

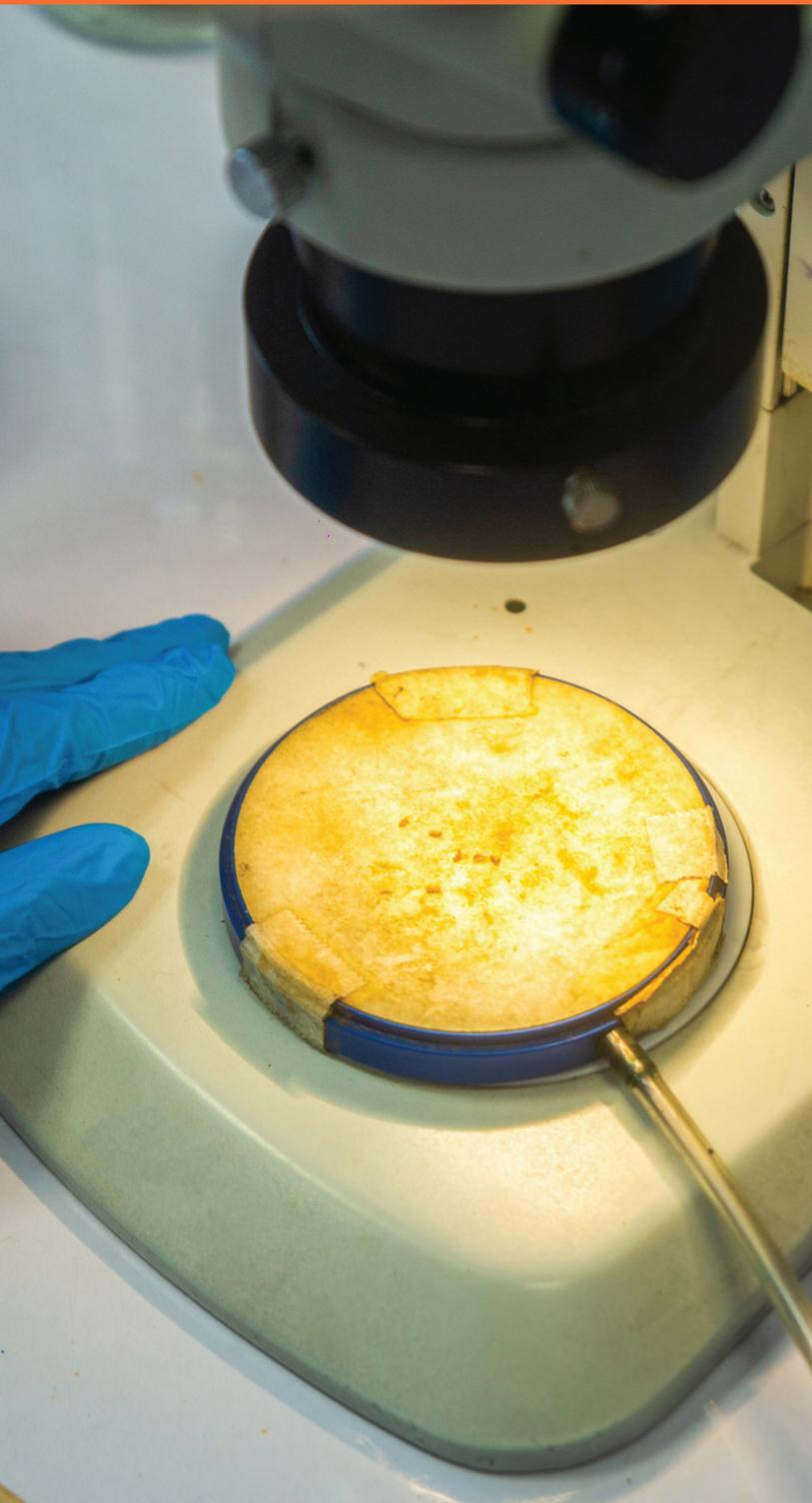


**IMAGINE
YOUR
FUTURE**

**PhD
CHEMICAL AND
ENVIRONMENTAL
ENGINEERING**

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.

WHY CHOOSE SBASSE

QS World University Rankings by Subject

#301-350 Computer Science and Information Systems

#351-400 Engineering – Electrical and Electronics

#401-450 Engineering and Technology

#501-550 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, University of Oxford, University of Cambridge). Its graduates are hired by top local and international organisations (Engro Corporation, Nestle Pakistan, Systems Ltd., Microsoft, Google, Facebook).

LEARNING WITHOUT BORDERS

Research and teaching at LUMS truly offers 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.

PhD CHEMICAL AND ENVIRONMENTAL ENGINEERING

How will you launch your new world?

The PhD in Chemical and Environmental Engineering will prepare you to address contemporary and emerging environmental issues, including sustainable energy resources, environmental monitoring, catalysis and reaction engineering, molecular engineering of materials, and process systems engineering. As an integral component of graduate education, the programme engages students in rigorous research alongside coursework and provides fully equipped clusters, groups, and labs.

What will your new world invent?

This programme will train students to translate molecular interactions into products and processes. The faculty are actively engaged in teaching and cutting-edge research in the fundamental sciences and applied engineering fields. Their research has been published in prestigious academic journals.

Themes	Labs/Clusters	Associated Faculty
Sustainable Energy Resources	Energy Materials	Dr. Ali Rauf
	Functional Nanomaterials	Dr. Irshad Hussain
	Solid State Chemistry	Dr. Falak Sher
	Functional polymers and interfaces	Dr. Basit Yameen
Environmental Science and Engineering	Air Quality Monitoring	Dr. Shahana Khurshid
	CO ₂ Capture	Dr. Qasim Imtiaz, Dr. Faheem Hassan Akhtar
	Water and Wastewater Treatment	Dr. Tauqeer Abbas, Dr. Faheem Hassan Akhtar, Dr. Ali Rauf
	Functional polymers and interfaces	Dr. Basit Yameen
Catalysis and Reaction Engineering	Catalyst Design and Biomass Valorisation	Dr. Muhammad Zaheer
	Heterogeneous Catalysis	Dr. Qandeel Almas
	Catalysis & Green Chemistry	Dr. Ghayoor Abbas
Molecular Engineering of Materials	Membrane Science and Engineering	Dr. Faheem Hassan Akhtar
	Medicinal Chemistry	Dr. Muhammad Saeed
	Drug Discovery	Dr. Rahman Shah Zaib Saleem
	Ionic Liquids and Molecular Simulation	Dr. Tauqeer Abbas
	Polymers and Nanocomposites	Dr. Basit Yameen, Dr. Habib-Ur-Rehman, Dr. Salman Nosheer Arshad
Process Systems Engineering	Process Systems	Dr. Rofice Dickson

How will Chemical and Environmental Engineering help you realise your ambition?

The PhD in Chemical and Environmental Engineering is the first of its kind in the region. It provides a conducive research environment supported by international collaborations and comprises highly skilled faculty. Students and faculty work closely and have developed impactful industrial and international collaborations with various groups in the USA, South Korea, China, and Saudi Arabia. Currently, the research programmes are being pursued in the following fields:

- Energy materials
- Air quality and monitoring
- Membrane technology
- Water and wastewater treatment
- Biomass valorisation
- Heterogeneous catalysis
- Process systems engineering

Embrace the Chemical and Environmental Engineering experience

The faculty at the Chemical and Environmental Engineering Programme provides an excellent opportunity for graduate research.

- Dr. Rofice Dickson and Dr. Ali Rauf, along with their students, have successfully engaged with the local industry to provide remarkable solutions.
- Dr. Faheem Hassan Akhtar was among the finalists of the prestigious Patrick Meares Award in the field of membrane science at Copenhagen, Denmark.
- Dr. Rofice published in *Green Chemistry* on the process development for solar-driven processes.
- Dr. Faheem Hassan Akhtar and his student solved the challenge of breathing new life into plastic waste by converting them into fine membranes for water treatment applications. Their article was published in *ACS Sustainable Chemistry & Engineering*.



DR. MUHAMMAD SABIEH ANWAR

Ahmad Dawood Chair, 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:

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
- 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.

Scan for more information



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.

Scan for more information



FINANCIAL SUPPORT FOR LOCAL AND INTERNATIONAL STUDENTS

LUMS provides full funding of the PhD, which covers tuition, registration, admission fee and a monthly stipend for 4 years.

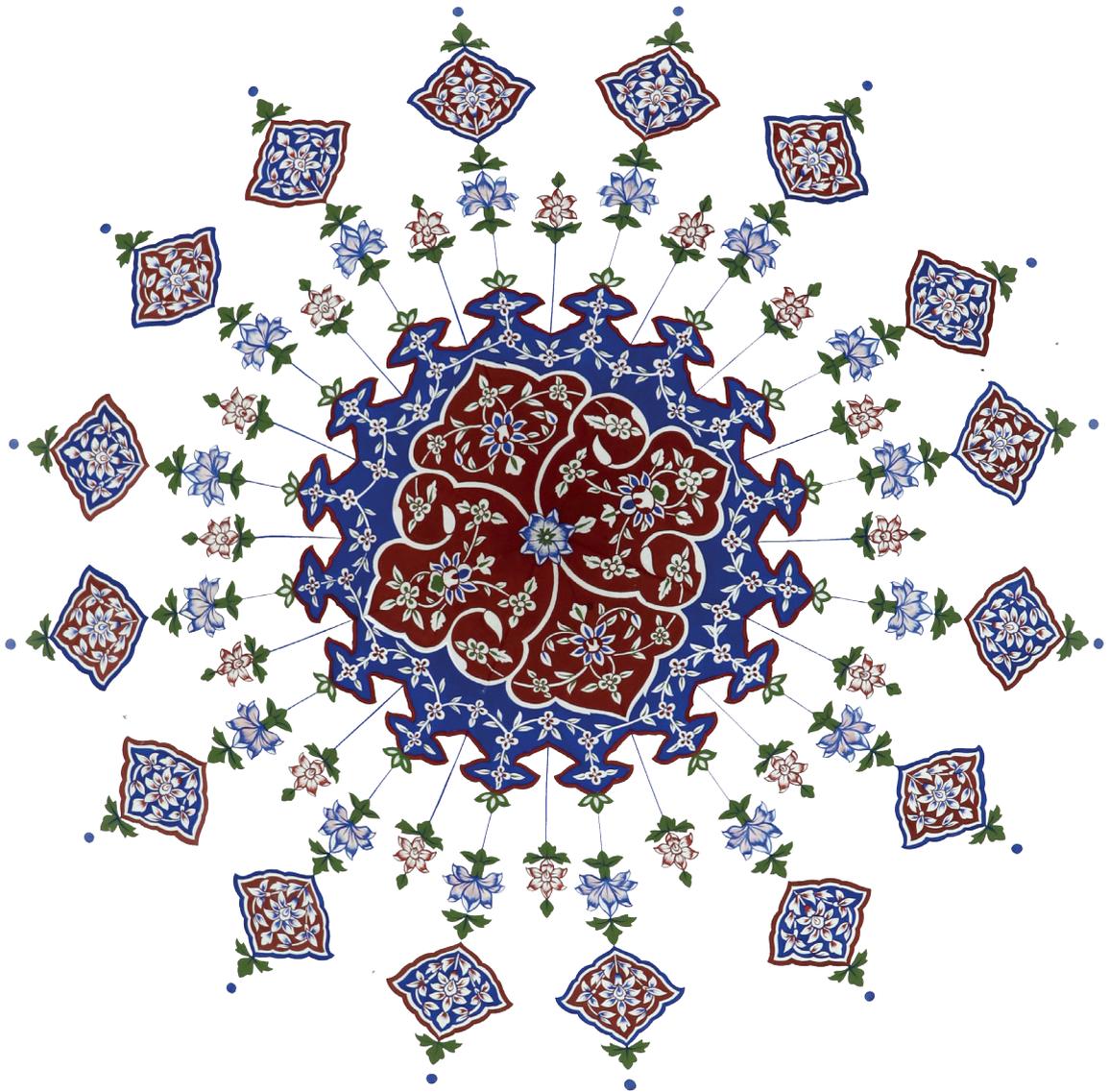
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DR. FAHEEM HASSAN AKHTAR

Programme Head and Assistant Professor, Department of Chemical Engineering

"The Chemical and Environmental Engineering programme aspires to take the lead in fostering an academic and research ecosystem that addresses societal and global challenges. The mission is to develop environmentally friendly products and systems to help resolve the grand challenges and key issues of human sustainability like water, environment, energy, and food."



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#LearningWithoutBorders