MEHRAN UNIVERSITY OF ENGINEERING AND TECHNOLOGY JAMSHORO
Department of Civil Engineering

LESSON PLAN

COURSE TITLE: **Electro-mechanical Technology**	COURSE CODE: **CET304**	CREDIT HOURS: **02**	MINIMUM CONTACT HOURS: **32**
COURSE INSTRUCTER**: Prof. Dr. Khalifa Qasim Laghari**			
Batch: **22BSCT**	Semester: **5th**	Semester Starting Date: **09-12-2024**	Semester Suspension Date: **18-04-2024**

COURSE LEARNING OUTCOMES: Upon successful completion of the course, the student will be able to:

CLO No.	Description	Taxonomy level	Associated PLO
1	**Understand** construction and working principles of capacitors, batteries, diodes, and transistors	C2	1
2	**Apply** various energy conversion systems used in thermodynamics equipment.	C3	2

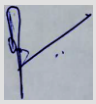
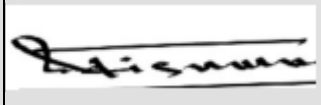
LESSON CONTENTS AND ASSOCIATED CLO(s)

Contents	CLO No.	Marks Assigned	Delivery Methods	Assessment Methods (Marks)
• **Electrostatics** Concept of Electric field. Equipotential surfaces. Permittivity. Electric stress, stored energy, motion of a charged particle in a uniform electrostatics field, calculation of capacitance. • **Electromagnetism** Concept of magnetic field Permissibility, magnetic properties of ferromagnetic materials. The magnetic circuit. Generation of EMF, Faraday's of laws of electromagnetic induction. • **Electric Circuit:** Resistivity, Ohm's Law, Kerchief's laws, Simple D.C network problems, Temperature coefficient. • **Alternating currents:** Mean and RMS values, The effects of resistance, inductance and capacitance in an AA, Circuit, vertical representation power and power factor. • **Secondary Batteries:** Types construction, charging and discharging rate, efficiency, care and maintenance. Transformers: The magnetic circuit of transformers, Transformation ratio, voltage,	**1**	**32**	• Class Lecture • Discussion	Class test (04) Quiz (03) Mid semester Exam (15) Final Exam (10)

current and power relationships. Electronics: Diode, transistors, and simple rectifier circuits. **No. of lectures required: 22**				
• **Thermodynamics Introduction** Introduction, gases and vapors, contents volume and pressure, PV diagram specific heat of gases and vapors. Laws of Boyle, Charles, Avogadro, Dalton. The two laws of thermodynamics. Heating of gases, adiabatic expansion, expansion curves, cycles of operation, • **Thermodynamics Cycles** A.S.E of cycle, reversibility, Carnot cycle sterling and Erickson Cycle, Joule, Otto and diesel cycle, • **Thermodynamic Processes and Energy Transformations** Heat transformation into work, TS diagram, Heating of gas at constant volume and pressure. General case of change of entropy • **Applications:** Air compressor, Single stage compressor, volumetric efficiency formation of steam, Enthalpy of water and steam, Use of steam tables, Volume of super-heated steam, Introduction to IC engines, Classification and working cycle injection and ignition of fuel. Governing of IC engine volumetric efficiency and performance. **No. of lectures required: 10**	**2**	**18**	•Class Lecture • Discussion	Assignment (08) Final semester (10)

ASSESSMENT DETAILS

S. No.	Assessment Activities	Marks	Activities		CLO(s) to be assessed
1	Class Test/Quiz/Assignment	**15**	Class Test/Quiz	**1+1**	**1**
			Assignment	**1**	**2**
2	Mid Semester Exam	**15**	**1**		**1**
3	Final Semester Exam	**20**	**1**		**1,2**

Prepared by: **Prof. Dr. Khalifa Qasim Laghari**	Reviewed by: **Curriculum Review Committee**	Approved by: **Chairman, CED**
Signature: 	Signature: 	Signature: 
Dated: 26-12-2024	Dated: 20-12-2024	Dated: 20-12-2024