MME210: MODERN ELECTRICAL AND ELECTRONICS TECHNOLOGIES

Programme: B. Tech **Year: Second** **Semester: III**
Course: Core **Credits: 3** **Hours: 42**
Quizzes: minimum 2

Objectives and/or special features of the course (~25 words):
The objective of the course is to make mechanical engineering students sufficiently familiar with various relevant aspects of modern electrical and electronics engineering technologies.

Prerequisite Courses: NIL

Course Outcomes (COs):

After the completion of the course, the student:		
CO1	Should be able to describe, design and analyze the various electrical measuring instruments and transformers	Unit 1
CO2	Should be able to describe and analyze induction motors and other popularly used motors.	Unit 2
CO3	Should be able to describe and analyze the various electrical drives used in real-world.	Unit 3
CO4	Should be able to describe the various methods used in electrical heating systems	Unit 4
CO5	Should be able to describe the various signal-sensing and various signal-conditioning techniques (based on Operational Amplifiers or otherwise).	Unit 5

Proposed Curriculum (separated into 4-5 (not more than that) units each corresponding to approximately 10 contact hours):

Topics	**Lecture Hours**		**Student Development**
UNIT – I (8 lectures) **1. Topic : Electrical Measuring Instruments**		8	Employability and Skill Development
Rehash of EE fundamentals (current, voltage, power, energy, Mean Value, RMS Value, Single-Phase versus Three-Phase, etc.), Analog vesus Digital Instruments, Deflection-Type versus Null-Type Instruments, Moving-Coil Galvanometer, Voltmeter, Ammeter, Ohmmeter, Multimeter, Wattmeter, Energy Meter, Cathode Ray Oscilloscope (CRO)	8		
UNIT – II (12 lectures) **2. Topic : Transformers and Motors**	8	8	Employability and Skill Development

Theory and Construction of Transformers, Induction Motors, BLDC Motors, Universal Motors, Servo Motors, and Stepper Motors			
UNIT – III (04 lectures) **3. Topic : Electrical Drives**	8	8	Employability and Skill Development
Group Drive versus Individual Drive, Selection of Motors for Cranes, for Textile Mills, for Paper Mills, for Sugar Mills, for Steel Rolling Mills, for Cement Mills, and for Pumps and Blowers.			
UNIT – IV (04 lectures) **4. Topic : Electrical Heating**	8	8	Employability and Skill Development
Resistance Heating, Direct Arc Furnace, Indirect Arc Furnace, Induction Heating, Dielectric Heating, High-Frequency Eddy-Current Heating			
UNIT-V (12 lectures) **5. Topic : Digital Electronics**	8	8	Employability and Skill Development
Transducers and sensors, ADCs and DACs, Encoders and Decoders, OPAMP-based circuits, Microprocessors and Microcontrollers.			

Grading Policy (With Weightage)

Item	**Weightage (%)**
Mid Semester Exam or Individual/Group Project	25
End Semester Exam	50
Continuous evaluation (Attendance Record, Quizzes, etc.)	25

- **Suggested Readings: (APA Style/ IEEE format)**

Text Books:

1. *TBD*

Reference Books: TBD

URL for the course (optional): TBD

Content Last Modified: July 2017

Instructor(s) name (s): R. Tomar