

<b>Semester:</b>	3				
<b>Course Code:</b>	EE2800				
<b>Course Name:</b>	Introduction to Electrical Engineering				
<b>Credit Value:</b>	3 (Notional hours: 150)				
<b>Pre-requisites:</b>	None				
<b>Core/Optional</b>	Core				
<b>Hourly Breakdown</b>	<b>Lecture</b>	<b>Tutorial</b>	<b>Practical</b>	<b>Assignment</b>	<b>Independent Learning &amp; Assessment</b>
	30	7	9	7	97

**Course Aim:** To provide knowledge on electrical machines so that the students will be able to understand and analyse different electrical machines under steady state conditions.

**Intended Learning Outcomes:**

On successful completion of the course, the students should be able to;

- **calculate** voltage, current and power of single phase and balance three phase ac systems.
- **compute** power factor correction capacitors required for different applications.
- **describe** the construction and operating principles of single-phase transformers.
- **describe** the principle of operation of ac motors
- **evaluate** the performance of ac motors.
- **design** an electrical installation and appreciate the safety measures according to IEE regulations.

**Course Content:**

➤ **AC Circuits**

Phasors, j-notation, the concept of impedance, analysis of ac circuits.

➤ **Power in ac circuits**

Active, reactive and apparent power, analysis of balanced three phase systems, measurement of power in single-phase and three-phase systems, power factor improvement, energy, tariff.

➤ **Transformers**

Construction, principle of operation, equivalent circuit, efficiency and voltage regulation.

➤ **DC motors**

Torque and emf, commutator action, construction, equivalent circuit, efficiency, speed regulation, speed control and starting methods.

➤ **AC motors**

AC machine fundamentals; induced emf and torque on wire loop, rotating magnetic field. Three-phase induction motors; construction, principle of operation, equivalent circuit, power flow diagram, characteristic curves.

Single-phase induction motors; construction, principle of operation, types, characteristic curves, starting methods.

➤ **Building wiring systems**

Components of an electrical installation, earthing systems, earthing at an electrical installation, basic and fault protection, protection devices, loads and diversity factor, cable selection, standards inspection and testing.

**Teaching /Learning Methods:**

Lectures, Tutorials, Practical Work, and Assignments

**Assessment Strategy:**

Continuous Assessment	Final Assessment		
30 %	70%		
Details:	Theory (%)	Practical (%)	Other (%)
Assignments 10%	70		
Practical work 20%			

**Recommended Reading:**

- Edward Hughes, Mr Ian McKenzie Smith, Dr John Hiley, Dr Keith Brown, “Hughes Electrical & Electronic Technology”, Prentice Hall; 8th edition
- V.K Mehta and Rohit Mehta, “Principles of Electrical Engineering And Electronics”, S Chand, 2000
- Stephen J. Chapman, “Electric Machinery Fundamentals”, 3rd Edition, McGraw-Hill International Editions, 1999
- Theodore Wildi, “Electrical Machines, Drives and Power Systems”, 6th Edition, Pearson, 2005
- Robert L. Boylestad, Louis Nashelsky, “Electronic Devices and Circuit theory”, 11th Edition, Pearson, 2013.