DEPARTMENT OF ELECTRICAL ENGINEERING

Keeping in view the importance and realizing the impact of the different branches of Electrical Engineering on the socio-economic growth of our country, Sarhad University decided to launch Electrical Engineering Degree Program. The Degree program is so designed that it provides an opportunity to the enrolled students to select and opt for studying the courses either in Power Engineering Group, Telecommunication Engineering Group or Electronics Engineering Group, depending upon the aptitude of the students which they may develop during their initial courses of the study, and / or most importantly, based on the market demand for a particular group of Electrical Engineering. During the first two years (4 Semesters) of the four year Degree program (eight Semesters), courses are offered which cover the common fundamentals of all the major fields in Electrical Engineering. However, in the next two years, emphasis is laid on specialized option with a view to enhance career prospects. For the last two years, courses are carefully designed in terms of Power, Electronics and Communication Groups of Electrical Engineering enabling students for better understating of their areas of interest. The Bachelor Program in Electrical Engineering is accredited by the Pakistan Engineering Council.

MISSION

To produce graduates equipped with state-of-the-art education, in-depth knowledge and relevant skills to foster research and development activities, expose them to the complete cycle of research process and emphasize on the precept of how innovation blended with creativity can result in viable and meaningful research outcomes.

PROGRAM OFFERED:

Bachelor of Science in Electrical Engineering

FACULTY MEMBERS, DEPARTMENT OF ELECTRICAL ENGINEERING

Engr. Dr. Anees Ur Rehman	Chairman / Associate Professor	Ph.D Electrical Engg (Power), Sarhad University, Peshawar
Engr. Dr. Obaid ur Rehman	Professor	Ph.D Electrical Engineering, Zhejiang University, China
Engr. Prof. Abdul Mutalib Khan	Professor (on Leave)	M.Sc Electrical Power Engineering, Strathclyde University, Glasgow, UK
Engr. Dr. M. Abid Saeed	Asst. Professor / PG Coordinator	Ph.D Shanghai Jiao Tong University, Shanghai, China
Engr. Muhammad Iqbal Khan	Asst. Professor / Coordinator	MS Electrical Engineering, Sarhad University, Peshawar. Post Graduate Diploma, Telecommunication, Southwestern Sydney Institute Australia
Engr. Shahid Alam	Assistant Professor	MS Electrical Engineering (Communication), UET, Peshawar
Mr. Muhammad Tahir Atiq	Assistant Professor of Physics	M.Phil Solid State Physics, Punjab University, Lahore
Engr. Muhammad Fahim	Assistant Professor	MS Electrical Engineering Sarhad University, Peshawar, Post Graduate Diploma in Electrical Technology, Southwestern Institute Australia
Engr. Saleh Kakakhel	Assistant Professor	MS Electrical Engineering, Sarhad University, Peshawar
Engr. Mohsin Iqbal	Assistant Professor	MS Electrical Engineering, Sarhad University, Peshawar
Engr. Nouman Muslim	Lecturer	MS Electrical Engineering, Sarhad University, Peshawar
Engr. Iftikhar Khan	Lecturer	MSc. Electrical Engineering, CECOS, Peshawar
Engr. Syed Dildar Hussain Shah	Lecturer	MSc. Electrical Engineering, Sarhad University, Peshawar
Engr. Syed Noman	Lab Engineer	BSc Electrical Engineering

Bachelor of Science in Electrical Engineering

Program Code	071
Number of Courses	40
Credit Hours	134/137
Minimum Duration	8 Semesters, 4 Years
Maximum Duration	14 Semesters, 7 Years
Minimum CGPA Required To Earn Degree	2.00

Eligibility :

I. Candidates who have passed Intermediate (Pre-Engineering / Computer Science) from a recognized BISE in Pakistan with at least 60% unadjusted marks.

· *Students with F.Sc Computer Science are eligible but will have to study Chemistry as a remedial course in the 1st semester after admission.

II. Candidates possessing B-Tech (Hons) in the relevant field are also eligible for admission against the 2% reserved seats on open merit

III. Candidates possessing 3-years Post-Matric Diploma of Associate Engineer in the relevant technology with at least 60% unadjusted marks.

IV. All candidates are required to pass an entry test conducted by NTS / ETEA or any registered testing agency or University with at least 33% cumulative score.

Foreign Students need to pass entry/aptitude test conducted by the University. For further details, see clause 4 in Admission Process.

Program Educational Objectives (PEOs) :

The Department of Electrical Engineering at Sarhad University Peshawar has adopted the following three program educational objectives (PEOs). All of the PEOs have been devised keeping in view the vision and mission of the university and the professional requirements in the domain of Electrical Engineering.

PEO-1: The graduates will have the knowledge to analyze, investigate and solve complex engineering problems.

PEO-2: The graduates will be able to serve and lead for socio-economic and environmental development of the country.

PEO-3: The graduates will demonstrate lifelong learning attitude, entrepreneurial, and soft skills with ethical values.

Outcome Based Education (OBE) System :

OBE is an approach of curriculum design and teaching that focuses on what students should be able to do (attain) at the end of course/ program. The Undergraduate curriculum at Department of Electrical Engineering, Sarhad University was transformed into adopting OBE from Spring 2018 in accordance with requirements from Pakistan Engineering Council Accreditation Manual 2019 and to satisfy the requirements of Washington Accord 2013. The framework for OBE in the Electrical Engineering Department and the process control mechanism consists of four different phases i.e. design, assess, analyze and review. For each of the phases Program Educational Objectives (PEOs), Program Learning Outcomes (PLOs) and Course Learning Outcomes (CLOs), are defined.

1st SEMESTER

Course Code	Course Title	Cr. Hrs.16/19
MA 111	Calculus and Analytical Geometry	3-0
CS 111	Introduction to Computing	1-0
CS 111L	Introduction to Computing (Lab)	0-1
EE 111	Linear Circuit Analysis	3-0
EE 111L	Linear Circuit Analysis (Lab)	0-1
EE 107	Electricity and Magnetism	3-0
EE 107L	Electricity and Magnetism (Lab)	0-1
CE 102	Hydraulics	3-0
CH 103	*Chemistry (For the students of ICS background only)	2-1

2nd SEMESTER

Course Code	Course Title	Cr. Hrs.18
MA 121	Applied Linear Algebra	3-0
CS 121	Programming Fundamentals	2-0
CS 121L	Programming Fundamentals (Lab)	0-1
EE 121	Electronic Devices and Circuits	3-0
EE 121L	Electronic Devices and Circuits (Lab)	0-1
EE 122	Digital Logic Design	3-0
EE 122L	Digital Logic Design (Lab)	0-1
ENG 121	Functional English	2-0
GS 128	Pakistan Studies	2-0

3rd SEMESTER

Course Code	Course Title	Cr. Hrs.16
MA 211	Differential Equations	3-0
CS 221	Data Structures and Algorithms	2-0
CS 221L	Data Structures and Algorithms (Lab)	0-1
EE 211	Electrical Machines	3-0
EE 211L	Electrical Machines (Lab)	0-1
EE 212	Electrical Network Analysis	3-0
EE 212L	Electrical Network Analysis (Lab)	0-1
EE 224	Workshop Practice	1-0
EE 224L	Workshop Practice (Lab)	0-1

4th SEMESTER

Course Code	Course Title	Cr. Hrs.18
MA 221	Numerical Analysis	3-0
EE 213	Signals & Systems	3-0
EE 213L	Signals & Systems (Lab)	0-1
MA 240	Complex Variables and Transforms	3-0
ME 221	Engg. Drawing and Autocad	2-0
ME 221L	Engg. Drawing and Autocad (Lab)	0-1
ME 311	Applied Thermodynamics	3-0
ENG 311	Communication & Presentation Skills	2-0

5th SEMESTER

Course Code	Course Title	Cr. Hrs.18
EE 323	Electromagnetic Field Theory	3-0
EE 221	Communication Systems	3-0
EE 221L	Communication Systems (Lab)	0-1
MGT 270	Entrepreneurship	3-0
EE 436	Power Transmission & Distribution	3-0
EE436L	Power Transmission & Distribution (Lab)	0-1
EE 451	Embedded Systems	3-0
EE 451L	Embedded Systems (Lab)	0-1

6th SEMESTER

Course Code	Course Title	Cr. Hrs.18
EE 321	Linear Control Systems	3-0
EE 321L	Linear Control Systems (Lab)	0-1
EE 314	Probability Methods in Engineering	3-0
EE 222	Instrument & Measurements	3-0
EE 222L	Instrument & Measurements (Lab)	0-1
MGT 345	Organizational Behavior	3-0
	Elective I	3-1

7th SEMESTER

Course Code	Course Title	Cr. Hrs.16
MGT 411	Engineering Economics and Management	3-0
ENG 411	Technical Report Writing	2-0
	Elective-II	3-1
	Elective-III	3-1
RES 491	Project Part-I	0-3

8th SEMESTER

Course Code	Course Title	Cr. Hrs.14
GS 123/240	Islamic Studies/Values, Ethics & Society (For Non Muslims)	2-0
GS 421	Professional Ethics	2-0
	Elective-IV	3-1
	Elective-V	3-0
RES 492	Project Part-II	0-3

Electives

Communication Track

Course Code	Course Title	Cr. Hrs.
COM 308	Wave Propagation & Antenna	3-0
COM 308L	Wave Propagation & Antenna (Lab)	0-1
EE 439	Microwave Engineering	3-0
EE 439L	Microwave Engineering (Lab)	0-1
EE 338	Digital Communication	3-0
EE 338L	Digital Communication (Lab)	0-1
EE 429	Radar Systems & Television	3-0
EE 429L	Radar Systems & Television (Lab)	0-1
EE 441	Multimedia Communication	3-0
EE 441L	Multimedia Communication (Lab)	0-1
COM 385	Telecom Transmission and Switching	3-0
EE 426	Artificial Intelligence	3-0
COM 408	Optical Fiber Communication	3-0
COM 470	Satellite Communication Systems	3-0
COM 350	Mobile Communication	3-0
EE 425	Electromagnetic Compatibility	3-0

Power Track

Course Code	Course Title	Cr. Hrs.
EE 334	Industrial Electronics	3-0
EE 334L	Industrial Electronics (Lab)	0-1
EE 326	Electrical Machine Analysis and Design	3-0
EE 326L	Electrical Machine Analysis and Design (Lab)	0-1
EE 410	Power System Protection	3-0
EE 410L	Power System Protection (Lab)	0-1
EE 423	Advanced Electrical Machines	3-0
EE 423L	Advanced Electrical Machines (Lab)	0-1
EE 453	Electrical Power Transmission	3-0
EE 453L	Electrical Power Transmission (Lab)	0-1
EE 417	Power Electronics	3-0
EE 417L	Power Electronics (Lab)	0-1
EE 466	PLC and Industrial Drives	3-0
EE 466L	PLC and Industrial Drives (Lab)	0-1
EE 431	Power System Operation & Control	3-0
EE 310	Power Generation	3-0
EE 451	Power Economics & Management	3-0
EE 452	Renewable Energy Systems	3-0
EE 454	Fundamentals of High Voltage Engg.	3-0
EE 412	Digital Control Systems	3-0
EE 461	Integrated Electronic Circuit	3-0
EE 435	Power Generation & Utilization	3-0
EE 308	Power System Analysis	3-0
EE 308L	Power System Analysis (Lab)	0-1
EE 322	Introduction to Power Engineering	3-0

Electronics Track

Course Code	Course Title	Cr. Hrs.
EE 431	VLSI Design	3-0
EE 431L	VLSI Design (Lab)	0-1
EE 401	Digital System Design	3-0
EE 401L	Digital System Design (Lab)	0-1
EE 334	Industrial Electronics	3-0
EE 334L	Industrial Electronics (Lab)	0-1
EE 429	Radar Systems & Television	3-0
EE 429L	Radar Systems & Television (Lab)	0-1
EE 435	Digital Electronics	3-0
EE 435L	Digital Electronics (Lab)	0-1
EE 433	Industrial Process Control	3-0
EE 433L	Industrial Process Control (Lab)	0-1
EE 441	Digital Instrumentation	3-0
EE 442	Digital Instrumentation (Lab)	0-1
EE 439	Microwave Engineering	3-0
EE 439L	Microwave Engineering (Lab)	0-1
COM 326	Computer Communication Networks	3-0
COM 326L	Computer Communication Networks (Lab)	0-1
EE 480	Solid State Devices	3-0
EE 480L	Solid State Devices (Lab)	0-1
EE 322	Introduction to Power Engineering	3-0
EE 417	Power Electronics	3-0
EE 417L	Power Electronics (Lab)	0-1
COM 308	Wave Propagation & Antenna	3-0
COM 308L	Wave Propagation & Antenna (Lab)	0-1
EE 427	Digital Image Processing	3-0
EE 412	Digital Control Systems	3-0
EE 428	Computer Vision	3-0
EE 314	Opto Electronics	3-0
COM 470	Satellite Communication Systems	3-0
EE 425	Electromagnetic Compatibility	3-0
EE 327	Advanced Electronics	3-0
EE 347	Transmission Lines and Waveguides	3-0
EE 347L	Transmission Lines and Waveguides (Lab)	0-1
EE 339	Electronics Circuit Design	3-0
EE 339L	Electronics Circuit Design (Lab)	0-1

Program Learning Outcomes (PLOs):

PLO-01 **Engineering Knowledge:** An ability to apply knowledge of mathematics, science, engineering fundamentals and electrical engineering specialization to the solution of complex engineering problems.

PLO-02 **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.

PLO-03 **Design/Development of Solution:** 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.

PLO-04 **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.

PLO-05 **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.

PLO-06 **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.

PLO-07 **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.

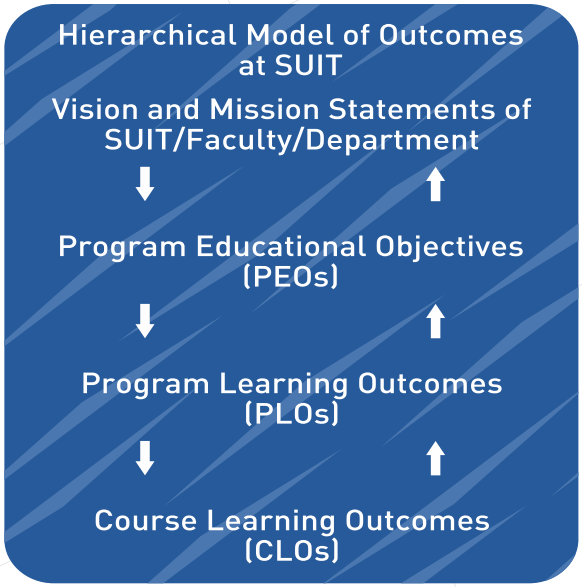
PLO-08 **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

PLO-09 **Individual and Team Work:** An ability to work effectively, as an individual or in a team, on multifaceted and /or multidisciplinary settings.

PLO-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.

PLO-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 multi disciplinary environment.

PLO-12 **Life-Long Learning:** An ability to recognize importance of, and pursue lifelong learning in the broader context of innovation and technological developments.



The facility for teaching of any of the elective course will be arranged only if reasonable number of students opt for.

NOTE: Students are required to study The Holy Quran as per the directive of the Government of Pakistan. See section 5 (a) e (i and ii).