

Faculty of Electrical Engineering

Department of Electrical Engineering

Introduction

The foundation of the Department of Electrical Engineering was laid down back in the year 2000 when the Computer Technology and Communication Programme was started under the umbrella of CASP at the postgraduate Diploma Level. The programme was upgraded to MSc Telecommunication in 2002. The programme gained significant recognition and graduates are making substantial contribution in the expansion of computing and telecom industry. Recognizing the strong role of engineering education in the national economy, the engineering discipline was strengthened in 2006, when a BSc Electronic and Telecommunication Engineering Programme were introduced in the same year. The university crossed another landmark in offering quality engineering education after the interim visit of Pakistan Engineering Council in 2008 in which PEC allowed GCU Lahore to continue its engineering programme. On the recommendation of Pakistan Engineering Council, establishment of Faculty of Engineering was approved by Syndicate in 2009 and the programme was shifted from CASP to its present premises. The Department of Engineering was notified in March 2010. The B.Sc. Engineering Programme was accredited by Pakistan Engineering Council in 2011 which is an acknowledgment of the efforts of the university in setting up good standards of engineering education. To reflect the academic activities of the Department effectively, the Syndicate in its 41st meeting held on 05/12/2013 approved the change of the name of Department of Engineering to Department of Electrical Engineering.

Programmes Offered

- BSc Electrical Engineering
- MS Electrical Engineering with Specializations in:
 1. Electronic Engineering
 2. Control Engineering
 3. Computer Engineering
 4. Telecommunication Engineering

BSc Electrical Engineering

The four years BSc Electrical Engineering programme was initiated in 2006 to meet the demand for qualified and skilled personnel in academia and industry, to meet the latest technological challenges and to stimulate the growth of Pakistan's economy, where there is acute shortage of competent and qualified manpower. In line with the tradition of GC University, this degree programme is benefiting from qualified and competent faculty and staff. The objectives of this degree programme are:

- To develop in-depth understanding of both theory and practice
- To develop the ability to reason with knowledge and to apply it to new problems as they arise in industry and research
- To make students aware of the social, technical and economic issues as they relate to electronics and telecommunications
- To provide exposure to cutting edge technologies as they develop.
- To cater for both national and international standards and codes of practice

MS Electrical Engineering (Evening)

Embedded systems, robots and computer numerical controlled machines are rapidly replacing conventional domestic and industry equipment and appliances. Even a modern automobile has built-in microcontrollers for optimum control and fault

diagnostics. The design and development of these applications requires sound knowledge in areas like Mechatronics and Control Engineering, Computer Engineering and Electronic Engineering. The implementation of LTE and other emerging advanced wireless and broadband technologies, which opened new horizons and has created the applications of telecommunications in areas like security and surveillance, medicine and education world over, is still awaited in Pakistan. The primary reason for this loss, apart from a strained law and order situation, is the comparatively high cost of the projects because of unavailability of telecom R&D sector in Pakistan. This deficiency can only be met with by producing professional telecommunication engineers of high caliber in the country. Realizing these facts, GC University Lahore initiated MS Electrical Engineering Programme with the following specializations:

- Electronic Engineering
- Control Engineering
- Computer Engineering
- Telecommunication Engineering

Research

Following three research groups have been established in the Department:

- System Level Integration
- Robotic and Intelligent Systems
- Signal Processing

Facilities

The Department holds the following sophisticated labs with state-of-the-art equipment:

1. Electronics Lab
2. Communication Systems Lab
3. Signal Processing Lab
4. Embedded Systems and Logic Design Lab
5. Power Electronics Lab
6. Control Systems Lab
7. Computer / Data Communication and Networks Lab
8. Electrical Machines Lab
9. Workshop and Drawing Hall
10. Project Lab

Departmental Library

The Department has a collection of over 2000 books explicitly related to Electronic Engineering, Control Engineering, Computer Engineering and Telecommunication Engineering.

Career Opportunities/Scope

Electrical Engineering is a profession that uses science, technology, and problem-solving skills to design, construct, and maintain products, services, and information systems. An electrical engineer may choose to couple the technical aspects of a position with management responsibilities. The requirement of technical expertise for today's managers has significantly increased because of the explosion of knowledge in all the engineering disciplines.

A Bachelor of Science degree in engineering with a specialty in electrical engineering may also serve as a starting point for careers in many other diverse fields, ranging from business to law, medicine, and politics, since the problem-solving skills acquired in an electrical engineering programme provide an extraordinarily valuable asset that serves as a solid foundation to progress in any field. In addition to the primary fields of

electrical, electronics and computer engineering, a Bachelors degree in electrical engineering serves as an appropriate base for several allied fields. These include, for example, biomedical engineering, computer science, and aerospace engineering.

Some of the potential employers in Pakistan include:

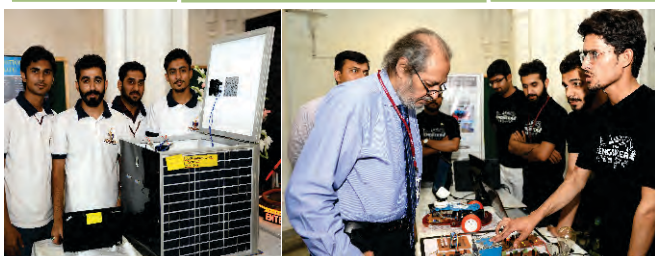
- **Power Sector:** NTDC, PEPCO, LESCO, DEPCO, Kohinoor Energy (pvt) Ltd and Orient Energy Systems etc.
- **Telecommunication Sector:** PTCL, Erricson, HUAWEI, Ufone, Telenor, Mobilink and Wateen etc.
- **Defence Sector:** NESCOM, Pakistan Aeronautical Complex (Kamra) and HMC Taxila etc.
- **Consumer Electronics:** PEL, Samsung, Sony, Dawlance, Mitsubishi and Haier etc.
- **Other Engineering Companies:** Packages Ltd, NESPAK and Pioneer Cement Industry etc

BSc (Electrical Engineering)		
Year-1		
Semester-1		
Course Code	Course Title	Credit Hours
EF-1102	Workshop Practice	1
HS-1102/HS-1103	Islamic Studies / Ethics	2
HS-1104	Functional English	3
IE- xxxx	Interdisciplinary Engineering Course- I	3
GS-1102	Calculus and Analytical Geometry	3
GS-1201	Applied Physics	3
GS-1201P	Applied Physics	1
Semester-II		
Course Code	Course Title	Credit Hours
CS-1202	Introduction to Computing	1
CS-1202P	Introduction to Computing (P)	1
EF-1101	Linear Circuit Analysis	3
EF-1101P	Linear Circuit Analysis (P)	1
EF-1201	Engineering Drawing	1
HS-1101	Communication Skills	3
HS-1202	Pakistan Studies	2
SS- xxxx	Social Sciences-I /	3
FL- xxxx	Foreign Language	
GS-1202	Linear Algebra	3
Year-2		
Semester-III		
Course Code	Course Title	Credit Hours
CS-2102	Programming Fundamentals	2
CS-2102P	Programming Fundamentals	1
EF-2202	Digital Logic Design	3
EF-2202P	Digital Logic Design (P)	1
EF-2203	Electrical Network Analysis	3
EF-2203P	Electrical Network Analysis (P)	1
GS-2101	Differential Equations	3
SS- xxxx	Social Sciences - II	3

Semester IV		
Course Code	Course Title	Credit Hours
EF-2102	Electronic Devices and Circuits	3
EF-2102P	Electronic Devices and Circuits (P)	1
EF-2204	Probability Methods in Engineering	3
CS-2201	Data Structures and Algorithms	
CS-2201P	Data Structures and Algorithms (P)	1
MS-2201	Professional Practice	3
IE- xxxx	Interdisciplinary Engineering Course- II	3

Year 3		
Semester V		
Course Code	Course Title	Credit Hours
EF-2201	Electrical Machines	3
EF-2201P	Electrical Machines (P)	1
EF-3102	Microprocessor Systems	3
EF-3102P	Microprocessor Systems (P)	1
EE-3101	Signals & Systems	3
EE-3101P	Signals & Systems (P)	1
GS- xxxx	General Science Elective - I	3
MS-3101	Engineering Economics and Management	3

Semester VI		
Course Code	Course Title	Credit Hours
EE-2201	Electromagnetic Field Theory	3
EE-3204	Communication Systems	3
EE-3204P	Communication Systems (P)	1
EE - xxxx	Breadth Core - I	3+ 1
EE - xxxx	Depth Elective - I	3
GS - xxxx	General Science Elective - II	3



Year-4		
Semester-VII		
Course Code	Course Title	Credit Hours
HS-4101	Technical Writing	3
EE-4101	Linear Control Systems	3
EE-4101P	Linear Control Systems (P)	1
EE - xxxx	Breadth Core - II	3+1
EE - xxxx	Depth Elective - II	3+1
EE-4299	Senior Design Project-I	3

Semester-VIII		
Course Code	Course Title	Credit Hours
EE-xxxx	Depth Elective-III	3+1
EE-xxxx	Depth Elective-IV	3+1
EE-xxxx	Depth Elective-V	3+1
EE-4299	Senior Design Project-II	3

Elective Courses		
Interdisciplinary Engineering Courses		
Course Code	Course Title	Credit Hours
IE-1101	Basic Mechanical Engineering	3
IE-3201	Applied Thermodynamics	3
IE-3202	Theory of Machines	3

- 1. Power Systems Engineering
- 2. Communication /Telecommunication Engineering
- 3. Electronic Engineering

Semester-VII		
Course Code	Course Title	Credit Hours
EF-2101	Instrumentation and Measurements	3+1
EF-3101	Probability & Statistics for Engineers	3+1
EE-3102	Power Electronics	3+1
EE-3103	Digital Electronics	3+1
EE-3201	Microprocessor Based Systems	3+1
EE-3202	Introduction to Power Engineering	3+1
EE-3203	Data Communication & Computer Networks	3+1
EE-4102	Optical Fiber Communication	3+1
EE-4103	Digital Signal Processing	3+1
EE-4104	Wave Propagation and Antennas	3+1
EE-4201	Microwave Communication	3+1

- 1. Power Systems Engineering
- 2. Communication /Telecommunication Engineering
- 3. Electronic Engineering

Semester-VIII		
Course Code	Course Title	Credit Hours
EE-4202	Mobile Communication	3+1
EE-4203	Satellite Communication	3+1
EE-4204	Telecommunication Management	3+1
EE-4205	Multimedia Communication	3+1
EE-4206	Advanced Electrical Machine Design	3+1
EE-4207	Advanced Electrical Machines	3+1
EE-4208	Analog and Digital Communication Systems	3+1
EE-4209	Antenna Theory and Design	3+1
EE-4210	Computer Communication Networks (Breadth Core - II)	3+1
EE-4211	Digital Communication	3+1
EE-4212	Digital Control Systems	3+1
EE-4213	Digital Image Processing	3+1
EE-4214	Electrical Power Transmission	3+1
EE-4215	Electronic Circuit Design (Breadth Core - I)	3+1
EE-4216	FPGA Based Systems	3+1
EE-4217	High Voltage Engineering	3+1
EE-4218	Industrial Electronics	3+1
EE-4219	Information Theory and Coding	3+1
EE-4220	Integrated Electronic Circuits	3+1
EE-4221	Introduction to Nano Technology	3+1
EE-4222	Mobile and Pervasive Computing	3+1
EE-4223	Mobile and Wireless Communication	3+1
EE-4224	Navigation and Radar Systems	3+1
EE-4225	Optical Communication	3+1
EE-4226	Opto-Electronics	3+1
EE-4227	PLC and Industrial Drives	3+1
EE-4228	Power Distribution and Utilization	3+1
EE-4229	Power Generation	3+1
EE-4230	Power System Analysis	3+1
EE-4231	Power system Protection	3+1
EE-4232	Power System Stability & Control	3+1
EE-4233	Renewable Energy Systems	3+1
EE-4234	RF and Microwave Engineering	3+1
EE-4235	Satellite Engineering	3+1
EE-4236	Solid State Devices	3+1
EE-4237	Transmission and Switching Systems	3+1
EE-4238	VLSI Design	3+1
EE-4239	Wireless and Mobile Communication	3+1



General Science Elective Courses		
Course Code	Course Title	Credit Hours
GS-1101	Applied Calculus	3
GS-2201	Complex Variable and Transforms	3
GS-3101	Numerical Analysis	3
GS-3102	Multivariable Calculus	3
GS-3103	Discrete Mathematics	3
GS-3104	Chemistry	3
GS-3105	Biology	3
Social Science Courses		
Course Code	Course Title	Credit Hours
HS-1201	Engineering Ethics	3
SS-1101	Sociology and Development	3
SS-1102	Social Anthropology	3
SS-1103	Psychology and Human Behavior	3
SS-1104	Professional Psychology	3
SS-1105	Organizational Behavior	3
SS-1106	Introduction to Sociology	3
SS-1107	Critical Thinking	3
SS-1108	Introduction to Philosophy	3
Management Courses		
Course Code	Course Title	Credit Hours
MS-1201	Engineering Economics	3
MS-1202	Entrepreneurship	3
MS-1203	Principles of Management	3
MS-2101	Engineering Management	3
Foreign Languages		
Course Code	Course Title	Credit Hours
FL-1101	German	3
FL-1102	French	3
FL-1103	Arabic	3
FL-1104	Persian	3
FL-1105	Turkish	3
FL-1106	Mandarin	3
Computer Science Courses		
Course Code	Course Title	Credit Hours
CS-1201	Computer Fundamentals	3
CS-2101	Object Oriented Programming	3



MS (Electrical Engineering)		
Year- I		
Semester-I		
Course Code	Course Title	Credit Hours
EE-7101	Advanced Techniques of Engineering Analysis	3
EE-7102	Advanced Digital Communication	3
EE-7103	Chaos Theory	3
EE-7104	Control of DC Machines Drive	3
EE-7105	Image and Video Processing	3
Semester-II		
Course Code	Course Title	Credit Hours
EE-7201	Advanced Computer Networks	3
EE-7202	Advanced Operating Systems	3
EE-7203	Digital Control Systems	3
EE-7204	FPGA based System Design	3
EE-7205	Mobile and Wireless Communication	3
EE-7206	Optimization Techniques	3
EE-7207	Stochastic Processes	3
EE-7208	Machine Learning	3
EE-7209	Telecom Systems and Networks	3
Year-2		
Semester-III & IV		
Course Code	Course Title	Credit Hours
EE-7499	Thesis	12

Faculty		
Department of Electrical Engineering		
In charge & Assistant Professor		
Engr. Dr. Junaid Zafar		
Assistant Professor		
Engr. Khurram M. Butt		
Engr. S.M. Haider Aejez		
M. Latif Anjum		
Engr. Nauman Shabbir		
Lecturer		
Engr. Asthma Mushtaq		
Engr. Bilal Ahmad		
Engr. Ateeq-ur-Rehman		
Engr. Afshan Batool		
Engr. Sumbel Ijaz		
Engr. Amna Ehsan		
Engr. Muhammad Naveed Iqbal		
Visiting/Adjunct Faculty		
Dr. Noor H. Sheikh		
Syed Rizwan Hassan		
Ayesha Karamat		
Shan ur Rahman		

