



LUMS
A Not-for-Profit University

Learning *Without* Borders



**IMAGINE
YOUR
FUTURE**

**MS & PhD
CHEMISTRY**
Fall 2022

Syed Babar Ali School of Science and Engineering

CREATING IMPACT THROUGH RESEARCH

The Syed Babar Ali School of Science and Engineering (SBASSE) at LUMS is taking strides in improving teaching and learning, while celebrating the novelty of research. SBASSE, through innovative and impactful contributions to science and technology, is nurturing future leaders with the potential to impact society.

SBASSE offers undergraduate, graduate and doctoral degrees in a wide range of disciplines. The MS programmes at SBASSE are rigorous and designed to impart specialised professional and research-oriented training to students. To graduate, students must accumulate a total of 30 credit hours either entirely from coursework, or by completing 24 credit hours from coursework and 6 from research work/thesis. Thus all SBASSE departments offer two options to choose from: MS-by-Coursework or MS-by-Thesis.

The SBASSE PhD programmes prepare students to think scientifically and conduct high-quality research independently. Major milestones that must be achieved for the successful completion of the PhD degree include the Coursework, Comprehensive (Qualifying) Examination, Thesis Proposal Defense, at least one peer-reviewed journal article and PhD Thesis Defense.

During the course of study, student learning takes place through lectures, tutorials, laboratories, problem-solving exercises, research projects and frequent interaction with experienced, world-class faculty members.

6
Disciplines
Biology
Chemistry
Computer Science
Electrical Engineering
Mathematics
Physics

WHY CHOOSE SBASSE

QS World University Rankings by Subject

#251	Computer Science and Information Systems
#351	Engineering – Electrical and Electronics
#382	Engineering and Technology
#501	Physics and Astronomy

KEY INITIATIVES

THE ONLY 600 MHZ NMR SPECTROMETER IN THE REGION

SBASSE's 600 MHz nuclear magnetic resonance (NMR) spectrometer can be accessed for molecular analysis. Researchers can send their samples and obtain high resolution spectra, both in one and two dimensions.

WEB PORTAL TO ACCESS ONLINE COURSES

The School's website hosts a portal that provides access to diverse online courses produced by its faculty. The offered courses range from introductory to advanced levels.

MATLAB ACCESS FOR EVERYONE

A MATLAB license for everyone working at the School including faculty, staff, researchers and students provides complete access to all of its toolboxes.

HIGH VOLTAGE ENGINEERING LABORATORY

This lab has been established to become a nursery for important work in the field of high voltage and power systems.

CLOUD CLASSROOMS

SBASSE is combining virtual classrooms with real learning by introducing a blended learning solution. Roving cameras, instructor-controlled zoom,

full wall projection of participants for maximum immersiveness, ability to record and display multiple views are some of the technical capabilities.

CENTRAL LAB

The Lab aims at becoming the go-to place for high-end characterisation and analysis for academia and industry within the country. Student apprenticeships, restructuring of the Central Lab committee, efforts to add new equipment and a brochure to disseminate information about the Lab, all speak to this.

PLACEMENTS

SBASSE has top academic placements (Massachusetts Institute of Technology, Harvard University, University of Warwick, London School of Economics, University of Oxford, University of Cambridge etc.). Its graduates are hired by top local and international organisations (Engro Corporation, Nestle Pakistan, Systems Ltd., Microsoft, Google, Facebook etc.)

LEARNING WITHOUT BORDERS

Research and teaching at LUMS truly offer its community 'Learning Without Borders' by breaking academic, geographic and socio-economic barriers to make education accessible to all. The University continues to be an intellectual hub, rich with varying perspectives and transformative ideas. With an environment brimming with inclusion, unity, and boundless knowledge, learning continues in and beyond the campus walls with the aim to develop innovators, leaders and change-makers who can contribute to the community and build strong borderless networks.

TOP QUALITY PUBLICATIONS

SBASSE faculty have produced around 300 articles, all published in international venues of prestigious ranking.

RECOGNITION OF TOP RESEARCH THROUGH SYED BABAR ALI RESEARCH AWARDS (SBARA)

These Awards recognise PhD students. The winners, called the Syed Babar Ali Fellows, are selected for the novelty of their research work, and the potential for lasting impact to their disciplines and the society.



MS | PhD CHEMISTRY

How will you launch your new world?

The Department of Chemistry and Chemical Engineering aspires to establish itself as an internationally recognised centre for graduate teaching and research in a wide variety of disciplines that include Nanoscience and Nanotechnology, Materials Chemistry, Catalysis, Drug Discovery/Medicinal Chemistry and Environment.

What will your new world invent?

The Department comprises a diverse group of research-active faculty members that work on interdisciplinary research projects interfacing Chemistry with other Science and Engineering disciplines. Faculty members and their research interests include:

BIOORGANIC AND MEDICINAL CHEMISTRY

Dr. Muhammad Saeed

CATALYSIS AND GREEN CHEMISTRY

Dr. Ghayoor Abbas

CATALYST DESIGN

Dr. Muhammad Zaheer

DRUG DISCOVERY

Dr. Rahman Shah Zaib Saleem

ENERGY MATERIALS

Dr. Ali Rauf

ENERGY SYSTEM SIMULATIONS

Dr. Muhammad Shoaib

FUNCTIONAL NANOMATERIALS

Dr. Irshad Hussain

HETEROGENEOUS CATALYSIS

Dr. Qandeel Almas

HETEROGENEOUS CATALYSIS

Dr. Muhammad Faheem

INDOOR AIR QUALITY MONITORING

Dr. Shahana Khurshid

MEMBRANE SCIENCE AND ENGINEERING

Dr. Faheem Hassan Akhter

MULTIFUNCTIONAL NANOCOMPOSITES

Dr. Salman Nosheer Arshad

POLYMERS AND NANOCOMPOSITES

Dr. Habib-Ur-Rehman

SOFT MATTER AND INTERFACES

Dr. Basit Yameen

SOLID STATE CHEMISTRY

Dr. Falak Sher

SUSTAINABLE ENVIRONMENTAL SOLUTIONS

Dr. Qasim Imtiaz

PROCESS SYSTEM ENGINEERING

Dr. Rofice Dickson

WATER TREATMENT

Dr. Tauqeer Abbas

How will Chemistry help you realise your ambition?

Students benefit from the excellent research facilities at the Department of Chemistry and Chemical Engineering and varied research programmes. The Chemistry teaching and research labs are well equipped with state-of-the-art experimental facilities and equipment. There is a fine collection of supplies and equipment including spectroscopic, structural and materials characterisation tools.

Students work closely with faculty who have published research articles in highly prestigious and high impact international journals. Faculty has also developed impactful international collaborations with prominent national and international research groups in the USA, UK, Germany, Switzerland, Turkey, China and Saudi Arabia.

Embrace the Chemistry experience

- Prof. Dr. Irshad Hussain and Dr. Muhammad Zaheer received the Charles Wallace Fellowship at the Cambridge University, UK. Dr. Rahman Shah Zaib Saleem received the German Academic Exchange Service (DAAD) Fellowship for Research Stays for University Academics and Scientists.
- Dr. Salman N. Arshad, Assistant Professor, Department of Chemistry and Chemical Engineering, has been working to re-imagine battery technology from the ground up. His research paper was published in the journal, *Synthetic Metals*.
- Dr. Muhammad Saeed and his co-workers identified small molecules as potential leads for antiviral drug development against COVID-19 and Dengue virus. The findings have been published in *Journal of Biomolecular Structure and Dynamics*, and *Pathogens*.
- PhD graduate, Dr. Soneela Asghar has accepted the position of postdoctoral research assistant at Drug Discovery Unit, School of Life Sciences, University of Dundee, UK.



DR. MUHAMMAD SABIEH ANWAR

Dean and Professor, Syed Babar Ali School of Science and Engineering

"The graduate programmes in science and engineering at SBASSE are poised to make an impact. Our deepest impact as an institution would truly be made by the research that emanates from our graduate education and the research that it propels. We are committed to providing a collegial, rigorous and progressive research milieu that triggers the thirst for knowing and seeking the truth, and in the process, creating tools, gadgets, machines and ideas that address the human condition and global issues. We promise that our graduate programmes will make you ride through the two extremes of the microcosm and the macrocosm, the ideal and the practical, the abstract and the tangible. Welcome to the Syed Babar Ali School of Science and Engineering!"



YOUR JOURNEY BEGINS HERE!

Admission Criteria for Local and International Students

Admission is purely merit-based and rests on the following criteria:

MS Programme

- Academic Record
- Performance in Admission Tests
- Application Review
- Submission of complete online application, application processing fee and supporting documents by the stipulated deadline
- Interview Performance (If needed)
- Letter of Recommendation

PhD Programme

- Academic Record
- Performance in Admission Tests
- Application Review
- Research Statement
- Submission of complete online application, application processing fee and supporting documents by the stipulated deadline
- Letters of Recommendation and
- Interview Performance (If shortlisted)

Note: This is the minimum criteria that applicants need to fulfil in order to be eligible to apply. Fulfilment of this criteria does not guarantee admission to LUMS.

For further details, please visit
<https://lums.edu.pk/graduate>

Admission Criteria for Phd Programme for Foreign Nationals

SBASSE's PhD application for foreign nationals caters to applicants who currently reside outside Pakistan and have a foreign nationality.

All other applicants (i.e. those who have dual nationality, are Pakistani nationals, or are overseas Pakistanis) are required to apply through the regular admission application.

Admission is purely merit-based and rests on the following criteria:

- Academic Background
- Research Background
- Online Test and Interview (If shortlisted)

In order to study at LUMS, foreign nationals must obtain a 'Study Visa' from the Pakistani Embassy/Consulate working in their country. The Pakistani Embassy/Consulate will only issue a Study Visa for students' stay at LUMS upon receipt of Higher Education Commission (HEC), Pakistan's 'No Objection Certificate' and clearance from the Ministry of Interior, Pakistan.

For the issuance of Visa, students must submit relevant documents to the LUMS Admissions Office through postal mail/courier service by the stipulated deadline.

For details, please visit
<https://international.lums.edu.pk>

FINANCIAL SUPPORT FOR LOCAL AND INTERNATIONAL STUDENTS

Admission to all LUMS programmes is purely on merit and independent of students' ability to pay the related tuition fees. Once a student has been admitted to a programme, there are several mechanisms in place to provide financial support based on need and merit. All awards are reassessed each academic year based on performance, need, available resources and prevailing University policies. LUMS is committed to providing as much financial assistance as possible within the limits of its available resources. Nevertheless, the University may not be able to meet all requests for financial assistance, and it is strongly recommended that applicants secure as much of their own funding as possible. Several funding opportunities are available to deserving MS and PhD students. These include:

- Merit Scholarships
- Partial tuition fee waivers for MS Basic Sciences students
- LUMS Interest-free Loan that covers partial to full tuition fee expense (only for local applicants)
- External Scholarships (support and eligibility for these scholarships vary depending on the donor)
- Options to work as Research or Teaching Assistants (subject to availability)
- Full funding of the PhD, which covers tuition, registration, admission fee and a monthly stipend for four (4) years.

For details, please visit
<https://financial-aid.lums.edu.pk/graduate-financial-aid>



DR. FALAK SHER

Associate Professor and Chair, Department of Chemistry and Chemical Engineering

"The goal of the MS and PhD Chemistry programmes is to educate innovators and future leaders in chemical sciences. The interdisciplinary approach enacted in the vision of SBASSE and the transdisciplinary spaces available across LUMS in conjunction with international collaborations, synergistically create a unique research environment. Our highly qualified and research-active faculty are engaged in research endeavours that cut across multiple disciplines and are focused on understanding as well as solving the complex challenges related to health, energy, environment, and industry."



IQRA AZEEM

PhD Chemistry

"I was fortunate to interact with brilliant professors at the Department of Chemistry and Chemical Engineering who are well-known experts in their field. I had ample resources to conduct high-quality research and a helpful mentor in Dr. Basit Yameen. I didn't just learn about writing high-impact research articles, but he also made me understand that a true scholar is a life-long learner who is always curious."

FOR FURTHER DETAILS, VISIT

MS PROGRAMME:

[HTTPS://LUMS.EDU.PK/PROGRAMMES/MS-CHEMISTRY](https://lums.edu.pk/programmes/ms-chemistry)

PHD PROGRAMME:

[HTTPS://LUMS.EDU.PK/PROGRAMMES/PHD-CHEMISTRY](https://lums.edu.pk/programmes/phd-chemistry)

PHD PROGRAMME (FOREIGN NATIONALS):

[HTTPS://LUMS.EDU.PK/PROGRAMMES/PHD-CHEMISTRY-FOREIGN-NATIONALS](https://lums.edu.pk/programmes/phd-chemistry-foreign-nationals)

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