

## ***Electrical Engineering***

### Institutional mission statement:

Provide quality higher technological education, developing well-rounded proficient professionals, with high sense of social responsibility, solid education in science, technology and innovation, who contribute to the sustainable development of the country.

### Student Outcomes:

- (a) An ability to apply knowledge of mathematics, science, and engineering.
- (b) An ability to design and conduct experiments, as well as to analyze and interpret data.
- (c) An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- (d) An ability to function on multidisciplinary teams.
- (e) An ability to identify, formulate, and solve engineering problems.
- (f) An understanding of professional and ethical responsibility.
- (g) An ability to communicate effectively.
- (h) The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
- (i) A recognition of the need for, and an ability to engage in life-long learning.
- (j) A knowledge of contemporary issues.
- (k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

### Program Educational Objectives (PEO's):

- **PEO1.** The professionals incorporate new engineering, information and communication technologies for improving industrial processes, equipment and electrical installations, contributing to the productivity of the industries.
- **PEO2.** The professionals update their selves in all their dimensions, they become aware of their own identity to develop their potentialities by means of research and technological development projects in order to contribute to the regional and national progress.

- **PEO3.** The professionals participate in the management of human and material resources for conducting electrical projects by considering the political, economic, social and cultural context. In addition, they are always committed to the sustainable development of their community in a responsible, legal, and ethical way.
- **PEO4.** The professionals apply their leadership skills with an entrepreneurial vision for professional activities in the organizations where they work or in their own company, by contributing to the personal, social and working environment.

Program Student Outcomes (PSO's):

**PSO-1.** An ability to apply math and science, for solving electrical, automation, and control engineering problems.

**PSO-2.** An ability to design electrical systems, in accordance to the standards such that operating conditions are safe, efficient, economic and sustainable.

**PSO-3.** An ability to function in interdisciplinary and multidisciplinary teams for developing projects.

**PSO-4.** An ability to communicate in an oral and written form, through technical and research projects reports, supported by graphics and/or audiovisual media.

**PSO-5.** An ability to use modern technology for developing electrical engineering projects.

COURSES OF THE STUDY PLAN

Year 1 – Semester 1	
Differential Calculus	Chemistry
Probability and Statistics	Integral Human Development
Research Fundamentals	Ethics Seminar
Complementary activities	
Year 1 – Semester 2	
Integral Calculus	Classical Mechanics
Electromagnetism	Technology of Materials
Computer Aided Drawing	Human Communication
Year 2 – Semester 1	
Vector Calculus	Linear Algebra
Electrical Circuits I	Electrical Measurements
Fluid Mechanics and Thermodynamics	Programming
Year 2 – Semester 2	
Differential Equations	Electromagnetic Theory
Electrical Circuits II	Analog Electronics
Modern Physics	Numerical Methods

<b>Year 3 – Semester 1</b>	
Control I	Mechanical Equipment
Electrical Transformers	Electrical Installations
Digital Electronics	Sustainable Development
<b>Year 3 – Semester 2</b>	
Control II	Fluid Power
Induction and Special Motors	Synchronous and Direct Current Machines
Industrial Electrical Installations	Research Seminar I
Social Service	
<b>Year 4 – Semester 1</b>	
Electrical Machines Control	Industrial Electronics
Electric Centrals	Electrical Power Systems Modeling
Fundamentals and Technology Applied to Robotics	Research Seminar II
Illumination Systems	
<b>Year 4 – Semester 2</b>	
Instrumentation	Electrical Energy Quality
Programmable Logic Controllers	Electrical Maintenance Tests
Legislation on Electrical Topics	Business Management, and Leadership
<b>Year 5 – Semester 1</b>	
Costs and Budgets of Electrical Projects	Selected Topics on Control Engineering
Advanced Course on Programmable Logic Controllers	Professional residency (Internship)

STATISTICS OF THE PROGRAM:

<b>Year</b>	<b>Freshman enrollment</b>	<b>Program Enrollment</b>	<b>Awarded</b>
2010	75	242	30
2011	62	244	17
2012	79	243	34
2013	64	249	38
2014	63	243	31
2015	39	230	27