

# ELECTRICAL ENGINEERING

**B.Sc Electrical Engineering**

**B.Sc Electrical Engineering Technology**



## MISSION STATEMENT

To serve the engineering profession by offering high quality education to create professionals that contribute towards society by providing innovative solutions with a focus on research in Electrical Engineering and allied disciplines.

## MESSAGE FROM THE HEAD OF DEPARTMENT

Join the leading private sector university in the region and be a part of the exceptional educational experience offered by the Department of Electrical Engineering at CECOS. Our well-qualified faculty is dedicated to preparing young engineers and technologists for success, with a curriculum that emphasizes hands-on learning in state-of-the-art labs. We equip our students with essential skills like effective communication and problem-solving and offer opportunities for internships and industrial tours. Join us now and enjoy a rewarding journey toward your professional goals.

**Dr. Azhar Qazi**

Ph.D Electrical Engineering, CECOS University, Peshawar, Pakistan

# FACULTY OF ELECTRICAL ENGINEERING

**Dr. Azhar Qazi**  
Head of Department / Associate Professor  
Ph.D Electrical  
CECOS University, Peshawar

**Dr. Zaheer Farooq**  
Assistant Professor  
Ph.D Electrical Engineering  
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**Engr. Kiran Raheel**  
Assistant Professor  
M.Sc Communication Engineering  
UET, Peshawar  
Ph.D (In Progress)  
CECOS University

**Engr. Muhammad Uzair**  
Lab Engineer  
B.Sc Electrical Engineering  
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**Prof. Dr. Azzam ul Asar**  
Professor  
Post Doctorate Electrical Engineering  
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**Dr. Khalid Rehman**  
Assistant Professor  
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**Engr. Ali Mujtaba Durrani**  
Lecturer  
MS Power & Control  
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**Engr. Muhammad Adeel**  
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MS Electrical Engineering  
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**Col. Ashfaq Ahmad (R)**  
Associate Professor  
M.Sc Computer System Engineering  
NUST, Islamabad

**Engr. Osama Bin Muzaffar**  
Lecturer  
MS Electrical Engineering  
NUST, Islamabad

**Engr. Usman Khan Khalil**  
Lab Engineer  
MS Electrical Engineering  
Sarhad University, Peshawar

**Engr. Abdul Subhan**  
Lab Engineer  
B.Sc Electrical Engineering  
CECOS University, Peshawar

# ELECTRICAL ENGINEERING LABORATORIES



Circuit Lab  
Communication Lab  
Electrical Machines & Control Lab  
Electronics Lab  
Embedded Systems Lab  
Power System Lab  
Signal Processing Lab  
Computer Lab



# CURRICULUM OF ELECTRICAL ENGINEERING

## Semester-I

Course Code	Course Title	Credit Hours
ENG-101	English-I	3+0
SS-101	Islamic Studies	2+0
MATH-106	Calculus and Analytical Geometry	3+0
ME-101	Engineering Mechanics and Thermodynamics	3+0
CS-191	Introduction to ICT	3+0
NS-101	Applied Physics	3+0
Total Credit Hours		17

## Semester-II

Course Code	Course Title	Credit Hours
SS-205	Engineering Economics	2+0
MATH-108	Linear Algebra and Different Equations	3+0
EE-101	Linear circuit Analysis	3+1
EE-102	Engineering Drawing	0+1
CS-109	Computer Programming	2+1
SS-102	Pakistan Studies	2+0
ME-102	Workshop Practice	0+1
Total Credit Hours		16

## Semester-III

Course Code	Course Title	Credit Hours
MATH-201	Complex Variables and Transforms	3+0
EE-203	Electrical Network Analysis	3+1
EE-221	Digital Logic Design	3+1
Eng-102	English-II	3+0
EE-222	Electronic Devices and Circuits	3+1
Total Credit Hours		18

## Semester-IV

Course Code	Course Title	Credit Hours
MGT-331	Organizational Behavior	3+0
EE-231	Electrical Machines	3+1
MATH-202	Numerical Analysis	3+0
EE-223	Electronic Circuit Design	3+1
EE-232	Instrumentation and Measurement	3+1
Total Credit Hours		18

## Semester-V

Course Code	Course Title	Credit Hours
EE-333	Power Systems Analysis and Protection	3+1
MATH-211	Probability and Statistics	3+0
EE-304	Electromagnetic Field Theory	3+0
EE-305	Embedded Systems	3+1
EE-311	Signals and Systems	3+1
Total Credit Hours		18

## Semester-VI

Course Code	Course Title	Credit Hours
ENG-203	English-III	3+0
EE-312	Digital Signal Processing	3+1
EE-313	Communication Systems	3+1
EE-334	Power Electronics	3+1
EE-306	Linear Control Systems	3+1
Total Credit Hours		19

## Semester-VII

Course Code	Course Title	Credit Hours
EE-414	Computer Communication Networks	3+1
EE-415	Wave Propagation and Antennas	3+1
EE-435	Power Generation, Transmission and distribution	3+1
EE-498	Final Year Design Project-I	0+3
Total Credit Hours		15

## Semester-VIII

Course Code	Course Title	Credit Hours
MGT-431	Entrepreneurship	3+0
EE-416	Wireless and Mobile Communication	3+1
EE-417	RF and Microwave Engineering	3+1
EE-499	Final Year Design Project-II	0+3
Total Credit Hours		14

**Total Credit Hours = 135**

### Fact File

**Duration:** Four Years

**Eligibility:** a. Minimum 60% marks in Intermediate with Physics, Chemistry and Mathematics or DAE in Electrical Technology or relevant field. The applicants with minimum 60% marks in Intermediate with Physics, Mathematics and Computer Science are also eligible with Chemistry to be studied and passed as a remedial course in 1st semester after admission.

b. Minimum 33% marks in test conducted by ETEA or any other testing body approved by PEC.

## PROGRAM EDUCATIONAL OBJECTIVE (PEOs) OF ELECTRICAL ENGINEERING

- PEO 1: Graduate demonstrating a blend of engineering technology and professional skills in Civil Technology and allied disciplines.
- PEO 2: Graduate performing ethically and socially in a sustainable and responsible manner, as an individual and team member.
- PEO 3: Graduate striving to enhance learning and practicing skills.

## PROGRAM LEARNING OUTCOMES (PLOs) OF ELECTRICAL ENGINEERING

- PEO 1: Engineering Knowledge: An ability to apply knowledge of mathematics, science and engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
- PEO 2: Problem Analysis: An ability to identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
- PEO 3: Design/Development of Solutions: An ability to design solutions for complex engineering problems and design systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
- PEO 4: Investigation: An ability to investigate complex engineering problems in a methodical way including literature survey, design and conduct of experiments, analysis and interpretation of experimental data, and synthesis of information to derive valid conclusions.
- PEO 5: Modern Tool Usage: An ability to create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modeling, to complex engineering activities, with an understanding of the limitations.
- PEO 6: The Engineer and Society: An ability to apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solution to complex engineering problems.
- PEO 7: Environment and Sustainability: An ability to understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.
- PEO 8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
- PEO 9: Individual and Team Work: An ability to work effectively, as an individual or in a team, on multifaceted and/or multi disciplinary settings.
- PEO 10: Communication: An ability to communicate effectively, orally as well as in writing on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PEO 11: Project Management: Ability to demonstrate management skills and apply engineering principles to one's own work, as a member and/or leader in a team to manage projects in a multidisciplinary environment.
- PEO 12: Lifelong Learning: An ability to recognize importance of, and pursue lifelong learning in the broader context of innovation and technological developments.

# CURRICULUM OF ELECTRICAL ENGINEERING TECHNOLOGY

## Semester-I

Course Code	Course Title	Credit Hours
MATH-106	Calculus and Analytic Geometry	3+0
NS-100	Introduction to Physics	2+1
ET-101	Linear Circuits Analysis	2+1
SS-101	Islamic Studies	2+0
CS-190	Introduction to Computer Fundamentals	1+2
ET-102	Engineering Drawing	1+2
Total Credit Hours		17

## Semester-II

Course Code	Course Title	Credit Hours
MATH-108	Linear Algebra and Differential Equations	3+0
ET-120	Electronics	2+2
MT-101	Basic Mechanical Technology	2+1
ET-130	Power Generation Systems	2+0
ET-131	Electrical Machines-I	2+1
Total Credit Hours		15

## Semester-III

Course Code	Course Title	Credit Hours
SS-102	Pakistan Studies	2+0
ENG-103	Communication Skills	3+0
ET-222	Electrical Instruments and Measurements	2+2
ET-232	Electrical Machines-II	2+2
ET-221	Digital Electronics	2+2
Total Credit Hours		17

## Semester-IV

Course Code	Course Title	Credit Hours
ET-230	AC Circuit Analysis	2+2
ET-201	Electro-Magnetic Fields	2+0
ET-234	Electrical Power Transmission	2+1
ET-233	Electrical Power Distribution and Utilization	2+1
ET-223	Power Electronics	2+1
ENG-202	Technical Report Writing	3+0
Total Credit Hours		18

## Semester-V

Course Code	Course Title	Credit Hours
ET-301	Microprocessor Theory and Interfacing	2+1
ET-330	Switch Gear and Protective Devices	2+1
ET-310	Communications Technology	2+2
ET-302	Control Technology	2+1
MGT-335	Total Quality Management	2+0
ET-334	High Voltage Technology	2+1
Total Credit Hours		18

## Semester-VI

Course Code	Course Title	Credit Hours
ET-331	Power System Analysis	2+0
ET-311	Data and Computer Communication	2+2
ET-333	Industrial Drives and PLC	2+2
MGT-333	Project Management	3+0
ET-498	Project-I	0+3
Total Credit Hours		16

## Semester-VII

Course Code	Course Title	Credit Hours
ET-499	Project-II	0+3
ET-400	Supervised Industrial/Field Training	0+16
Total Credit Hours		19

## Semester-VIII

Course Code	Course Title	Credit Hours
ET-400	Supervised Industrial/Field Training	0+16
Total Credit Hours		16

Total Credit Hours = 136

### Fact File

**Duration:** Four Years

**Eligibility:** Minimum 50% marks in DAE Electrical or relevant field or Minimum 50% marks in F.Sc Pre-Engineering

## PROGRAM EDUCATIONAL OBJECTIVE (PEOs) OF ELECTRICAL ENGINEERING TECH

- PEO 1: Graduate demonstrating a blend of engineering technology and professional skills in Electrical Technology and allied disciplines.
- PEO 2: Graduate performing ethically and socially in responsible manner, as an individual and team member.
- PEO 3: Graduate striving to enhance learning and managerial skills.

## PROGRAM LEARNING OUTCOMES (PLOs) OF ELECTRICAL ENGINEERING TECH

- PLO 1: Technology Knowledge: An ability to apply knowledge of mathematics, natural science, technology fundamentals and technology specialization to defined and applied technology procedures, processes, systems or methodologies.
- PLO 2: Problem Analysis: An ability to Identify, formulate, research literature and analyze broadly-defined technology problems reaching substantiated conclusions using analytical tools appropriate to the discipline or area of specialization.
- PLO 3: Design/Development of Solutions: An ability to design solutions for broadly- defined technology problems and contribute to the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
- PLO 4: Investigation: An ability to conduct investigations of broadly-defined problems; locate, search and select relevant data from codes, data bases and literature, design and conduct experiments to provide valid conclusions.
- PLO 5: Modern Tool Usage: An ability to create, select and apply appropriate techniques, resources, and modern technology and IT tools, including prediction and modeling, to broadly-defined technology problems, with an understanding of the limitations.
- PLO 6: The Technologist and Society: An ability to demonstrate understanding of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to technology practice and solutions to broadly defined technology problems.
- PLO 7: Environment and Sustainability: An ability to understand and evaluate the sustainability and impact of technology work in the solution of broadly defined technology problems in societal and environmental contexts.
- PLO 8: Ethics: Understand and commit to professional ethics and responsibilities and norms of technology practice.
- PLO 9: Individual and Team Work: An ability to function effectively as an individual, and as a member or leader in diverse teams.
- PLO 10: Communication: An ability to communicate effectively on broadly defined technology activities with the technologist community and with society at large, by being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PLO 11: Project Management: An ability to demonstrate knowledge and understanding of technology management principles and apply these to one's own work, as a member or leader in a team and to manage projects in multidisciplinary environments.
- PLO 12: Lifelong Learning: An ability to recognize the need for, and have the ability to engage in independent and lifelong learning in specialist technologies.