

**Name of Program: Electrical and Electronic
Engineering
(BACHELOR OF SCIENCE)**

Degree: Bachelor of Science

The Electrical and Electronic (EE) Engineering Program aims to enable students to respond positively and effectively to the role that the EE Engineer fulfills in the design, installation and maintenance of electrical and electronic systems. The program consists of courses from both electrical and electronic engineering disciplines. By selecting the appropriate courses from the list of major electives, students can specialize in a particular area such as electric power generation and distribution with emphasis on renewable energy, electrical installations, communication systems design and maintenance, electric circuits and electronic systems and control systems.

GENERAL OBJECTIVES:

- Development of student's capacity to think, write and speak effectively and creatively
- Development and appreciation of and respect for social, moral, and ethical values as the foundation of one's relationship to others and one's responsibilities to the community
- Development of student's analytical, decision-making and communication competencies together with those qualities of self reliance, responsibility, integrity and self-awareness which will promote personal achievement and contribution to organizations
- Building breadth of perspective through the general education requirements and provide sufficient specialization to meet basic professional and career requirements
- Provision of the necessary requirements for academic and/or career advancement

SPECIFIC OBJECTIVES:

- Preparation of students for a lifetime career in Electrical and Electronic Engineering by establishing a foundation for life-long learning and development
- Provision of a strong foundation in Engineering in general and Electrical and Electronic Engineering in particular
- Preparation of students for careers in the industry, government and various institutions
- Ability to target and troubleshoot engineering problems and to identify the requirements necessary for the solution
- Ability to design and conduct experiments for problem solving and to interpret obtained experimental data
- Ability to evaluate alternate approaches, procedures and tradeoffs in conjunction with engineering problems
- Ability to design, implement and evaluate a system or process to meet specific requirements
- Ability to conduct leadership and to work in teams with effective communication. Understanding of the various roles in a team and the contribution to accomplish a task
- Provision of communication knowledge and skills both written and oral to document work in reports and present results
- Understanding of the global need to engage in continuous technological development

LEARNING OUTCOMES:

Upon successful completion of this program, the students should be able to:

- Recognise essential facts, concepts, principles and theories relating to Electrical and Electronic Engineering
- Address a significant problem in Electrical and Electronic Engineering and deploy an appropriate selection of tools and techniques, as well as a disciplined approach, in

arriving at a solution of the problem. This is achieved through the project work of the course

- Deploy oral and writing skills in a variety of contexts - both inside and outside of Electrical and Electronic Engineering courses
- Appreciate the importance of practicing as professionals and having the breadth and depth of knowledge expected of a practicing engineer
- Recognise the important relationship between theory and practice through their exposure to the laboratory part of the course
- Appreciate the relevant professional, ethical and legal issues related to the work of an Electrical and Electronic Engineer
- Appreciate the importance of team activity and the strengths that can be derived from this

EMPLOYMENT OPPORTUNITIES:

Electrical Engineer, Electronic Engineer, Systems Engineer, Power Engineer, Control Engineer, Hardware Support, Hardware Service Engineer, Network Engineer, Telecommunication Engineer, Higher Education.

DEGREE REQUIREMENTS	CREDITS	ECTS
All students pursuing the Bachelor of Science degree in "Electrical and Electronic Engineering" must complete the following requirements:		
General Education Requirements	15	25
Science Requirements	8	15
Mathematics Requirements	20	37
Major Requirements	74	148
Free Electives	9	15
Total Requirements	126	240

GENERAL EDUCATION REQUIREMENTS		15 credits	25 ECTS
COM 101	Public Speaking	3	5
CSC 135	Writing for Computer Science and Engineering	3	4
ENG 103	Instruction in Expository Writing	3	6
PSY 103	Introduction to Psychology	3	6
General Education Elective		3	4
SCIENCE REQUIREMENTS		8 credits	15 ECTS
PHY 101	Introductory Physics I	3	5
PHY 102	Introductory Physics II	3	4
PHY 161	Introductory Physics I Laboratory	1	3

PHY 162	Introductory Physics II Laboratory	1	3
MATHEMATICS REQUIREMENTS		20 credits	37 ECTS
MAT 101	Calculus I	4	7
MAT 102	Calculus II	4	7
MAT 202	Differential Equations	3	6
MAT 203	Multivariable Calculus	3	6
MAT 206	Linear Algebra	3	5
MAT 217	Probability & Statistics	3	6
MAJOR REQUIREMENTS		74 credits	148 ECTS
CSC 131	Programming Principles I	3	6
ECE 100	Introduction to Engineering Principles and Measurements	3	6
ECE 101	Electric Circuits I	3	5
ECE 141	Electric Circuits I Laboratory	1	3
ECE 202	Electric Circuits II	3	5
ECE 211	Electronics I	3	5
ECE 212	Electronics II	3	5
ECE 213	Digital Logic	3	5
ECE 215	Computer Organization & Architecture	3	6
ECE 242	Electric Circuits II Laboratory	1	3
ECE 271	Electronics I Laboratory	1	3
ECE 272	Electronics II Laboratory	1	3
ECE 273	Digital Logic Design Laboratory	1	3
ECE 322	Data Communications and Computer Networks	3	6
ECE 330	Introduction to Communication Systems	3	5
ECE 338	Microprocessors and Macrocomputers	3	5
ECE 350	Signals and Systems Theory	3	6
ECE 351	Electric and Magnetic Fields	3	6
ECE 370	Power Engineering	3	6
ECE 389	Microprocessors and Microcomputers Laboratory	1	3

ECE 440	Control Systems and Theory	3	6
ECE 441	Control Systems Laboratory	1	3
ECE 473	Power Electronics	3	6
ECE 482	Data Communications and Computer Networks Laboratory	1	3
ECE 491	Senior Design Project	3	10
Major Electives*		15	25
<p>Major Electives <i>Students must select any five (5) of the courses available from the list of major electives, some of which must be from the specialization areas "Electrical Engineering" and "Electronic Engineering" according to the requirements of the local professional certification body.</i></p>			
BUS 360	Innovation and Entrepreneurship	3	5
CSC 330	Fundamentals of Distributed Systems	3	6
CSC 305	Assembly Language	3	5
ECE 418	Internship Project	3	5
ECE 450	Contemporary Topics	3	6
Specialization area: Electronic Engineering			
ECE 361	Network Fundamentals	3	6
ECE 362	Routing Protocols and Concepts	3	6
ECE 415	Embedded Systems	3	6
ECE 431	Digital Signal Processing	3	5
ECE 432	Parallel Computing	3	5
ECE 452	Microwave and Optical Transmission	3	6
ECE 462	VLSI Design	3	5
ECE 463	FPGA Design Using VHDL	3	5
Specialization area: Electrical Engineering			
ECE 420	Renewable Energy Sources	3	5
ECE 422	Photovoltaic Technologies	3	5
ECE 423	Electrical Integration of Renewable Technologies	3	5
ECE 471	Power Systems: Analysis	3	6
ECE 492	Electrical Energy: Generation, Transport and Distribution	3	6
ECE 474	Wiring Regulations: Explained and Illustrated	3	5

ECE 475	Wiring Regulations: Design and verification of electrical installations	3	5
Free Electives		9	15