



CHEMISTRY
MS AND PhD PROGRAMMES
FALL 2020

RESEARCH
INNOVATE
IMPACT



CREATING A BETTER WORLD

WITH LUMS SBASSE

For over a decade, the Syed Babar Ali School of Science and Engineering (SBASSE) at LUMS has been imparting top-quality education with an aim to carry out world-class, multidisciplinary research.

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 collecting 24 credit hours from coursework and the rest from a thesis. Hence, 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. To graduate, students must earn a total of 42 credit hours from which 18 must be from coursework and 24 from research work/thesis. Major milestones that must be achieved for the successful completion of the PhD degree include the Comprehensive (Qualifying) Examination, Thesis Proposal Defense 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.

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DISCIPLINES:

BIOLOGY
CHEMISTRY
COMPUTER SCIENCE
ELECTRICAL ENGINEERING
MATHEMATICS
PHYSICS

SBASSE OFFERS
UNDERGRADUATE,
GRADUATE &
DOCTORAL
DEGREES

WHY CHOOSE SBASSE



MULTIDISCIPLINARY EDUCATION

The rigorous curriculum of the graduate programmes at SBASSE offers a multidisciplinary learning environment. It provides students with the opportunity to work with knowledge drawn from all six disciplines being offered at SBASSE as a part of the free elective requirement.



TOP-QUALITY PUBLICATIONS

The research conducted by graduate students has been published in top-quality, renowned journals including:

- Journal of Mathematical Analysis and Applications
- IEEE/ACM Transactions on Networking
- Artificial Intelligence Review
- Photonics and Nanostructures: Fundamentals and Applications
- Organic Letters
- The Journal of Biological Macromolecules
- Nature Publishing Group
- Royal Society of Chemistry
- Journal of Computational and Applied Mathematics



INTERNATIONAL AND NATIONAL EXCHANGE PROGRAMMES

MS and PhD students at SBASSE participate in various exchange programmes and research opportunities sponsored by National ICT R&D Fund, HEC, Commonwealth, Erasmus-Mundus, DAAD etc.



OUR PLACEMENTS

Top academic placements (Massachusetts Institute of Technology, University of Warwick, London School of Economics, University of Oxford, University of Cambridge etc.)

Our graduates are hired by top local and international organisations (Engro Corporation, Nestle Pakistan, Systems Ltd., Microsoft, Google, Facebook etc.)

64% of the graduates have been placed on jobs and 49% who opted for higher studies received scholarships from different universities across the globe.

MS and PhD students work alongside faculty members at SBASSE as Teaching Assistants and Research Assistants.

COLLABORATIONS WITH NATIONAL AND INTERNATIONAL INSTITUTES

- Institute of Electronics and Telecommunications of Rennes, France
- Singapore University of Technology and Design, Singapore
- CentraleSupélec, France
- Texas A&M University, Qatar
- NUST School of Electrical Engineering and Computer Science, Pakistan

MS | PhD CHEMISTRY

QUICK FACTS

64%
graduates placed
on jobs

80+
highly qualified
faculty members

HOW WILL YOU LAUNCH YOUR NEW WORLD?

The Department of Chemistry and Chemical Engineering offers MS and PhD programmes for those who wish to contribute effectively to the development of science by taking advantage of the Department's conducive and thriving research environment. It aspires to establish itself as an internationally recognised and globally competitive centre for graduate teaching and research in a wide variety of chemical disciplines that include Nanoscience and Nanotechnology, Materials Chemistry, Catalysis, Drug Discovery and Medicinal Chemistry.

WHAT WILL YOUR NEW WORLD INVENT?

The Department of Chemistry and Chemical Engineering comprises a diverse group of research active faculty members. In addition to the traditional areas of Chemical Sciences, they work on interdisciplinary research projects interfacing Chemistry with other Science and Engineering disciplines. Faculty members and their research interests are listed below:

CATALYSIS AND GREEN CHEMISTRY

Dr. Ghayoor Abbas

MULTIFUNCTIONAL NANOCOMPOSITES

Dr. Salman Noshear Arshad

FUNCTIONAL NANOMATERIALS

Dr. Irshad Hussain

POLYMERS AND NANOCOMPOSITES

Dr. Habib-ur-Rehman

SYNTHETIC, ORGANIC AND BIOORGANIC CHEMISTRY AND CHEMICAL BIOLOGY

Dr. Muhammad Saeed

DRUG DISCOVERY

Dr. Rahman S. Z. Saleem

SOLID STATE CHEMISTRY

Dr. Falak Sher

SOFT MATTER AND INTERFACES

Dr. Basit Yameen

CATALYST DESIGN

Dr. Muhammad Zaheer



DR. SHAHID MASUD

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

“Our multifaceted 21st century curriculum provides students adequate breadth and depth in their education, and positions them to pursue rapidly evolving areas that interface with other disciplines. The fact that our graduates are much sought after by leading academic institutions as well as organisations in the Engineering and IT sectors every year serves as a solid indicator of the high-quality of our programmes. With our resolute vision, excellent research-active faculty, outstanding students and modern infrastructure that includes state-of-the-art classrooms and laboratories, SBASSE is poised to become a globally competitive leader in Science and Engineering research and education.”

HOW WILL SBASSE HELP YOU REALISE YOUR AMBITION?

Students benefit from the excellent research facilities at the Department of Chemistry and Chemical Engineering and extensive research programmes in the following areas:

Nanoscience and Nanomedicine	Polymers and Nanocomposites
Cancer Therapeutics	Organometallic Chemistry
Drug Discovery and Delivery	Electronic Materials
Synthetic Organic Chemistry	Natural Product Chemistry
Green Chemistry and Catalysis	Biomass Conversion
Renewable Energy	Environmental Chemistry

The Chemistry faculty has developed impactful international collaborations with prominent national and international research groups in the USA, United Kingdom, Germany, Switzerland, Turkey, China and Saudi Arabia. These collaborations are instrumental in keeping the faculty abreast of the latest developments in the field and to use advanced technology platforms and high-tech equipment currently not available anywhere in Pakistan.

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 including *Nature*, *Nature Materials*, *Advanced Materials*, *Angewandte Chemie Int. Ed.*, *Journal of the American Chemical Society*, *Nano Letters*, *ACS Journal of Medicinal Chemistry* among several others.



DR. BASIT YAMEEN

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 that instills in our students a capability of performing original scientific work related to the emerging complex opportunities and challenges of the 21st century. Our highly qualified and research-active faculty is engaged in research endeavours that cut across multiple disciplines and are focused on understanding as well as solving the intricate challenges related to health, energy, environment, and industry.”

EMBRACE THE SBASSE EXPERIENCE

- Dr. Ihsan Ayyub Qazi, Associate Professor of Computer Science at SBASSE and Dr. Ayesha Ali, Assistant Professor of Economics at Mushtaq Ahmad Gurmani School of Humanities and Social Sciences, won the highly competitive Facebook Integrity Foundational Research Award worth USD 50,000 for their proposal, 'Understanding the Impact of Digital Literacy on Misinformation in Pakistan.'
- The International Commission for Optics and the Abdus Salam International Centre for Theoretical Physics declared Dr. Muhammad Faryad, Assistant Professor, Department of Physics, as winner of the 2019 Gallieno Denardo Award, for his contributions to Optics research and education.
- Dr. Shaper Mirza, Associate Professor of Biology won The Shahid Hussain Foundation's Public Health Research Grant 2018 worth PKR 1 million.
- Two PhD Chemistry students—Iqra Azeem and Asma Gilane were awarded the Commonwealth Split-site PhD scholarships to spend a year at UK universities.
- Junaid Saif Khan, MS Physics 2018 was selected for the 69th Lindau Nobel Laureate Meeting in Lindau, Germany.
- LUMS Energy Institute carried out the power demand and supply analysis for Pakistan for the years 2018-2030.
- Tariq Lab at LUMS has discovered over 200 new genes that are involved in the maintenance of cell identities. These results will have a direct implication in the field of cancer biology and regenerative medicine.
- The LUMS Biomechanics Lab, a centre to test bowling actions, has now been accredited by the International Cricket Council, making it the fifth in the world to earn this accolade.



IQRA AZEEM

PhD Student, Chemistry and Chemical Engineering

"I wished to work in a highly competitive environment with a passionate team and this became possible when I, from among participants of 53 countries of the Commonwealth Foundation, was provided with this opportunity to fulfil my ambition. This distinguished scholarship has paved the way for me to not only interact with world-class scientists but also enhanced my research skills by working in state-of-the-art labs at the University of Strathclyde in the UK."

YOUR JOURNEY BEGINS HERE!

ADMISSION PROCESS FOR LOCAL AND INTERNATIONAL STUDENTS

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

- Academic record
- Admission test performance
- Submission of completed application form and supporting documents by the stipulated deadline
- Interview performance (if called)

For details, visit:

<https://admission.lums.edu.pk/graduate-programmes>

TESTING DETAILS

Local Applicants

Applicants to the MS/PhD Programme in Chemistry are required to take the following

two (2) admission tests in order to be considered for Fall 2020 admission:

1. LUMS Graduate Admission Test (LGAT); and
2. LUMS SBASSE Subject Test in Chemistry

Exemption for applicants who have taken the Graduate Record Examination (GRE) Tests:

- Applicants who have taken the Graduate Record Examination (GRE) General Test (through the Educational Testing Service (ETS), USA) during last two (2) years (i.e. after April 01, 2018) and obtained an aggregate score of 300 in the Quantitative and Verbal sections may choose not to take the LGAT.
- Applicants who have taken the GRE Subject Test in Chemistry (through the

Educational Testing Service (ETS), USA) during last two years (i.e. after April 01, 2018) and obtained a score at the 60th percentile or above may choose not to take the SBASSE Subject Test in Chemistry.

International Applicants

Applicants residing outside Pakistan are required to take the following two (2) admission tests in order to be considered for Fall 2020 admission:

1. GRE - General Test; and
2. GRE - Subject Test in Chemistry

For GRE registration, please visit www.ets.org

NOTE

- LUMS Graduate Admission Test (LGAT) is comprised of Quantitative, Verbal, and Analytical sections.
- The LUMS Graduate Admission Test (LGAT) and the SBASSE Subject Test in Chemistry for Fall 2020 admission will be held ONLY ONCE on April 12, 2020.
- LGAT and SBASSE Subject Test Scores will be valid only for one (1) academic year.
- The LGAT and SBASSE Subject Test scores will be used for application evaluation, hence will not be disclosed to applicants.

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 for MS programmes
- Partial tuition fee waivers for all MS Basic Sciences and Mathematics students
- LUMS Interest Free Loan (only for local applicants)

- External Scholarships (support and eligibility for these scholarships vary depending on the donor)
- 100% Scholarships (tuition, registration, admission, and a stipend) for PhD students for 4 years
- HEC Research Grants
- Options to work as Research or Teaching Assistants (subject to availability)

For details, please visit: <https://financial-aid.lums.edu.pk/ms-programme-grad-fa>

INTERNATIONAL STUDENTS

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: international.lums.edu.pk

DATES TO REMEMBER

DEADLINE TO APPLY

APRIL 1, 2020
5:00 pm (PKT)

LGAT & SBASSE SUBJECT TEST

APRIL 12, 2020

DEADLINE TO APPLY FOR LUMS
UG CONTINUING STUDENTS

APRIL 1, 2020 5:00 pm (PKT)

DEADLINE TO TAKE GRE (GENERAL)

APRIL 12, 2020

ADMISSION DECISIONS

JUNE - JULY 2020

COMMENCEMENT OF CLASSES

SEPTEMBER 2020



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www.lums.edu.pk



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