هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

Course Specifications

Course Title:	**MOTOR CONTROL SYSTEM**
Course Code:	**261 EPET**
Program:	**DIPLOMA ENGINEERING**
Department:	**ELECTRICAL POWER ENGINEERING TECNOLOGY**
College:	**CAIT**
Institution:	**JAZAN UNIVERSITY**

Table of Contents

A. Course Identification **3**

6. Mode of Instruction (mark all that apply) 3

B. Course Objectives and Learning Outcomes **3**

1. Course Description 3

2. Course Main Objective 3

3. Course Learning Outcomes 4

C. Course Content **4**

D. Teaching and Assessment **5**

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods 5

2. Assessment Tasks for Students 5

E. Student Academic Counseling and Support **6**

F. Learning Resources and Facilities **6**

1.Learning Resources 6

2. Facilities Required 6

G. Course Quality Evaluation **6**

H. Specification Approval Data **7**

A. Course Identification

1. Credit hours: 3 hrs
2. Course type **a.** University ☐ College ☐ Department ☒ Others ☐ **b.** Required ☐ Elective ☒
3. Level/year at which this course is offered: Final level/3rd year
4. Pre-requisites for this course (if any)**:** 221 EPET
5. Co-requisites for this course (if any)**:** None

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	60	100
2	**Blended**	--	--
3	**E-learning**	--	--
4	**Distance learning**	--	--
5	**Other**	--	--

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	30
2	**Laboratory/Studio**	30
3	**Tutorial**	--
4	**Others** (specify)	--
	Total	**60**

B. Course Objectives and Learning Outcomes

1. Course Description

The course introduces basic concepts and theory of installation, operation, and maintenance of motor control devices commonly used in the electrical construction industry. Skills in testing, troubleshooting, and safety techniques will be developed through hands-on training and the use of field-simulated problems. In addition, this course includes a discussion of the theory and the practical application of transformers as used in the electrical industry. Writing assignments, as appropriate to the discipline, are part of the course.

The course is introduced through 2-hrs theoretical and 2-hrs practical classes weekly.

2. Course Main Objective

- Introduce students to the various types of AC and DC drives of electric machine
- Introduce students to the operating principles, methods of starting and controlling of electrical machine with application.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
1.2	Compare the basic parameters for speed control of electric motors.	K1
2	**Skills :**	
2.1	Distinguish the construction, theory and applications of main types of DC machines	S1
2.2	Analyse the microcontroller programming techniques to control the motors.	S2
2.4	Develop the ability to analyse computer programming and its application.	S4
3	**Values:**	
3.2	Demonstrate the ability to work independently in the class and cooperate with the classmates to meet deadlines.	V1, V2

C. Course Content

No	List of Topics	Contact Hours
1	Various types of DC motor and their characteristics Speed control of DC motors	10
2	Testing of DC machine by various methods	8
3	Introduction to C++ language	4
4	Function of symbol and its application in C++	4
5	C++ Programming to control speed of the motor	4
6	C++ Programming to design MPPT	6
7	**Sheet 1** **-Experiment lab 1** Permanent Magnet DC motor • Modelling • Identification • Speed control	4

8	**Sheet 2**
	-Experiment lab 2
	DC motor
	• Control of speed
	  • Speed control
	  • Using armature current
		4

9	- **Sheet 3** **-Experiment lab 3** • Programming C++ • Basic Symbols Chart • Applications	4

10	Sheet 4 • Microcontroller programming using C++ language • DC motor control using H-bridge motor driver L293D 16 pin chip Application	4
11	Sheet 5 • Microcontroller programming using C++ language • DC motor control via DC to DC converter using solar panel • Application	6
8	Revision of theory through tutorial.	2
Total		60

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.2	Differentiate among different categories of DC and AC motor control methods with their functionality, use, and installation	Lecture, tutorial, active learning	Quizzes, class activities, exams
2.0	**Skills**		
2.1	Analysis, the DC motor with proper selection of basic elements.	Lecture, tutorial, active learning	Quizzes, class activities, exams
2.2	Analyse and design the microcontroller programming techniques to control the motors		
2.4	Develop the ability to analyse computer programming and its application	Lab assignments	Lab exam
3.0	**Values**		
3.2	Demonstrate the ability to work independently in the class and cooperate with the classmates to meet deadlines.	Active learning	Participation in classroom

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Assignment/Quiz	4th week	5%
2	Homework/Quiz	11th week	5%
3	Lab Exam	13th week	20%
4	Midterm	8th week	20%
5	Final exam	As scheduled	50%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice : Office hours are specified and instructors can be reached through emails.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	• Nagrath & D.P.Kothari, " Electrical Machines", Tata McGraw. • A.E. Fitggerald, C.Kingsley Jr and Umans, "Electric Machinery", McGraw Hill, International Student Edition. • Husain Ashfaq , " Electrical Machines", Dhanpat Rai & Sons. • E.Balagurusamy "Programming in C". Tata McGraw Hill • Ulla Kirch-Prinz and Peter Prinz, "A Complete Guide to Programming in C++", JONES AND BARTLETT PUBLISHERS	
Essential References Materials	• P.S. Bimbhra, " Generalized Theory of Electrical Machines", Khanna Publishers • Lecture Notes	
Electronic Materials	• Using Laptop, PC, Projector and etc	
Other Learning Materials	• Online animated lectures	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	• A separate demonstrated room is needed for every faculty
Technology Resources (AV, data show, Smart Board, software, etc.)	• Require smart board
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	• A project lab facilities and separate department libarary are needed

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Confidential student Course Evaluation Survey	Institution	Online Direct Survey
End of semester CLO	Course Coordinator	Direct Survey

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	03
Reference No.	01/03/1441/1442
Date	03/03/2021