MEC 1103 Electrical Engineering for Mechanical Engineers

Hours per semester				Weighted total mark	Weighted exam mark	Weighted continuous assessment mark	Credit unit
LH	PH	TH	CH				CU
45	30	75	60	100	60	40	4

Brief Description of Course:

This course introduces students to the fundamentals of electrical engineering. It covers the description and analysis of DC circuits and the related laws, single phase AC theory and circuit analysis, elements of transient signals and 3PH theory.

Course Objectives:

The objectives of this course are

- To introduce students to the basic techniques of circuit analysis
- To discuss the basic circuit laws and analyze DC circuits
- To equip students with knowledge about steady state, transient signals, single and three phase quantities.

Expected Outcomes:

- At the end of this course, the student should be able to:
- Define circuit laws and solve DC circuits
- Explain magnetic phenomena and the relevant laws
- Carry out AC circuit analysis
- Distinguish between steady state and transient signals
- Distinguish between single and three phase quantities
- Solve for the different quantities in 3PH circuitry

Course Content:

1. **DC circuits.**

- Ohm's and Kirchhoffs laws
- Superposition principle
- Analysis of DC circuits

2. **Principles of magnetism**

- Concepts and definition of magnetic terms
- Magnetic induction
- Magnetic circuit analysis
- B-H Characteristics

3. **Elements of Single Phase AC theory**

- Complex quantities
- AC circuit analysis of simple networks.
- Resonance

4. **Transient effects**

- L-R-C circuits
- Time constants

5. **Three phase supply**

- Nature and characteristics
- Connections
- Power measurements

6. **Electronics Practical sessions**

(4 Hours)

(6 Hours)

(8 Hours)

(6 Hours)

(7 Hours)

(14 Hours) (45 Hours)

Delivery Methods:

The course will be taught by using lectures, tutorials, assignments and practical electrical Engineering laboratory sessions.

Assessment Methods:

Course work (assignments and tests) and final examination and their relative contributions to final grade are shown as follows:

Requirement	**Percentage contribution**
Course work	40%
Final examination	60%
Total	100%

References:

KCA Smith&R.E Alley, Electrical circuits,Cambridge 1992.

Mohamed E. El-Hawary, "Electrical Power Systems: Design and Analysis, IEEE Press Series on Power Engineering), 1995

Allan Greenwood, "Electrical Transients in Power Systems", 1991 **TEC**