هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

T-104
2022

Course Specification

Course Title:	Electrical Machines I
Course Code:	212 EPET
Program:	Electrical Power Engineering Technology (EPET)
Department:	Electrical Engineering Technology (EET)
College:	College of Applied Industrial Technology (CAIT)
Institution:	Jazan University
Version:	T-104 - 2022
Last Revision Date:	

Table of Contents:

A. General Information about the Course

Course Identification	
1. Credit Hours:	3
2. Course Type:	
a. University ☐ College ☐ Department ☑ Track ☐ Others ☐	
b. Required ☑ Elective ☐	
3. Level/year at which this course is offered:	5th Level 2nd Year

4. Course General Description

This is a fundamental module on electrical machines, introducing students to the concepts, principle of operations, construction and applications of DC machines and single-phase transformers. This module provides close insight into the study of electrical machines and drives. Laboratory part of the course is covered through very well designed experiments and futuristic equipment. The course is introduced through 2-hrs theoretical and 2-hrs practical classes weekly.

5. Pre-requirements for this course (if any):	111 EPET
6. Co- requirements for this course (if any):	-------

7. Course Main Objective(s):

• To understand the basic concepts used in electrical machines e.g. electromagnetism.
• To understand the construction, principle and working of single phase transformer.
• To understand series and parallel connection of two single phase transformers.
• To understand the possible combinations of star and delta in three-phase transformers.
• To refresh 3-phase power concepts (Active, reactive and real power).
• To understand the construction, principle and working of DC machines (motor and generator)

1. Teaching Mode: (Mark all that apply)

No	Mode of Instruction	Contact Hours	Percentages
1	Traditional classrooms	24	50.0%
2	E-learning	0	0.0%
3	Hybride * Traditional classrooms * E-learning	24	50.0%
4	Distance learning	0	0.0%

2. **Contact Hours (based on the academic semester)**

No	Activity	Contact Hours
1	Lectures	24
2	Laboratory/Studio	24
3	Field	0
4	Tutorial	0
5	Others (specify)	0
	Total	**48**

Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes (CLOs)	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Recall electromagnetism and basic electrical concepts.		Structured Lectures Worked Examples	Exams Homework
2.0	**Skills**			
2.1	Explain single phase and three phase transformers.		Structured Lectures Collaborative Learning	Exams Oral
2.2	Calculate the value of line and phase parameters in three phase connection.		Structured Lectures Collaborative Learning	Exams Oral
2.3	Explain the basic concepts of DC machines.		Structured Lectures Worked Examples	Exams Homework
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate the ability to work independently and meet deadlines.		Questioning Worked Examples	Oral Homework

C. Course Content

No	List of Topics	Contact Hours
1	Basic electrical concepts Introduction of lab Experiment lab 1	6
2	Transformer Ideal transformer Experiment lab 2	6
3	Types of transformers Series connection of two single phase transformer Parallel connection of two single phase transformers	6
4	Three-phase transformers Delta connection 3-phase 4-wire star connections	6
5	Basic principle of electrical machines Experiment lab 5	6
6	Basic principle of motor Basic principle of generator Basic principles of electrical machines	6
7	DC machines Experiment lab 7 Experiment lab 8	6
8	Review of Theoretical Content	6
	Total	**48**

D. Students Assessment Activities

No	Assessment Activities	Assessment Timing (In Week No)	Percentage of Total Assessment Score
1	Home work and Class activities	All Weeks	10%
2	Mid Term	Week 5	20%
3	Lab performance	All Weeks	10%
4	Lab presentation	As Scheduled	10%
5	Final Exam (Lab)	As Scheduled	20%
6	Final Exam	As Scheduled	30%

* Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities

1 References and Learning Resources

Essential References	1	• Lecture notes and PowerPoint Lectures printout.
	2	• Lucas-Nulle Laboratory kits Manuals.
Supportive References	1	• Gonen T. Electrical Machines with MATLAB®. Crc Press; 2011 Nov 16.
	2	• Gieras JF. Electrical Machines: Fundamentals of Electromechanical Energy Conversion. Crc Press; 2016 Oct 14.
Electronic Materials	1	• Animated videos
	2	YouTube
Other Learning Materials	1	Datasheets
	2	Manuals

2 Required Facilities and Equipment

Items	Resources
Facilities (Classrooms, Laboratories, Exhibition rooms, Simulation Room, etc.)	Suitable Classroom Suitable Lab Whiteboard Suitable number of chairs
Technology Equipment (Projector, Smart Board, Software)	Projector Smart Board Suitable Software
Other Equipment (Depending on the nature of the specialty)	vith different apparatus kits by l

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Method
Effectiveness of Teaching	Student	Indirect
	Program Coordinator	Indirect
Quality of Learning Resources	Program Coordinator	Indirect
The extent to which CLOs have been achieved	Course Instructor (Faculty)	Direct
Other		

G. Specification Approval Data

Council/Committee	Electrical Engineering Technology (EET)
Reference Number	CAITEET23041
Date	3/9/2023