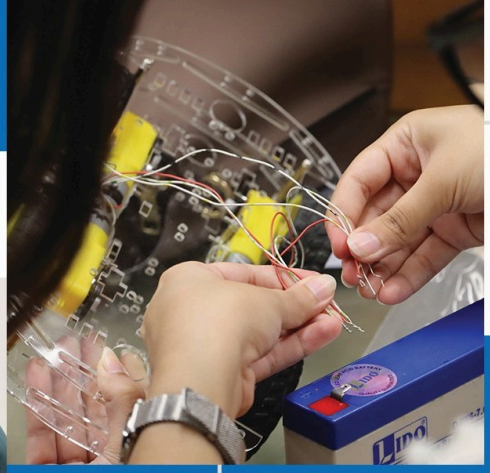
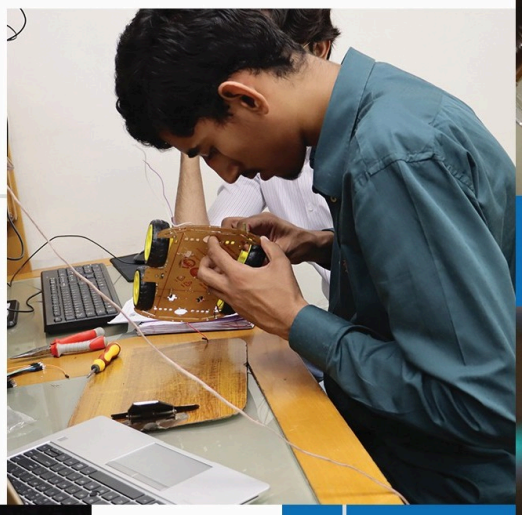
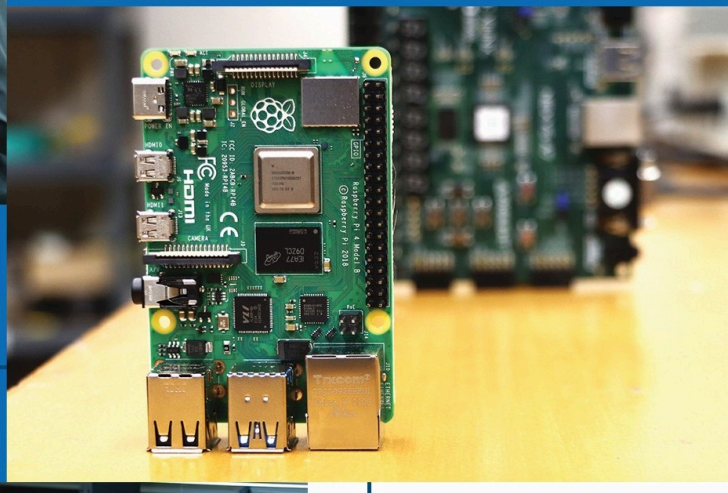
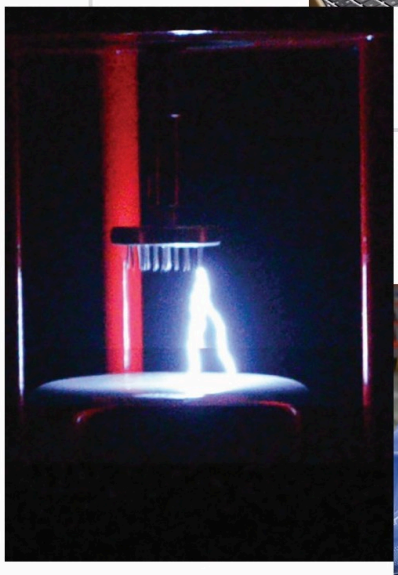
LUMS
A Not-for-Profit University





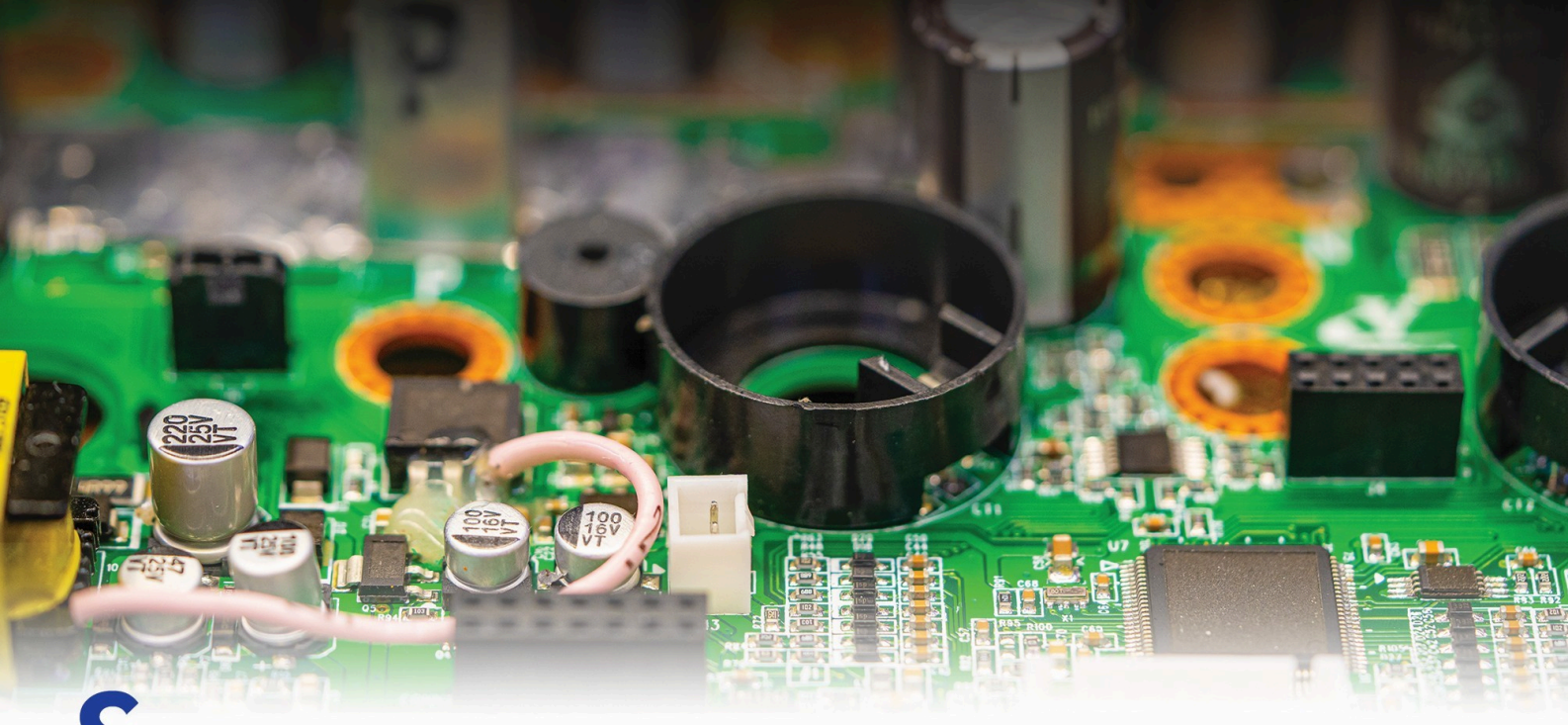




MS
DIGITAL AND EMBEDDED SYSTEMS

EMPOWERING EVERY JOURNEY

Syed Babar Ali School of Science and Engineering



SYED BABAR ALI SCHOOL OF SCIENCE AND ENGINEERING (SBASSE)

LUMS and SBASSE Fostering a Dynamic Learning Environment

Founded in 1985 as a non-profit, LUMS believes in making quality education accessible while breaking academic, geographic, and socio-economic barriers to enhance students' academic exposure.

SBASSE at LUMS is advancing innovative teaching and impactful research in science and technology. The MS programmes offer rigorous, professional, and research-focused training, with two pathways: MS-by-Coursework or MS-by-Thesis.

WHY MS DIGITAL AND EMBEDDED SYSTEMS AT LUMS?

QS WORLD UNIVERSITY RANKINGS BY SUBJECT

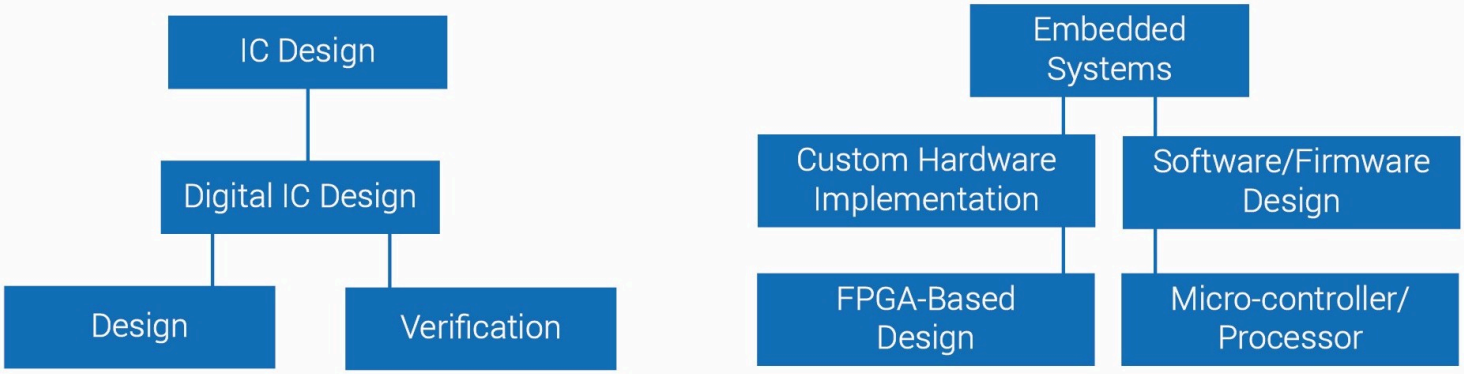
- #351–400
  Engineering - Electrical and Electronics
- #401–450
  Engineering and Technology

The MS Digital and Embedded Systems (MS DES) programme has been designed by incorporating local rising industry needs and is aimed at training students in designing digital integrated circuits (ICs) using industry-standard IC design tools and methodologies.

Additionally, it enables students to develop themselves to keep up with the ever-evolving field of embedded systems.

PROGRAMME CONCENTRATIONS

The programme has been built around two major concentrations that correspond to digital integrated circuits (ICs) design and embedded systems in general. The figure below shows the major thematic components that will be covered in this specialised programme:



PROGRAMME STRUCTURE

Students must fulfil 30 credit hours of MS degree requirements. The overall course structure and details are given below:

CORE COURSES

- Computer Architecture
- Digital System Design and Lab
- VLSI Design
- Embedded Systems

MAJOR ELECTIVES*

- VLSI Design for AI Applications
- Applied Cryptography
- Verification of Digital Systems
- VLSI for DSP Algorithms
- High Level Synthesis
- Mixed Signal Design

Other major elective courses recommended by the departmental Graduate Programme Committee (GPC)

*2-3 courses (6-9 credit hours) should be taken

APPLICATION ELECTIVES*

- Deep Learning
- Machine Learning
- Mobile Robotics
- Image and Video Coding
- Digital Image Processing
- Intelligent Systems
- Advanced Operating Systems
- Internet-of-Things

Other application elective courses recommended by the departmental GPC

*2-3 courses (6-9 credit hours) should be taken

PROJECT/THESIS/NON-THESIS

Any one of the following options may be selected:

- Two-semester long MS Thesis
- MS-by-Coursework
- One-semester long MS Project

THEMES AND COURSES

The Department of Electrical Engineering now includes 21 full-time PhD faculty leading teaching and research. Its programme offers core and elective courses in Digital IC Design and Embedded Systems, with opportunities for students to deepen their expertise through various research labs and clusters:

- DATA (AI HARDWARE AND THEORETICAL FOUNDATIONS)
- LIFE (BIOMEDICAL DEVICES AND POINT-OF-CARE HEALTHCARE)
- SUSTAINABILITY (SYSTEMS VIEW OF THE WATER-ENERGY-FOOD NEXUS)

"As the top-ranked student in my MS DES cohort at LUMS and a recipient of a 100% merit scholarship, I found the programme to be a rigorous and deeply practical pathway for transitioning from power systems to embedded systems. While working as a Control Systems Engineer at Powersoft19, I benefited from a curriculum that combined strong theoretical foundations with extensive hands-on work across FPGAs, SystemVerilog, Linux device drivers, Qt application development, computer architecture, and digital system design.

ZEERAK ALI
MS DES Student

ADMISSION CRITERIA AND FINANCIAL SUPPORT

ADMISSION IS PURELY MERIT-BASED.

Scan the code to explore eligibility, deadlines, how to apply to the MS Digital and Embedded Systems programme and find out how LUMS can support your academic journey.

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