

MEHRAN UNIVERSITY OF ENGINEERING & TECHNOLOGY, JAMSHORO
DEPARTMENT OF INDUSTRIAL ENGINEERING AND MANAGEMENT

Title of Subject	:	Electrical Technology (EL102)	04 (03+01)
Discipline	:	Industrial Engineering and Management	
Semester	:	(1 st Semester 1 st Year)	
Effective	:	20-Batch and onwards	
Assessment	:	20% Sessional, 20% Mid Semester, 60% Final Semester Examination.	
Credit Hours	:	Th = 03 &Pr =01	
Marks	:	Th: 100 &Pr: 50	
Minimum Contact Hours	:	Th: 45 &Pr: 45	

Course Learning Outcomes: On completion of this course the students should be able to

CLO	Description	Taxonomy- Cognitive (minimum Level)	Mapping with PLOs
1	Define the basic concepts of electrical quantities and laws.	C1	1
2	Express comprehensive knowledge or electrical circuit , magnetic circuit	C2	1
3	Explain the construction and working of the electrical machines	C1	1
4	Give brief introduction of energy store and management	C1	1
5	Demonstrate the experiments and analyses the behavior of resistance, capacitance , batteries and electrical machines	P3	4

Course Contents:

- **Fundamentals of Electrical Technology:**
Current, Voltage, Potential difference, power, types of loads, Resistance, Capacitor, Inductor, and Ohm's Law.
- **Electrical Circuits:**
Single Phase Circuit, Three Phase Circuits, interconnections of three phase star and delta circuits, power factors improvement, faults detection and removal.
- **Direct and Alternating Current:**
Generation of alternating E.M.F in a rotating coil. Relationship between frequency, speed and number of pole pairs. Instantaneous, peak, average and R.M.S. values of A.C currents and voltages.
- **Transformer,** Transformer theory and E.M.F. equation, losses. Equivalent circuits. Some special types of transformers.
- **D. C. Machines:**
Generators: Fundamentals of D.C. generators; types and characteristics, e.m.f. equation, voltage regulation. Motors: speed and torque equation; types and characteristics. Starting and speed control of motors, braking and reversing.
- **A.C Machines:**
E.M.F. of elementary alternators, rotating magnetic field. Types and characteristics of induction motors, Single phase induction motor, poly-phase induction motors. Slip losses and efficiency of induction motor.
- **Batteries:**
Introduction to Batteries, primary and secondary batteries, batteries types, and construction of batteries.
- **Energy Management:**
Energy conversion, power consumption types, energy audit, loads forecasting.

- **Practical/Laboratory Work:**

Delta-star-delta transformation, Parallel operation of D.C generators and it characteristics. Measurement of primary/ secondary voltages of number of turns, use of ammeter, voltmeter for measuring current and voltage of motor, generator, etc. measurement of torque of motor. Characteristics of induction motors, measurement of power and power factor study of oscilloscope; other measuring instruments.

Practicals: will be based on theory:

Text Book:

Recommended Books:

- E. Hughes, Longman, “Electrical Technology”, Latest edition.
- Stephen J. Chapman, “Electrical Machinery Fundamentals”, Latest Edition.
- B.L Theraja, “Electrical Technology”, Latest Edition.

Approval:	Board of Studies:	Res. No. 40.1	Dated: 27.08.2019
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	Academic Council:	Res. No.	Dated: