

ELECTRICAL ENGINEERING

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

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

- IEEE Communications Letters
- IEEE Access
- IEEE Transactions on Smart Grid
- IEEE Transactions on Vehicular Technology
- IEEE Journal on Selected Topics in Signal Processing
- EURASIP Journal on Wireless Communications and Networking
- IEEE Journal of Photovoltaics
- IEEE Electron Device Letters
- IEEE Transactions on Audio, Speech and Language Processing
- IEEE Transactions on Signal Processing
- Applied and Computational Harmonic Analysis
- IEEE Signal Processing Letters
- Journal of Electronic Science and Technology
- Human Behaviour Understanding in Networked Sensing: Theory and Applications of Networks of Sensors
- Multimedia Tools and Applications



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

- Singapore University of Technology and Design, Singapore
- CentraleSupélec, France
- Australian National University, Australia
- University of Kaiserslautern, Germany
- Sony, Germany
- King Abdullah University of Science and Technology, Saudi Arabia
- University of Colorado Boulder, USA
- Koç University, Turkey
- University of Maryland, USA
- Umm Al-Qura University, Saudi Arabia
- Massachusetts Institute of Technology, USA

MS | PhD ELECTRICAL ENGINEERING

QUICK FACTS

64%
graduates placed
on jobs

80+
highly qualified
faculty members

HOW WILL YOU LAUNCH YOUR NEW WORLD?

The Electrical Engineering programme gives students both a strong foundation in contemporary areas of Electrical Engineering including Communication Systems, Computer Networks, Embedded Systems, Nanoelectronics, VLSI Design Signal Processing, Control Systems, Robotics, Renewable Energy Systems and Optoelectronics. Students are also strongly encouraged to collaborate with other disciplines at SBASSE.

WHAT WILL YOUR NEW WORLD INVENT?

The Electrical Engineering MS and PhD programmes are internationally reputable, providing a research environment that is equally supported by international collaborations, and are taught by faculty from leading universities around the world. Currently, research programmes are being pursued in the following fields:

WIRELESS COMMUNICATION

OPTICS AND ELECTROMAGNETICS

ELECTRONICS AND EMBEDDED SYSTEMS

SIGNAL, IMAGE AND VIDEO PROCESSING

ENERGY AND POWER SYSTEMS

SEMI-CONDUCTOR DEVICES AND NANO-ELECTRONICS

COMPUTER NETWORKS AND SYSTEMS

RF AND MICROWAVE

BIOMEDICAL IMAGING



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?

State-of-the-art Research Facilities

- **CENTRE FOR WATER INFORMATICS AND TECHNOLOGY (WIT)**
Director:
Dr. Muhammad Abubakr

 - **ADVANCED COMMUNICATIONS (ADCOM) LAB**
Directors:
Dr. Momin Ayub Uppal
Dr. Ijaz Haider Naqvi
Dr. Naveed Ul Hassan

 - **AI & ROBOTICS IN PRECISION AGRICULTURE AND FORESTRY**
Directors:
Dr. Ahmad Kamal Nasir
Dr. Mian Awais

 - **BIO-AGRI PHOTONICS (BAP) LAB**
Director:
Dr. Muhammad Imran Cheema

 - **THE CLINICAL AND TRANSLATIONAL IMAGING LAB**
Director:
Dr. Hassan Mohy-ud-Din

 - **CYPHYNETS**
Director:
Dr. Muhammad Abubakr
- **ELECTRONICS AND EMBEDDED SYSTEMS LAB**
Directors:
Dr. Muhammad Adeel Pasha
Dr. Muhammad Jahangir Ikram
Dr. Shahid Masud
Dr. Awais bin Altaf
Dr. Wala Salem Mustafa Sadeh

 - **ENERGY AND POWER SYSTEMS LAB**
Directors:
Dr. Hassan Abbas Khan
Dr. Nauman Ahmad Zaffar

 - **RAMCASP RESEARCH LAB**
Director:
Dr. Wasif Tanveer

 - **SEMICONDUCTOR AND NANO-ELECTRONIC DEVICES LAB**
Director:
Dr. Nauman Zafar Butt

 - **SMART DATA SYSTEMS AND APPLICATIONS LAB**
Directors:
Dr. Zubair Khalid
Dr. Muhammad Tahir
Dr. Momin Ayub Uppal



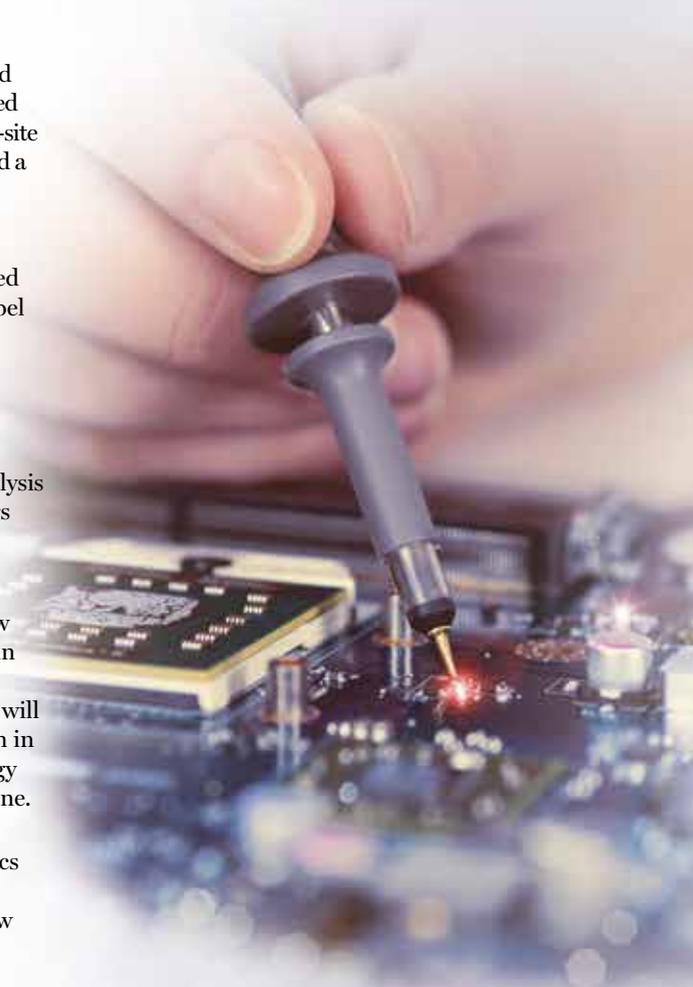
DR. MUHAMMAD ABUBAKR

Associate Professor and Chair, Department of Electrical Engineering

“The Department of Electrical Engineering is the largest and most complex operation at SBASSE comprising the biggest group of faculty, numerous labs and facilities, a large body of hard-working students and dedicated staff members. Electrical Engineering is the engine that drives the information and intelligence revolutions; it is the inspiration for synthetic biology and neuroscience; it is the instrument of scientific discovery in Physics and Chemistry; it is the user and generator of the deepest results in Mathematics. Our faculty and students build advanced communication systems, design hardware for intelligent systems, conceive renewable energy solutions, study biomedical devices and invent smart systems for manufacturing industry and agriculture.”

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.



DR. MASHOOD NASIR

PhD Electrical Engineering 2018, Postdoctoral Research Fellow, Aalborg University

"My PhD in Electrical Engineering at LUMS has been a great experience for me in terms of learning, exposure and transforming my career as a potential future leader in academia, research and development."

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 Electrical Engineering 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 Electrical Engineering

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

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

Test in Electrical Engineering, all local applicants must take the LUMS SBASSE Subject Test in Electrical Engineering.

International Applicants

Applicants residing outside Pakistan are required to take the **GRE General Test** through the Educational Testing Service (ETS), USA.

For further information, please visit www.ets.org

Due to the unavailability of a GRE Subject Test in Electrical Engineering, applicants will be assessed based on their GRE General Test score only.

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 Electrical Engineering 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



LUMS

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www.lums.edu.pk



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