

Bachelor of Engineering in Electrical Engineering (4 Years, 240 ECTS)

A comprehensive electrical engineering program spanning circuits, electronics, signals, power, communications, and control, with project-based labs and modern instrumentation.

Program Overview

- **Award:** B.Eng. in Electrical Engineering
- **Duration:** 8 Semesters (4 academic years)
- **Total Credits:** 240 ECTS
- **Delivery:** Lectures (L), Tutorials (T), Laboratories (P), Design Studio (S), Internship (I)
- **Workload:** 1 ECTS \approx 25–30 hours
- **Program Pillars:** Circuit Analysis • Electronics • Signals & Systems • Digital Systems • Power & Energy • Communications • Control Systems • Embedded Systems • Engineering Design • Safety & Ethics
- **Signature Experiences:** instrument-heavy labs, industry-aligned capstone, and an internship in semester 6.

Graduate Learning Outcomes

Graduates will be able to:

- 1 **Circuit Competence.** Analyze and design analog and digital circuits using standard methods and tools.
- 2 **Electronics Practice.** Build and test electronic systems with appropriate component selection and protection.
- 3 **Signals Insight.** Model signals and systems in time and frequency domains for analysis and design.
- 4 **Power Systems.** Understand power generation, conversion, and distribution with safety and efficiency focus.
- 5 **Communication Systems.** Design and evaluate basic communication links and protocols.

- 6 **Control & Embedded.** Implement control strategies on embedded platforms and validate performance.
- 7 **Professional Practice.** Work safely with electrical systems, document work, and collaborate effectively.
- 8 **Real-World Impact.** Apply EE to renewable energy, medical devices, automation, and connected infrastructure.

Curriculum Structure

Structured across 8 semesters (30 ECTS each). Most courses are 6 ECTS unless otherwise noted.

Year 1

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| Semester 1 (30 ECTS) | <ul style="list-style-type: none">• Calculus I - 6 ECTS• Engineering Physics I (Mechanics) - 6 ECTS• Programming for Engineers - 6 ECTS• Circuit Analysis I - 6 ECTS• Engineering Communication - 6 ECTS |
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| Semester 2 (30 ECTS) | <ul style="list-style-type: none">• Calculus II - 6 ECTS• Engineering Physics II (E&M;) - 6 ECTS• Linear Algebra for Engineers - 6 ECTS• Circuit Analysis II (AC) - 6 ECTS• Engineering Ethics & Safety - 6 ECTS |
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Year 2

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| Semester 3 (30 ECTS) | <ul style="list-style-type: none">• Electronics I (Diodes & Transistors) - 6 ECTS• Signals & Systems I - 6 ECTS• Digital Logic Design - 6 ECTS• Electrical Engineering Laboratory I - 6 ECTS• Technical Elective I - 6 ECTS |
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| Semester 4 (30 ECTS) | <ul style="list-style-type: none">• Electronics II (Amplifiers) - 6 ECTS• Signals & Systems II (Fourier/Laplace) - 6 ECTS• Electromagnetics (Intro) - 6 ECTS• Embedded Systems I - 6 ECTS• Technical Elective II - 6 ECTS |
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Year 3

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| Semester 5 (30 ECTS) | <ul style="list-style-type: none">• Power Electronics - 6 ECTS• Control Systems I - 6 ECTS• Communication Systems I - 6 ECTS• Electrical Engineering Laboratory II - 6 ECTS• Technical Elective III - 6 ECTS |
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- Semester 6 (30 ECTS)**
- Power Systems (Transmission & Distribution) - 6 ECTS
 - Digital Signal Processing - 6 ECTS
 - Communication Systems II (Wireless) - 6 ECTS
 - Technical Elective IV - 6 ECTS
 - Industry Internship - 6 ECTS
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Year 4

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| Semester 7 (30 ECTS) | <ul style="list-style-type: none">• Renewable Energy Integration - 6 ECTS• Embedded Systems II (RTOS & Peripherals) - 6 ECTS• Advanced Control (State Space) - 6 ECTS• Technical Elective V - 6 ECTS• Capstone Design I (Requirements & Prototype) - 6 ECTS |
| Semester 8 (30 ECTS) | <ul style="list-style-type: none">• Capstone Design II (Build & Validation) - 12 ECTS• Safety-Critical Engineering - 6 ECTS• Engineering Entrepreneurship - 6 ECTS• Advanced Seminar & Presentation - 6 ECTS |

Technical Elective Tracks

Choose at least 5 electives; focus on one track for specialization.

Track A — Power & Energy

- Smart Grids
- High-Voltage Engineering
- Motor Drives
- Energy Storage Systems

Track B — Communications & RF

- Antenna Design
- RF Circuits
- 5G/6G Concepts
- Information Theory

Track C — Embedded & Control

- Robotics Control
- Industrial Automation

- Embedded Linux
- Sensor Networks

Track D — Electronics & IC Design

- Analog IC Design
- Digital IC Design
- Mixed-Signal Systems
- Hardware Verification

Laboratories & Facilities

Electronics Teaching Labs

Oscilloscopes, spectrum analyzers, signal generators, and soldering/rework stations.

Power & Machines Lab

Motor benches, inverters, power analyzers, and protective equipment for power experiments.

RF & Communications Lab

RF measurement setups and software-defined radio platforms for wireless labs.

Embedded & Automation Studio

Microcontroller kits, PLC trainers, and sensor/actuator integration benches.

Capstone Design Examples

- **Solar Microgrid Controller**
Design a controller for solar + storage with safety interlocks and monitoring.
- **Wearable ECG Front-End**
Build an analog front-end and signal processing pipeline for clean ECG acquisition.
- **LoRa Environmental Monitoring Network**
Deploy low-power nodes and analyze link performance and data reliability.
- **Autonomous Motor Drive System**
Implement closed-loop control with fault detection on an embedded platform.