chemistry Laboratory*
17. *CHM-3219 - Synthetic Chemistry Laboratory*
18. *CHM-3206 - Instrumentation Laboratory*
19. *CHM-3613/ CHM-4408/ CHM-6613- Advanced Chemistry Laboratory*
20. *CHM-2601- Chemical Analysis Lab*

Section 2. Choose **any 1** elective from the following:

1. *CHM-3209-Medicinal Chemistry*
2. *CHM-6604/4001- Chemical Biology*
3. *CHM-3511 - Advances in Biochemistry*
4. *CHM-3213 -Smart and Biomaterials*
5. *CHM-4406/ CHM-3306 - Nanomaterials*
6. *CHM-2305/ BIO-3306 - Computational Aspects of Drug Discovery*
7. *CHM-4405/ CHM-6611/ CHM-3405-1/ PHY-4530- Group Theory and Quantum Mechanics*
8. *CHM-3207/ CHM-4207/ CHM-6207 - Organometallics*

9. *CHM-3220- Light Matter Interactions*
10. *CHM-2013/CHM-4013 - Analytical Chemistry*
11. *ISM*

The Chemistry Department

Professor Sourav Pal – *Professor of Chemistry*

Education: Five-year (Integrated) M Sc in Chemistry at IIT Kanpur, PhD IACS Kolkata.

Experience: Professor Pal trained in quantum chemistry and computational sciences, worked at NCL, Pune for 33 years; Director of NCL, 2010-2015, Professor at IIT Bombay, 2015 June- 2017 Oct, Director, IISER Kolkata, Oct 2017-Oct 2022, Ashoka University, Oct 2022 onwards as Head, Deptt of Chemistry; Shanti Swarup Bhatnagar awardee, Sastra CNR Rao award 2014 among many awards/ honours, Fellow of all three National Academies of Science, DST J C Bose Fellowship from 2008-2023, Chairman and member of many scientific Committees, Chairman, BIS Chemical Division Council 2014 onwards, President, Chemical Research Society of India, 2014-2017, Founding Executive Board member, Commonwealth Chemistry 2020-2023, Executive Council of Federation of Asian Chemical Society, 2016-2020.

Field of Scientific Interest: Quantum Chemistry/ Computational material science.

Area of Research: Many-body methods, reactivity, catalysis, hydrogen storage.

Professor Vidya Dnyaneshwar Avasare - *Professor of Chemistry*

Education: MSc in Organic Chemistry, SPPU, Pune; PhD in Organometallics, IIT Bombay.

Teaching Philosophy: Dr. Avasare is a passionate teacher and researcher, driven by the belief that "transforming the life of a student is like transforming not only generations but also the strength of our nation in achieving excellence." To become a successful chemist, students must understand the logic and philosophy of fundamental subjects while developing their experimental skills. A teacher's role goes beyond facilitation; It involves mentoring, guiding inquisitive minds and nurturing their curiosity. By illuminating the path of scientific exploration, students are empowered to develop and execute innovative ideas, shaping the future of science and society.

Field of Scientific Interest: To excel in the field, Professor Avasare challenges the boundaries traditionally set within chemistry. Her scientific mission is to provide sustainable solutions to conventional, non-sustainable chemical technologies used in energy, pharmaceuticals, materials, and more. Achieving this complex objective requires a holistic understanding of chemistry, embracing its entirety to drive innovation and create impactful change.

Area of Research: Developing novel catalyst technologies. To achieve this, Professor Avasare employs a range of methods and tools, including computational and machine learning techniques, to facilitate high-throughput discovery of catalysts and CO2 capture materials. She uses these catalysts to develop new technologies in several key areas:

1. CO2 Utilisation: Converting CO2 into value-added products and chemical hydrogen storage solutions such as formic acid, methanol, ethanol, propanol, butanol, ethylene, and propylene.

2. C-N Cross-Coupling Reactions: Developing heterogeneous catalysts to produce commercially valuable aryl amines under sustainable conditions.
3. C-H Activation: Addressing this crucial challenge to streamline processes, reduce the number of steps, and minimise complex intermediates by providing sustainable, green, and atom-efficient protocols.
4. Green Hydrogen Production: Tackling this critical issue to advance sustainable hydrogen production methods.
5. Mechanistic Insights: Utilising Density Functional Theory (DFT) to unravel and understand complex chemical reaction mechanism

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Professor Munmun Ghosh - *Assistant Professor of Chemistry*

Education: Ph.D. degree in Chemical Science from National Chemical laboratory (NCL) Pune, India followed by a postdoctoral stint at Göttingen University, Germany as an Alexander von Humboldt fellow.

Experience: Dr. Munmun Ghosh was a visiting fellow at Carnegie Mellon University, USA, an Exchange student in Regensburg University Germany and worked as an intern in BASF Ludwigshafen Germany. Before joining Ashoka University as an assistant professor, she was a scientist in Reliance Industries Limited, Navi Mumbai dealing with crude oils and for a short time was a guest lecturer in Delhi University.

Field of Scientific Interest: Bioinorganic Chemistry with a focus on small molecules like water, carbon-dioxide, nitrogen activation by bioinspired molecular catalysts. For example: Hydrogenase enzymes in nature contain iron and nickel metal centres and Fe4S4 units act as electron reservoirs.

Area of Research: Synthesis of metal complexes, which are functional mimics of hydrogenase enzymes. Thorough mechanisms are studied to produce green H2 from water, value-added products like methanol, ethanol from carbon-dioxide etc.

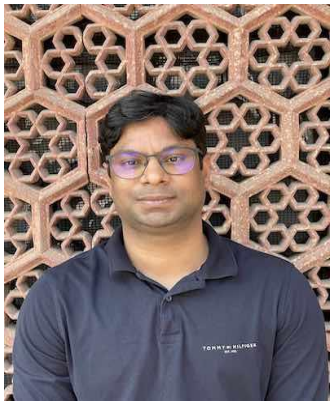
Professor Aryya Ghosh - *Assistant Professor of Chemistry*

Education: Msc in Physical Chemistry specialisation, Visva Bharati University; PhD in theoretical Chemistry, CSIR-National Chemical Laboratory (CSIR-NCL)

Experience: After successful completion of Professor Ghosh's doctoral degree developing cutting-edge electronic structure theory at CSIR-National Chemical Laboratory (CSIR-NCL) under the supervision of Prof. Sourav Pal, he pursued his first postdoctoral research in the prominent US-based group of Prof. Bowman in the area of semiclassical dynamics, specifically on the topic of roaming dynamics, a new topic of great current interest.He completed his second postdoctoral research at University of Heidelberg, Germany in the group of Prof. Lorenz S Cederbaum in the area of quantum dynamics simulation of non-radiative decay processes. At Ashoka University, he has established a new theoretical chemistry research group with four students pursuing their PhD program under his supervision.

Field of Scientific Interest: Electronic structure theory development; Ultrafast electron dynamics; Wave packet based nuclear dynamics (Quantum dynamics); Bioinformatics and Computational biology

Area of Research: Ab-initio and dynamical (semi-classical and quantum dynamics) investigation of non-radiative decay processes (Interatomic coulombic decay, electron transfer mediated decay, Auger decay, etc); Optimising therapeutic approaches through novel drug target development and accurate protein ligand binding affinity prediction in the context of human diseases.



Professor Deepak Asthana - *Assistant Professor of Chemistry*

Education: Doctoral degree (2013) from the School of Physical Sciences (SPS), Jawaharlal Nehru University (JNU), New Delhi, India;

Experience: In 2014, Professor Asthana was awarded the prestigious JSPS fellowship by the Japan Society for the Promotion of Sciences academy to pursue two years of postdoctoral research at Kyushu University, Japan. In December 2016 he joined the Molecular Magnets group at the School of Chemistry, The University of Manchester, UK and in April 2021, he joined the Chemistry Department at Ashoka University.

Field of Scientific Interest and Area of Research: Dr. Asthana's current research interests are about designing new molecular materials for light harvesting and opto-electronic applications. The primary focus is on the synthesis of ideal fluorescent systems capable of exhibiting exciting optical properties, specially, circularly polarised luminescence (CPL) and

photon up-conversion of low intensity lights. He is also interested in design and synthesis of rotaxane and catenane based materials with particular interest in systems allowing external stimuli-based mechanical activities.

Professor Sourav Chatterjee - *Assistant Professor of Chemistry*

Education: Ph.D. (Chemistry), CSIR-Indian Institute of Chemical Biology (CSIR-IICB), Kolkata, India

Experience: Postdoctoral Associate, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India; Research area: Epigenetics, histone methylation, histone acetylation. Postdoctoral Associate, The Scripps Research Institute, Florida, USA; Research area: Protein glycosylation. Postdoctoral Associate, University of Minnesota, Minneapolis, USA; Research area: Protein hydroxylation, protein engineering, enzymatic C-H halogenation.

Field of Scientific Interest: Catalysis, Chemical Biology and Medicinal Chemistry

Area of Research: Development of new catalysts and synthetic routes to prepare molecules of interest; Small molecule discovery targeting disease-associated proteins of interest; Modulation of epigenetic modifications by developing small molecules; Small molecule-based target protein degradation; Organelle selective fluorescent probe design for bioimaging applications.

Professor Santu Bera - *Assistant Professor of Chemistry*

Education: PhD, Department of Chemical Sciences, Indian Institute of Science Education and Research (IISER)-Kolkata.

Experience: After completing his Ph.D. with Prof. Debasish Haldar in 2016, Professor Santu Bera has had the great privilege to work with Professor Ehud Gazit for several years as a Postdoctoral Research Fellow in the Shmunis School of Biomedicine and Cancer Research, Faculty of Life Sciences, Tel Aviv University. In a continuous position in the Department of Oral Biology, The Goldschleger School of Dental Medicine, Tel Aviv University, he worked under Prof. Lihi Adler-Abramovich. In 2021, he was awarded the highly prestigious Marie-Sklodowska Curie fellowship by the European Research Council (ERC) and joined Prof. Gilles Guichard's peptidomimetic chemistry lab in the Institut Européen de Chimie et Biologie (IECB), Université de Bordeaux, France. He was awarded the Ramalingaswami Re-entry Fellowship by the Department of Biotechnology, Govt. of India in 2022 and the Ramanujan Fellowship from SERB, Govt. of India in 2023. Shortly after, he joined the Department of Chemistry at Ashoka University.

Field of Scientific Interest: Organic chemistry, Bioorganic and supramolecular chemistry, Biomimetics, Material Science and Nanotechnology.

Area of Research: Development of bio-inspired smart materials for nanotechnology. Nature capitalises on self-assembly to convert chemically simple building blocks into sophisticated materials that function cooperatively in living systems.

The backbone conformation and 2D, 3D structure in space of natural components is the key factor behind their specific functions. We aim to develop artificial biomimetic systems that mimic nature structurally and functionally for emerging applications in diverse areas like green energy harvesting, bioelectricity for disease treatment, catalysis, selective encapsulation, and so on.

Peer Iqbal Tariq - *Lab Superintendent*

Education: BSc-triple major in Physics, Chemistry and Mathematics; Masters in Chemistry from CU Srinagar.

At Ashoka University: Peer plays an active role in developing undergraduate chemistry labs and acts as the POC for students at ashoka. Beyond his academic responsibilities, he is deeply engaged in science exposure programs like the Young Scholars Programme (YSP) and the Lodha Genius Programme (LGP).

Document Directory

Please find all the important links below.

Document	***Links***
2024-25 Course Catalogue	Browse it
Internship Opportunities	View them here
Fourth Year Research Guidelines	Read through it

Journal Websites:

Name	***Look it up!***
The American Chemical Society	Link
Royal Society of Chemistry	Link
Nature publications	Link
Science	Link
Nature Catalysis	Link
Cell publications	Link
Indian Academy of Sciences Journal	Link

News, Education and History of Chemistry (so you stay updated):

Name	***Check it out!***
Chemistry Nobel Prize list	Link
Stories of Great Chemists	Link
3D printing for the Chemical Industry	Link
Chemical and Engineering News	Link
Chemistry World news	Link
Journal of Chemical Education	Link
Royal Society of Chemistry Education	Link

Practicals and Chemistry Software:

Name	***Try it out!***
Synthesis/Preparation of organic compounds	Link
Advanced molecule editor and visualiser	Link
ChemDoodle (for making chemical graphics)	Link
ChemSketch Freeware (draw structures, calculate properties)	Link
Quantitative/Visual quantum theory analyses from data	Link
KingDraw (chemical structure editor)	Link
List of other helpful softwares	Link

Frequently Asked Questions

You may direct your queries to the following persons of contact:

Chemistry Student Representative, **Meesha Chotai**

- chem.rep@ashoka.edu.in

UG Programme Coordinator, Vidya Dnyaneshwar Avasare

- vidya.avasare@ashoka.edu.in

Head, Department of Chemistry, Sourav Pal

- hod.che@ashoka.edu.in

Where can I find details about the different courses offered?

You can find the course descriptions on AMS under 'Manage Courses'→ 'View Course Catalogue'. By the end of September, we will be mailing the course catalogue to intended majors/minors/concentrations for ease of viewing.

Are all these courses offered every semester?

No. Some courses are offered in the monsoon semesters (first semester in the academic year) and others are offered in the spring semester (second semester in the academic year). Many courses in the chemistry department are offered every alternate monsoon or spring (i.e. every 4^{th} semester). The course catalogue to be mailed will have the course and semester mentioned.

I am interested in TA'ing for a Chemistry course. How can I apply?

If you're interested in becoming a Teaching Assistant (TA) for a Chemistry course, the process involves contacting the relevant professors either through email or in person during their office hours, based on the specific requirements of the course. Please keep in mind that TA-ships are generally offered based on the existing need for assistance in the course. Additionally, it's important to note that Ph.D. students are mandated to undertake Teaching Fellowships (TF) for courses as an integral component of their program.

I am a Biology/ Physics/ CS major. How can I navigate biochemistry, computational chemistry or Physical chemistry?

As a Biology, Physics, or CS major, you are welcome to take up courses offered that bridge your major with Chemistry such as introductory/advanced biochemistry, Computational aspects of drug discovery, Physical chemistry, etc. While deciding your courses and course trajectories, we recommend that you reach out to the subject reps, respective professors or the Head of the Department for guidance and approval.

What are cross-listed courses?

Cross listed courses refer to those that are jointly offered by multiple departments. For instance, Chemistry and Biology cross-listed courses will have course codes looking like CHM-___/BIO-___. **The list of cross-listed chemistry courses is as follows: Nanomaterials (Physics-Chemistry), Computational Aspects of Drug Discovery (Chemistry-Biology), Group Theory and Quantum Mechanics (Chemistry-Physics).** We are looking to cross list more.

Is there a recommended course trajectory for a Chemistry major? Do the chemistry courses have any prerequisites?

We would urge you to begin with the *Topics in Chemistry* theory course and *Introductory Chemistry Laboratory* course in your second semester (first year). We encourage chemistry majors to complete a minimum of 3 courses in each semester from your second semester onwards. While the trajectory depends on your choices of core courses and electives, Chemistry majors must also register for the assigned mandatory courses (*Introductory Physical Chemistry, Concepts in Organic Chemistry and Introductory Inorganic Chemistry*) and attempt one lab course in every semester. Please reach out to your subject representatives in case you would prefer personalised recommendations. There are prerequisites for certain courses and these will be updated in the Course Catalogue document.

What about research opportunities? Are Chemistry students expected to learn from hands-on experience or in the classroom? How can we get in touch with Professors to work in their labs?

There are numerous research opportunities offered for the summer. With the smaller classroom sizes and 1:1 attention offered through office hours, students learn quickly within lab classes. If interested in exploring different professors' labs, we recommend you to reach out to them directly via email.

In what research areas will the Ashoka Chemistry programme specialise in?

We are committed to fostering specialisation in various domains of Chemistry, extending into interdisciplinary realms with pure sciences. Our research offerings encompass diverse fields such as Material Science, Inorganic Chemistry, Bioinorganic Chemistry, and Theoretical and Computational Chemistry. This presents a unique opportunity for undergraduates to engage in research alongside esteemed professors, enriching their academic journey through hands-on experience and mentorship.