Course Specification
(Bachelor)

Course Title:	Computer Applications
Course Code:	100-CSC-2
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	Version 1
Last Revision Date:	26/1/2026

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A. General information about the course:

1. Course Identification

1. Credit hours: (2)					
2 (1,1,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☒ University	☐ College	☐ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (1st/1)					
4. Course General Description:					
This course allows students to explore the concept of computing in the field of information technology while learning skills applicable to any professional setting. Through a series of hands-on activities, students will create documents, presentations, and other professional communications. Regular engagement in active learning ensures students can continually refine the skills necessary to prepare them for work. In addition, students will evaluate the qualifications required for specific careers so they can identify opportunities that are of interest to them.					
5. Pre-requirements for this course (if any)**:**					
NA					
6. Co-requisites for this course (if any)**:**					
NA					
7. Course Main Objective(s):					
1. Introduce basic concepts of computing and information technology. 2. Develop practical skills in using computers and Microsoft Office applications. 3. Enable students to use the internet and web applications effectively. 4. Enhance students' ability to manage and process digital information. 5. Prepare students with essential computer skills for academic and professional use.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0

No	Mode of Instruction	Contact Hours	Percentage
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	15
2.	**Laboratory/Studio**	30
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		45

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Define the basic concepts of computing and their impact today.	7	Lectures	Quiz, midterm and final exams
1.2	Describe the terms (data, Information, security, internet and network)	7	Lectures	Quiz, midterm and final exams
1.3	Clarify Basic knowledge of computers and associated software, and their importance in data processing Information and its applications in business.	7	Lectures	Quiz, midterm and final exams
1.4	Using Microsoft Office app to create, edit, and enhance presentations.	7	Lectures, Group Discussion	midterm and final exams, assignments
1.5	Use browser applications to navigate web-based information sources and applications.	7	Lectures, Group Discussion	midterm and final exams, assignments

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
2.0	**Skills**			
2.1				
2.2				
2.3				
2.4				
3.0	**Values, autonomy, and responsibility**			
3.1				
3.2				
3.3				

C. Course Content

No	List of Topics	Contact Hours
1.	History of Computing and the concept of computing	5
2.	Component of computing (hardware, software)	5
3.	Internet concept,	5
4.	Introduction to Networking and Cloud Computing	8
5.	New technologies and applications	6
6.	Microsoft Office applications	9
7.	New technologies and applications	7
Total		0

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz 1 & 2	2rd4 & rd week	**10**
2.	Lab 1	5th week	**10**
3.	Mid Term Exam	6th week	**20**
4.	Final Lab	9th week	**10**
5	Final Exam	At the end of the semester as determined by the academic calendar	**50**
Sum			**100**

*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	• Yahya Halabi A Talib syre. Introduction to computer and problem solving. Dar wael amman Jordan. • Gwilys lodwick. The application of computer in diagnostic radiology (2009). • Russelle V. Application of computer in diagnostic radiology.
Supportive References	Web Sites etc http://www.computing2014.com/ (Computing Essentials).
Electronic Materials	• Computer-based programs/CD, professional standards/regulations. • Microsoft Office
Other Learning Materials	• Yahya Halabi A Talib syre. Introduction to computer and problem solving. Dar wael amman Jordan • Gwilys lodwick. The application of computer in diagnostic radiology (2009). • Russelle V. Application of computer in diagnostic radiology.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms to accommodate 20 students per classroom with desks and chairs
Technology equipment (projector, smart board, software)	Data show needs to maintenance regularly.
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester to identify weaknesses in the course.
Effectiveness of Students assessment	Students	Feedback from Test 1, Test 2, and Final exam records.
Quality of learning resources	Students	A questionnaire is administered at the end of every semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)
Assessment Methods (Direct, Indirect)

G. Specification Approval Data

COUNCIL/COMMITTEE	Electrical Engineering Department Council
REFERENCE NO.	14470730-1471-00010
DATE	16/1/2026

Course Specification
(Bachelor)

Course Title:	English Language Skills (1)
Course Code:	111-ENG-4
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	Version 1
Last Revision Date:	26/1/2026

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A. General information about the course:

1. Course Identification

1. Credit hours: (4)					
4 (4,0,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☒ University	☐ College	☐ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (1st/1)					
4. Course General Description:					
This course is taught to preparatory year students (Paths and Specialties). It helps students to build the language skills they need for their studies. It also provides students with the knowledge of two basic skills of the English language: listening, and speaking, as well as grammar through various activities based on a task-based approach and critical thinking. It develops students' ability to think critically in an academic context as they start their language learning.					
5. Pre-requirements for this course (if any)**:**					
NA					
6. Co-requisites for this course (if any)**:**					
NA					
7. Course Main Objective(s):					
The course aims to bring students to the basic skills of listening and speaking in academic English. It provides students with a solid foundation in English language skills based on a task-based approach and critical thinking with specific activities using digital classroom material which motivate practice in listening and speaking, critical thinking, and enable students to communicate effectively in a variety of everyday situations; and learn how to think in an academic context.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom		0
2	E-learning		0
3	Hybrid	64	100

No	Mode of Instruction	Contact Hours	Percentage
	• Traditional classroom • E-learning		
4	Distance learning		0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	64
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		64

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	To recognize the basic repertoire of words and phrases, basic skills in listening & speaking, features of an authentic audio recording, and various grammatical structures.	7	Presentation Explanation Discussion Pair Work Group Work Practice Activities	Continuous Assessment, Midterm and Final Exams
1.2	To recall the specific details in an authentic audio recording.	7	Presentation Explanation Discussion Pre-Listening tasks Playing recordings Top-Down and Bottom-Up Listening Practice Practice Activities	Continuous Assessment, Midterm and Final Exams
2.0	**Skills**			

2.1	inferences using contextual visuals in a talk as they listen to authentic audio recordings.	3	Showing and telling anecdote Humming Role Play/ Simulation Practice Activities	Midterm and Final Exams
2.3	To identify criteria, ideas, and information of various graphs, diagrams, charts, etc.	3	Presentation Drilling Showing and telling anecdote Role Play/ Simulation Practice Activities	Continuous Assessment, Midterm, Final Exams
2.4	To listen to various situations in spoken English such as conversations, interviews, presentations, and lectures that are carefully articulated, with long pauses to assimilate meaning. different types of intonation and stress.	3	Presentation Explanation/ Metacognition Discussion Graphic and semantic organizers Practice Activities	Continuous Assessment, Midterm and Final Exams
2.5	To express themselves in spoken English using appropriate pronunciation, intonation and fluency, in a variety of contexts, such as conversations, presentations, and interviews.	3	Presentation Explanation Discussion Pair Work Group Work Practice Activities Homework	Continuous Assessment, Midterm and Final Exams
3.0	**Values, autonomy, and responsibility**			
3.1	To participate (ethically) in various academic tasks, assignments, and activities while learning about other cultures, morals, habits, and ways of thinking.	4	Discussion on morals Responsibilities Presentation on motivation/professional ethics	Survey / Checklist
3.2				

C. Course Content

No	List of Topics	Contact Hours
1.	People	**8**
2.	Seasons	**8**
3.	Lifestyle	**8**
4.	Places	**8**

5.	Jobs	**8**
6.	Homes and Buildings	**8**
7.	Food and Culture	**8**
8.	Transport	**8**
Total		**64**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Continuous Assessment (Speaking)	Throughout the semester	**20**
2.	Midterm Exam	8th week	**30**
3.	Final Exam	At the end of the semester as determined by the academic calendar	**50**
Total			**100**

*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	Unlock1 Listening, Speaking &Critical Thinking Student's book with digital pack By: N.M. White, Susan Peterson and Nancy Jordan with Chris Sowton Cambridge University Press
Supportive References	Online video, Digital classroom material, and Digital workbook
Electronic Materials	www.cambridge.org
Other Learning Materials	Individual teachers' learning materials on Blackboard

2. Required Facilities and equipment

Items	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms/labs in college building
Technology Resources (AV, data show, Smart Board, software, etc.)	AV, Computers, Speakers, Projectors, Smart Board, Software, etc

Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Smart Classroom, English Lab, Students' conference hall

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Department/FD Unit	Peer observation
Effectiveness of students assessment	Quality Unit/Department	Exams
Quality of learning resources	Students/Department Unit	Online Observation
The extent to which CLOs have been achieved	Department/Quality Unit	Direct
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

Course Specification
(Bachelor)

Course Title:	English Language Skills (2)
Course Code:	112-ENG-4
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	Version 1
Last Revision Date:	26/1/2026

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A. General information about the course:

1. Course Identification

1. Credit hours: (4)					
4 (4,0,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☒ University	☐ College	☐ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (1st/1st)					
4. Course General Description:					
This course is taught to preparatory year students (Paths and Specialties). It helps students to build the language skills they need for their studies. It also provides students with knowledge of two basic skills of the English language: reading and writing, as well as grammar through various activities based on a task-based approach and critical thinking. It develops students' ability to think critically in an academic context as they start their language learning.					
5. Pre-requirements for this course (if any)**:**					
NA					
6. Co-requisites for this course (if any)**:**					
NA					
7. Course Main Objective(s):					
The course aims to bring students to the basic skills of reading and writing in academic English. It provides students with a solid foundation in English language skills based on a task-based approach and critical thinking with specific activities using digital classroom materials which motivate practice in reading and writing, and critical thinking and enable students to learn how to think in an academic context.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	0	0
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	64	100
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	64
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		64

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	To recognize the basic repertoire of words and phrases, and basic skills in reading and writing.	7	• Presentation • Explanation • Discussion • Pair Work • Group Work • Practice Activities	Continuous Assessment, Midterm and Final Exams
1.2	To demonstrate the basics of simple grammatical structures and sentence patterns featured in various content.	7	• Presentation • Explanation • Discussion • Pre-Listening tasks • Playing recordings • Top-down and • Bottom-Up • Listening Practice • Practice Activities	Continuous Assessment, Midterm and Final Exams
1.3	To read simple types of texts such as short academic texts, news articles, profiles, and short stories.	7	• Presentation • Drilling • Showing and telling • Humming • Role play/Simulation	Continuous Assessment, Midterm and Final Exams
2.0	**Skills**			
2.1	To write various types of sentences, using correct sentence structure and punctuation.	3	• Presentation • Drilling • Showing and telling • Role Play/Simulatio	Continuous Assessment, Midterm, Final Exams

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
			n • Practice Activities	
2.2	To apply basic skills of reading such as skimming, scanning, reading for detail, previewing, annotating, collecting, categorizing, analyzing information.	3	• Presentation • Explanation/ • Metacognition • Discussion • Pre-Reading tasks • Reading Aloud/Silent • Graphic and semantic organizers • Practice Activities	Continuous Assessment, Midterm and Final Exams
2.3	To compose various types of texts: simple and descriptive sentences, descriptive and comparative paragraphs, and emails using correct sentence structure, punctuation, and paragraph organization.	3	• Presentation • Explanation/ • Metacognition • Discussion • Pre-Reading tasks • Reading Aloud/Silent • Practice Activities	Presentation Explanation Discussion Pair Work Group Work Practice Activities
3.0	**Values, autonomy, and responsibility**			
3.1	To participate (ethically) in various academic tasks, assignments, and activities while learning about other cultures, morals, habits, and ways of thinking.	4	Presentation on motivation/professional ethics	Discussion on moral/Responsibilities

C. Course Content

No	List of Topics	Contact Hours
1.	People	**8**
2.	Seasons	**8**
3.	Lifestyle	**8**
4.	Places	**8**
5.	Jobs	**8**
6.	Homes and buildings	**8**
7.	Food and Culture	**8**
8.	Transport	**8**
Total		**64**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Continuous Assessment (E-Assignments)	Throughout the semester	20
2.	Midterm Exam	8th week	30
3.	Final Exam	At the end of the semester as determined by the academic calendar	50
Total			**100**

*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	Unlock1 Reading, Writing &Critical Thinking Student's book with digital pack By: Sabina Ostrowska and Kate Adams with Chris Sowton Cambridge University Press
Supportive References	Online video, Digital classroom material, and Digital workbook
Electronic Materials	www.cambridge.org
Other Learning Materials	Individual teachers' learning materials on Blackboard

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms/labs in college building
Technology equipment (projector, smart board, software)	AV, Computers, Speakers, Projectors, Smart Board, Software, etc
Other equipment (depending on the nature of the specialty)	Smart Classroom, English Lab, Students' conference hall

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Peer reviewer	Department/FD Unit
Effectiveness of Students assessment	Students	Quality Unit/Department
Quality of learning resources	Students	Students/Department Unit
The extent to which CLOs have been achieved	Teaching staff	Department/Quality Unit
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)
Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

Course Specification
(Bachelor)

Course Title:	Introduction to Mathematics
Course Code:	121-MAT-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	Version 1
Last Revision Date:	26/1/2026

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A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (3,0,1) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☒ University	☐ College	☐ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (4)					
4. Course General Description:					
This course is designed to cover topics in Algebra enhanced with pre-algebra topics such as arithmetic, fractions, and word problems as need, Sets and Real Numbers, Exponents and Radicals, Rational Expressions, Linear Equations and Linear Inequalities in one variable, Equations and Inequalities Involving absolute Value, Quadratic Equations, Functions and graphs, polynomials and Rational Functions, Combining Functions, logarithmic Functions and Exponential Functions, Matrices and determinants, Systems of Linear equations, Arithmetic sequences and series and Geometric sequences and series.					
5. Pre-requirements for this course (if any)**:**					
NA					
6. Co-requisites for this course (if any)**:**					
NA					
7. Course Main Objective(s):					
Students are able to build a strong and sound understanding of Pre-calculus as a solid foundation for subsequent courses in mathematics and other disciplines as well as for applying it in real life.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	15
5.	**Others (specify)**	
Total		45

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Describe the basic concepts and properties of sets, real numbers, algebraic expressions, equations and inequalities, functions, matrices, systems of equations, and sequences and series.	**1**	• Lectures • Cooperative learning • Problem solving • Brain storming • Self-Learning	• Midterm • Assignment • Homework • Final Exam
2.0	**Skills**			
2.1	Solve linear, quadratic, exponential, logarithmic equations, absolute value equations/inequalities, and systems of linear equations.	**2**	• Lectures • Cooperative learning • Problem solving • Brain storming Self-Learning	• Midterm • Assignment • Homework • Final Exam
2.2	Find the domain of polynomial, rational, radical, exponential, logarithmic, and composite functions, and determine terms and sums of arithmetic and geometric sequences and series.	**6**	• Lectures • Cooperative learning • Problem solving • Brain storming Self-Learning	• Midterm • Assignment • Homework • Final Exam
2.3	Apply properties of exponential and logarithmic functions, rewrite and evaluate logarithms, find intercepts, and work with arithmetic and	**6**	• Lectures • Cooperative learning • Problem	• Midterm • Assignment • Homework • Final Exam

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	geometric sequences and series.		solving • Brain storming Self-Learning	
3.0	**Values, autonomy, and responsibility**			
3.1	Develop the ability and confidence necessary to solve mathematical problems.	**4**	• Lectures • Scientific discussions	• Oral Exam
3.2	Demonstrate self-learning, independent and teamwork skills, and participate in competitions.	**5**	• Lectures • Scientific discussions	• Oral Exam

C. Course Content

No	List of Topics	Contact Hours
1.	**Real Number System**	
1.1	Sets and Real Numbers.	**3**
1.2	Exponents and Radicals	**3**
1.3	Rational Expressions.	**3**
2	**Equations and Inequalities**	
2.1	Linear Equations and Applications.	**2**
2.2	Linear Inequalities	**3**
2.3	Equations and Inequalities Involving Absolute Value	**3**
2.4	Quadratic Equations and Applications.	**2**
4	**Function**	
4.1	Functions	**3**
4.2	Polynomials and Rational Functions	**3**
4.5	Combining Functions	**2**
5	**Exponential and Exponential**	**3**
5.1	Exponential Functions	
5.2	Logarithmic Functions	**3**
6	**Systems of Equations and Matrices**	
6.1	Matrices and Determinants	**3**
6.1	Systems of Linear Equations	**3**
8	**Sequences and Series**	

8.2	Arithmetic's Sequences and Series	**3**
8.3	Geometrics Sequences and Series	**3**
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm Exam	Week 7/Week 8	**30**
2.	Assignments & Quizzes	During classes	**20**
3.	Final Exam	At the end of the semester as determined by the academic calendar	**50**
Total			**100**

*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	T. Ghazal, O. ALGahtani, K. Kashan, M. Damlakhi and S. Alofei, **Pre-calculus,** King Saud University, 2nd Edition
Supportive References	• J. Stewart, L. Redlin, Salem Watson, Pre-calculus: Mathematics for Calculus, Cengage Learning; 7th edition (January 1, 2015) • Raymond A. Barnett, Michael R. Ziegler, Karl E. Byleen, College • Algebra with Trigonometry, McGraw-Hill Science, 8th edition (February 16, 2007). • Raymond Barnett, Michael Ziegler, Karl Byleen , David Sobecki, Precalculus: Graphs and Models, McGraw-Hill Inc., US; 3rd edition (16 March 2008)
Electronic Materials	https://www.ck12.org/book/CK-12-Calculus-Concepts/section/1.7/ https://zr9558.files.wordpress.com/2013/10/thomas_calculus.pdf
Other Learning Materials	**none**

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom
Technology equipment	Data Show

(projector, smart board, software)	Free software as (Geogebra) https://www.geogebra.org/graphing
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Questioner (Indirect)
Effectiveness of Students assessment	Lecturer	Software (Direct)
Quality of learning resources	all	Questioner (Indirect)
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

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

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

Course Specification
(Bachelor)

Course Title:	General Physics
Course Code:	141-PHY-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	Version 1
Last Revision Date:	26/1/2026

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G. Specification Approval 7

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (2,1,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☒ University	☐ College	☐ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (1st/1st)					
4. Course General Description:					
This course is concerned with the student's knowledge of the basic concepts of physics. In addition, Heat, electricity, optics, sound, and the principle of radiation. The course also covers experiments related to these branches of physics.					
5. Pre-requirements for this course (if any)**:**					
NA					
6. Co-requisites for this course (if any)**:**					
NA					
7. Course Main Objective(s):					
1. To provide the students with the basic concept of physics. 2. To demonstrate some physical phenomena. 3. To demonstrate some basic physics experiments. 4. To build up scientific analytical thinking and skills in the context of physics. 5. To develop problem solving skills in a physics context.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	30
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		60

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Understanding of the fundamentals of physics branches such as, types of motion, electricity, light, sound, heat, properties of matter and radiation.	7	Lecture Dialogue and discussion	semester exam Final exam Homework
2.0	**Skills**			
2.1	Students can use mathematics to deal with physical phenomena and compare the obtained results with experiments and observations.	6	Lecture Dialogue and discussion	semester exam Final exam Homework
3.0	**Values, autonomy, and responsibility**			
3.1	Students should be able to work independently as well as work in groups, interacting constructively with others.	5	Lecture Dialogue and discussion	semester exam Final exam Homework reports

3.2	To have the ability to self-assess the level of learning and performance, insist on achievement and excellence, and make rational decisions supported by evidence and arguments independently	4	Lecture Dialogue and discussion	semester exam Final exam Homework reports

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to basic concepts of physics: -Types of motion (translational motion and periodic motion) -Displacement, Velocity, Acceleration, momentum, Forces - Newton's laws of motion - Work and energy.	5
2.	Heat: heat and temperature - methods of temperature measurement - quantity of heat and specific heat - methods of heat transfer.	5
3.	Electricity: Coulomb's law- electric field- electric potential- resistivity - electrical current and Ohm's law.	5
4.	Light: the nature and diffusion of light - reflection of light - refraction of light.	5
5.	Sound: Properties of sound –speed of sound - Intensity of sound – Types of sound waves	5
6.	Principle of radiation: atomic structure and nucleus components – Nuclear binding energy – Types of radiation (Alpha particles –Beta particles – gamma ray - X-ray).	5
7.	Experiments: - Fine measurements (Vernier caliper – Micrometer-Spherometer) - Specific heat capacity of a solid. - Ohm's Law. - Meter bridge experiments - Refractive index of glass - Convex lens - Concave mirrors - Speed of sound in the air.	30
Total		48

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Mid semester exam (theoretical part)	6-8	20
2.	semester exam (experimental part)	6-8	10
3.	Homework	1-10	5
4.	Reports on (experimental part)	1-10	5
5.	Final exam (experimental part)	13	10
6.	Final exam	At the end of the semester as determined by the academic calendar	50
Total			**100**

*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	Raymond A. Serway John W. Jewett, Physics of Scientists and Engineers, Sunders College Publication
Supportive References	David Halliday, Robert Resnick, Jearl Walker, Fundamentals of Physics (11Ed), 2018, weilly.
Electronic Materials	http://sciencebooksonline.info/physics.html
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom (20 seats). Laboratories (20 seats).
Technology equipment (projector, smart board, software)	Pc + data show
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of students assessment	Peer Reviewer	Direct
Quality of learning resources	Faculty, Students	Indirect
The extent to which CLOs have been achieved	Faculty, Students	Direct Indirect
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

Course Specification
(Bachelor)

Course Title:	Programming Principles
Course Code:	101-CSC-3
Program:	Bach Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	Version 1
Last Revision Date:	26/1/2026

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A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (2,1,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☒ University	☐ College	☐ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (2nd/1st)					
4. Course General Description:					
The course deals with the principles of computational thinking, solving, and analyzing problems, and principle of designing and evaluating algorithms.					
5. Pre-requirements for this course (if any)**:**					
NA					
6. Co-requisites for this course (if any)**:**					
NA					
7. Course Main Objective(s):					
The course aims to teach students the basic knowledge and skills to solve problems using computational thinking and apply that by using a programming language.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	0
3.	**Field**	0

4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		45

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Explain the essential principles and concepts of computational thinking in solving problems.	7	- Interactive Lectures using PowerPoint slides and explaining the essential points in more detail with the help of whiteboard. - Encouraging the students to use the online links to know the concepts in detail. - Recall the topics discussed in the last lecture by asking questions to the students. - Motivating students to be active during class by asking questions regularly during the lecture. - Associating the topics in with the course learning outcomes (CLO).	Quizzes Assignment, Mid and Final Exams
1.2	Explain the basics of designing algorithms to solve problems.	1	- Interactive Lectures using PowerPoint slides and explaining the essential points in more detail with the help of whiteboard. - Encouraging the students to use the online links to know the concepts in detail. - Recall the topics discussed in the last lecture by asking questions to the students. - Motivating students to be active during class by asking	Quizzes Assignment, Mid and Final Exams

			questions regularly during the lecture. - Associating the topics in with the course learning outcomes (CLO).	
2.0	Skills			
2.1	Describe, and represent a sequence of steps and decisions (algorithms) needed to solve simple problems	2	Cooperative Learning, Inquiry-based instruction, class discussion, problem-based learning Lab	Assignment, Mid and Final Exams, Labs, Project
2.2	Write and implement basic programs using computational thinking concepts.	6	Cooperative Learning, Inquiry-based instruction, class discussion, problem-based learning Lab	Labs, Project
3.0	Values, autonomy, and responsibility			
3.1	The ability to solve problems using computational thinking	4	Cooperative Learning, Inquiry-based instruction, class discussion, problem-based learning Lab	Assignment, Mid and Final Exams, Labs, Project
3.2	The ability to solve problems and write programs with collaboration and teamwork in mind.	5	Cooperative Learning, Course Project Project	Labs, Project

*Code of CLOs in Table B aligns with Computer Science Program.

C. Course Content

No	List of Topics	Contact Hours
1.	An introduction to computational thinking	5
2.	Logic and algorithms thinking	5
3.	Problem solving and decomposition	5
4.	Pseudocode and flowchart	9
5.	Anticipating and Dealing with Errors	9
6.	Evaluating a Solution	9
7.	Introduction to Scratch Programming	9
8.	Project: applying all above concepts using Scratch	9
Total		60

D. Students Assessment Activities

No	Assessment Activities *	Assessme nt timing (in week no)	Percentage of Total Assessment Score
1.	Quiz-1	3	5
2.	Assignment	2,7	5
3.	Midterm	6	20
4.	Course Project	8,9	10
5.	Lab Activities	7-10	10
6.	Final Lab Exam	11	10
7.	Final Exam	At the end of the semester as determined by the academic calendar	40
Total			100%

*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	Book: Computational Thinking: A Beginner's Guide to Problem-Solving and Programming. Author: Karl Beecher Publication Year: 2017
Supportive References	Computational Thinking for the Modern Problem Solver. Textbook by David D. Riley and Kenny A. Hunt
Electronic Materials	None
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms to accommodate 50 students per classroom with desks and chairs, labs to accommodate 25 students per lab with advanced computers.
Technology equipment (projector, smart board, software)	Data show, stationaries, smart board, suitable IDE (Netbeans and Eclipse)

Other equipment (depending on the nature of the specialty)	ACs for labs and classrooms, black curtains

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students, faculty, and peer review	Indirect (questionnaires and interviews)
Effectiveness of students' assessment	Faculty and student	Direct and indirect (exams, quizzes, lab works and questionnaires)
Quality of learning resources	Faculty, student, head of department	Written exam
The extent to which CLOs have been achieved	Faculty	Direct and indirect (exams, quizzes, lab works and questionnaires)

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

Course Specification
(Bachelor)

Course Title:	General English
Course Code:	113-ENG-3
Program:	Mechatronics and Robotics Engineering
Department:	Electerical Engineering
College:	Engineering
Institution:	Najran University
Version:	Version 1
Last Revision Date:	26/1/2026

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A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (3,0,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☒ University	☐ College	☐ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (2nd/1st)					
4. Course General Description:					
This is an integrated English-skills and task-based course. It focuses on grammar, vocabulary, speaking, listening, reading, and writing in addition to other communicative tasks and activities. The tasks, while using the authentic materials, present how people use the language in social, professional, academic, and real-life conversations and contexts. The course aims to strengthen and improve students' linguistic and communicative competences through textual and online language inputs and references i.e. vocabulary, reading texts, writing tasks, and other pertinent reviews and practices. The course places a lot of emphasis on providing learners with the grammar building blocks and the necessary vocabulary they need to communicate confidently, critically, and successfully.					
5. Pre-requirements for this course (if any)**:**					
NA					
6. Co-requisites for this course (if any)**:**					
NA					
7. Course Main Objective(s):					
The course aims to provide students with a solid foundation in English language skills: Listening, Speaking, Reading, and Writing that enables them to communicate orally and in written forms effectively, confidently, and critically in social, professional, academic, and real-life situations.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100
2	E-learning	0	0
3	Hybrid • Traditional classroom	0	0

No	Mode of Instruction	Contact Hours	Percentage
	• E-learning		
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		45

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	To recognize language mechanics and functions	1	Presentation Explanation Discussion Pair/Group Work Task-based activities	Continuous assessment Midterm Final Exams
1.2	To state the uses and rules of language mechanics and functions	7	Presentation Explanation Discussion Pair/Group Work Task-based activities	Continuous assessment Midterm Final Exams
2.0	Skills			
2.1	To identify correct main and specific ideas, details, inferences, predictions, opinions, descriptions, points of views, evaluations, suggestions, arguments etc. in written	3	Presentation Explanation Metacognition Discussion Pre-Reading tasks	Continuous assessment Midterm Final Exams

	texts		Graphic and semantic organizers Task-based activities	
2.2	To extract correct main and specific ideas, details, inferences, predictions, opinions, descriptions, points of views, evaluations, suggestions, arguments etc. in spoken situations (authentic listening)	3	Presentation Drilling Pre-Listening tasks Post-listening tasks Playing recordings Task-based activities	Continuous assessment Midterm Final Exams
2.3	To communicate orally in a variety of social, professional, academic, and real-life situations such as talking about actions and events in different time frames, describing, evaluating, making suggestions and plans, invitations, predictions and inferences, reasoning, opinions, etc.	3	Presentation Drilling Showing and telling Humming Role Play Simulation Task-based activities	Continuous assessment Midterm Final Exams
2.4	To write correct grammatical structures, types of texts, and paragraphs such as profiles, descriptions, emails, comparisons, proposals, ads, summaries, stories, etc.	3	Presentation Explanation Discussion Pair/group work Task-based activities	Continuous assessment Midterm Final Exams
2.5	To use correct language components and vocabulary in different structures and situations	6	Presentation Explanation Discussion Pair/group work Task-based activities	Continuous assessment Midterm Final Exams
3.0	Values, autonomy, and responsibility			
3.1	Demonstrate the ethical ability to engage, prepare, organize, and deliver work on time and participate in (extra) curricular activities,	4	Discussion and sessions on moral values, commitments, and responsibilities (Teacher's/ Advising Unit's task)	Survey Checklist
3.2	discussions, problem-solving, appreciate other cultures, morals, habits and way of thinking that are different from the local ones, and to show positive attitudes, responsibility, commitment, belief of teamwork, and good rapport with classmates and staff members in	5	Discussion and sessions on moral values, commitments, and responsibilities (Teacher's/ Advising Unit's task)	Oral Exam

	college etc.			

C. Course Content

No		List of Topics	Contact Hours
1.	Events		4
2.	Planning		4
3.	Products		4
4.	Decision-making		4
5.	Turning Points		4
6.	Now & Then		4
7.	Performance		4
8.	Plans & Tasks		6
9.	The World of Work		6
10.	Profits & Incomes		5
11.	Problem-solving		4
12.	A Better World		4
		Total	29

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Continuous Assessment	Throughout	20
2.	Midterm Exam	8th week	30
3.	Final Exam	At the end of the semester as determined by the academic calendar	50
		Total	**100**

*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	English for 21st Century (Level 2) by Dina O'Driscoll and Jake Hughes (Garnet Education)
Supportive References	
Electronic Materials	quizlet.info/garnet-c21-level-2 https://content.yudu.com/web/1xxwg/0A27nwn/C21KSAL2CB/h t page=4&origin=reade r
Other Learning Materials	On-blackboard learning materials: Teacher's Weekly Supportive Materials

2. Required Facilities and equipment

Items	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms and English language labs onsite
Technology Resources (AV, data show, Smart Board, software, etc.)	Displays or projectors (highly required), AV, computers/laptops (highly required), smart boards, and software
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Smart and lecture classrooms, and students' conference hall

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Department/FD Unit	Direct: Peer observation
Effectiveness of students' assessment	Quality Unit/Department	Indirect: Exam paper analysis
Quality of learning resources	Students/Department Unit	Indirect: Online observation
The extent to which CLOs have been achieved	Department/Quality Unit	Direct: Students' results analysis
Other		

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

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

Course Specification
(Bachelor)

Course Title:	English for Engineering Specialties
Course Code:	115-ENG-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	Version 1
Last Revision Date:	26/1/2026

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A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (3,0,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☒ University	☐ College	☐ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (2nd/1st)					
4. Course General Description:					
English for Engineering provides students enrolled in mechanical, electrical, chemical, architectural or civil engineering with powerful language tools, including knowledge, terminology, communication skills, critical thinking skills, practical grammar, and vocabulary, with a significant emphasis on acquiring, developing, and enhancing the strategies required for effective listening, speaking, reading, and writing. The course also provides opportunities to practice English in practical situations and gives them the language, information, vocabulary, and required skills to grow their confidence. Ultimately, the course contains specialized language and technical and engineering content that a student needs to master in order to study in the respective fields and work as a competent engineer.					
5. Pre-requirements for this course (if any)**:**					
112-ENG-4					
6. Co-requisites for this course (if any)**:**					
NA					
7. Course Main Objective(s):					
This course aims to provide students with the confidence to communicate fluently, critically, and accurately, using appropriate terminology from their related fields. It also aims to upgrade their listening, speaking, reading and writing skills, current grammatical knowledge and learn numerous practical and engineering terms, expressions and phrases based on both general and specialized vocabulary.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	0	0
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	45	100
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		45

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Recognize correct pronunciation, grammar usage, specialized and non-specialized engineering vocabulary, phrases, idiomatic expressions, sentences, etc. in written & spoken communication	7	Effective lecturing (speech and slide presentation) Worked Examples Pair/teamwork task-based activities Blended learning	Midterm Final exam
1.2	Define engineering, terms, functions, shapes, machines, symbols, processes, etc.	7	Effective lecturing (speech and slide presentation) Pair/teamwork task-based activities Blended learning	Midterm Final exam
1.3	Demonstrate correct use of context-bound grammar, specialized and non-specialized engineering vocabulary, phrases, and expressions	7	Effective lecturing (speech and slide presentation) Worked Examples Pair/teamwork task-based activities Inquiry-based teaching Discussion Blended learning	Continuous assessment Midterm Final exam
2.0	Skills			
2.1	Analyze ideas, details, facts, information, arguments, causes and	3	Effective lecturing (speech and slide	Continuous

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	effects, results, stages, examples, descriptions, components, procedures, processes, tools, etc., in related engineering contexts, effectively in both written and spoken communication		presentation) Worked Examples Pair/teamwork task-based activities Inquiry-based teaching Discussion Blended learning	assessment Midterm Final exam
2.2	Write common types of texts, paragraphs, reports, flow charts, email, instructions, descriptions, warnings, etc. with engineering contexts	3	Effective lecturing (speech and slide presentation) Inquiry-based teaching Discussion Pair/teamwork task-based activities Each-of-unit round-up Blended learning	Continuous assessment Midterm Final exam
2.3	Communicate orally and critically on engineering- related issues and topics	3	Role play/information gap/simulation Pair/teamwork task-based activities Inquiry-based teaching	Continuous assessment Midterm Final exam
3.0	Values, autonomy, and responsibility			
3.1	Demonstrate the ability to engage, prepare, organize, and deliver work on time and participate in (extra) curricular activities, discussions, problem-	4	Discussion/sessions on responsibilities (Teacher's/Advising Unit's task)	Survey Checklist
3.2	Show positive attitudes, responsibility, commitment, belief of teamwork, and good rapport with classmates and staff members in college and in an engineering environment	4	Discussion/sessions on moral values and professionalism in engineering practices (Teacher's/ Advising (Professional) Unit's task)	Survey Checklist

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods

C. Course Content

No	List of Topics	Contact Hours
1.	What is Engineering?.	4
2.	Shapes	3
3.	Materials	3
4.	Tools	3
5.	Energy	3
6.	Simple Machines	3
7.	Working with Numbers	4
8.	Types of Measurement	3
9.	The Scientific Method	4
10.	Safety Precautions	3
11.	Civil Engineering	3
12.	Chemical Engineering	3
13.	Mechanical Engineering	3
14.	Electrical Engineering	3
Total		0

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm	5-6	30
2.	Continuous Assessment (Assignment + Quiz)	All through	20
3.	Final Exam	At the end of the semester as determined by the academic calendar	50
Total			**100**

*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	English Unlimited Special Edition 4, B1+Intermediate course by: David Rea & Theresa Clementson; Published by, Cambridge University Press, 2013.
Supportive References	Azar, B.S.1985. Fundamentals of English Grammar, New Jersey: Prentice Hall Regents; Mazyad, S.S. 2002. English For Academic Purposes. Riyadh; Murphy, R. 1985. English Grammar In Use: A Self-Study Reference and Practice Book for Intermediate Students. London; Soars, John and Liz. New Headway English Course. Elementary. Oxford: CUP; and Swan, M. And Walter, C. 1988. The Cambridge English Course. London: CUP.
Electronic Materials	https://learnenglish.britishcouncil.org/general-english https://www.ef.com/wwen/english-resources/
Other Learning Materials	In addition to the cited textbooks/references, additional materials (PDFs/PPTs/Videos will be uploaded on Bb for students' academic support.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	NA
Technology equipment (projector, smart board, software)	Computer/Laptop/Bb
Other equipment (depending on the nature of the specialty)	NA

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	• Program Leaders	• Direct • Indirect
Effectiveness of students' assessment	• Program Leaders • Exam Committee	• Direct • Indirect
Quality of learning resources	• Faculty • Students	• Direct • Indirect

Assessment Areas/Issues	Assessor	Assessment Methods
The extent to which CLOs have been achieved	• Program Leaders • Quality Coordinator	• Direct • Indirect
Other		

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

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

Course Specification
(Bachelor)

Course Title:	Engineering Drawing
Course Code:	121-GEC-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	Version 1
Last Revision Date:	26/1/2026

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A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (2,1,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☒ University	☐ College	☐ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (2nd/1st)					
4. Course General Description:					
Students in this course will learn how to draw different curves and figures that are used in engineering applications.					
5. Pre-requirements for this course (if any)**:**					
NA					
6. Co-requisites for this course (if any)**:**					
NA					
7. Course Main Objective(s):					

1. Mastering the use of various technical drawing tools to produce high quality and neat drawings.
2. Developing the students' skills in producing professional engineering drawings to present their design ideas.
3. Increasing the students' imaginary design thinking and expanding their design visual language proficiency.
4. Learn the principle of using AutoCAD package in the drawing.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	15
2.	**Laboratory/Studio**	60
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		75

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Know the several drawing instruments and their functional use.	**7**	• Interactive lectures using PowerPoint slides with more examples in the class. • Engaging the students in problem-based learning through examples. • Recall the topics discussed in the last lecture by asking questions to the students.	-Test performance evaluation -Evaluation through assignment sheets
1.2	Translate physical objects into paper and computer drawing models.	**7**	• Interactive lectures using PowerPoint slides with more examples in the class. • Engaging the students in problem-based learning through examples. • Recall the topics discussed in the last lecture by asking questions to the students.	-Test performance evaluation -Evaluation through assignment sheets
1.3	Develop a good foundation of technical drawing skills.	**1**	• Interactive lectures using PowerPoint slides with more examples in the class. • Engaging the students in problem-based learning through examples. • Recall the topics	-Test performance evaluation -Evaluation through assignment sheets

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
			discussed in the last lecture by asking questions to the students.	
1.4	Develop drawing skills for various design elements.	**1**	• Interactive lectures using PowerPoint slides with more examples in the class. • Engaging the students in problem-based learning through examples. • Recall the topics discussed in the last lecture by asking questions to the students.	-Test performance evaluation -Evaluation through assignment sheets
2.0	**Skills**			
2.1	Enhance the communication skills.	**3**	• Interactive lectures using PowerPoint slides with more examples in the class. • Engaging the students in problem-based learning through examples. • Recall the topics discussed in the last lecture by asking questions to the students.	-Test performance evaluation -Evaluation through assignment sheets
3.0	**Values, autonomy, and responsibility**			
3.1	Encourage discussions and new ideas.	**4**	• Interactive lectures using PowerPoint slides with more examples in the class. • Engaging the students in problem-based learning through examples. • Recall the topics discussed in the last lecture by asking questions to the students.	-Test performance evaluation -Evaluation through assignment sheets
3.2	Act responsibly and ethically.	**4**	• Interactive lectures using PowerPoint slides with more examples in the class • Engaging the students in problem-based learning through examples.	-Test performance evaluation -Evaluation through assignment sheets

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Engineering Drawing and its course specifications.	2
2.	Engineering drawing instruments and their properties	6
3.	Applied geometry	12
4.	Orthographic projections (basic views, applied dimensions and lettering vertical sections.	12
5.	Orthographic Projections (missing views)	10
6.	Pictorial drawings (Isometric and oblique)	10
7.	Introduction to Engineering Drawing using AutoCAD (Draw and modify commands)	4
8.	Engineering Drawing using AutoCAD (Layers, Dimensioning, zooming and printing commands)	4
Total		60

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignments	1-14	20
2.	Quizzes	12	10
3.	Mid-term	7 and 12	20
4.	Final exam	At the end of the semester as determined by the academic calendar	50
Total			100%

*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	Cecil H. Jensen; Jay D. Helsel; Dennis R. Short, Engineering Drawing & Design (2007), 7th Edition, McGraw Hill
Supportive References	K. Venugopal, Engineering Drawing & Graphics, New Age International, 2007

Electronic Materials	NA
Other Learning Materials	NA
	N/A

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms and laboratories
Technology equipment (projector, smart board, software)	Projector, AutoCAD lab.
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Peer reviewer	The peer reviewer will monitor the teaching method of teacher during class and assessed him by filling the peer reviewer assessment form.
Effectiveness of Students assessment	Students	Students evaluate the course instructor through survey form.
Quality of learning resources	Students	A questionnaire is given to the students for feedback of syllabus.
The extent to which CLOs have been achieved	Teaching staff	Software program or Excel sheet
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	14470730-1471-00010
DATE	16/1/2026

Course Specification
(Bachelor)

Course Title:	Introduction to Calculus
Course Code:	122-MAT-4
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	Version 1
Last Revision Date:	26/1/2026

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E. Learning Resources and Facilities 6
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A. General information about the course:

1. Course Identification

1. Credit hours: (4)					
4 (4,0,1) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☒ University	☐ College	☐ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (2nd/1st)					
4. Course General Description:					
This course is designed to cover Differential Calculus. It includes limits, continuity, derivatives, and the applications of derivatives. The types of functions studied include algebraic, trigonometric, exponential and logarithmic.					
5. Pre-requirements for this course (if any)**:**					
121-MAT-3					
6. Co-requisites for this course (if any)**:**					
NA					
7. Course Main Objective(s):					
• Students are expected to have a strong and sound understanding of differentiation calculus in terms of its concepts, techniques and theorems. • Students are expected to apply them on studying the behavior of functions					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45

2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		45

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	derivative, increasing, extrema, decreasing, concavity, limits laws, differentiations rules of functions, and the equation of tangent line. Determine limits and continuity at a point from the graph of a function. Using the graph of the first derivative of a function to find the critical numbers, the x coordinate of the local extreme values, the intervals on which fis: increasing, decreasing, concave upward, concave downward, and the X-coordinate of the infection point. Using the graph of the second derivative of a function to find the intervals on which f is concave upward, concave downward and the x coordinate of the infection point.	7	Lecture Cooperative learning Problems solving Brainstorming Self-Learning	Midterm Exam Final exam
1.2	Evaluation of limits, and the discussion of the continuity of a function.	1	Lecture Cooperative learning Problems solving Midterm Exam Final exam	Midterm Exam Final exam
1.3	To find the derivative of functions (in 1st degree, or high degree).	1	- Brainstorming Self-Learning	Midterm Exam Final exam
1.4	Applying the derivative of a function for	1	- Brainstor	Midterm Exam

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	studying extrema, increasing, decreasing, concavity of functions, and the equation of tangent line.		ming Self-Learning	Final exam
2.0	**Skills**			
2.1				
2.2				
3.0	**Values, autonomy, and responsibility**			
3.1				
3.2				

C. Course Content

No	List of Topics	Contact Hours
1.	**Limits and Continuity**	**2**
2.	Definition of Limits	**2**
3.	Limits Laws	**2**
4.	Limits Involving Infinity	**2**
5.	Continuity of Functions	**3**
6.	**The Derivative**	**2**
7.	The Limit definition of derivative & the Tangent Line Problem	**3**
8.	Differentiation Rules	**3**
9.	Derivative of Trigonometric Functions	**3**
10.	The Chain Rule	**3**
11.	Implicit Differentiation	**3**
12.	Derivative of Logarithmic and Exponential Functions	**3**
13.	Higher order derivatives	**3**
14.	Implicit Differentiation with Logarithmic and Exponential Functions	**3**
15.	Extreme of Functions	**3**
16.	**Increasing and decreasing function**	**3**
17.	Concavity	**2**
Total		0

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assessment	$7th$ -$8th$	20
2.	midterm exam	During classes	30
3.	Final Exam	At the end of the semester as determined by the academic calendar	50
Total			**100**

*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	I. Alolyan, N. Bin Turki, T. Ghazal, O. Al-Gahtani and K. khashan. **Differential Calculus**, 4th Edition, King Saud University Press.
Supportive References	• George Thomas, Joel Hass, Maurice D. Weir, **Thomas' Calculus**, 2014, 13th edition, Pearson Education. • Howard Anton**, Calculus**, 2009, 9th edition, JOHN WILEY & SONS, INC. • Salas, **Calculus: One and Several Variables, 2007**, 10th edition, JOHN WILEY & SONS, INC. J. Stewart, L. Redlin, Saleem Watson, **Precalculus: Mathematics for Calculus**, Cengage Learning; 7th edition (January 1, 2015)
Electronic Materials	https://www.ck12.org/book/CK-12-Calculus-Concepts/section/1.7/ https://zr9558.files.wordpress.com/2013/10/thomas_calculus.pdf
Other Learning Materials	**None**

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room for maximum 20 students
Technology equipment (projector, smart board, software)	Projector
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Peer reviewer	The peer reviewer will monitor the teaching method of teacher during class and assessed him by filling the peer reviewer assessment form.
Effectiveness of Students assessment	Students	Students evaluate the course instructor through survey form.
Quality of learning resources	Students	A questionnaire is given to the students for feedback of syllabus.
The extent to which CLOs have been achieved	Teaching staff	Software program or Excel sheet
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	14470730-1471-00010
DATE	16/1/2026

توصيف المقرر الدراسي

(بكالوريوس)

اسم المقرر: مهارات الحياة الجامعية
رمز المقرر: 151-مهر-2
البرنامج: هندسة الميكاترونكس والروبوتات
القسم العلمي: الهندسة الكهربائية
الكلية: الهندسة
المؤسسة: جامعة نجران
نسخة التوصيف: 1
تاريخ آخر مراجعة: 26/1/2026

جدول المحتويات

أ. معلومات عامة عن المقرر الدراسي: 3
ب. نواتج التعلم للمقرر واستراتيجيات تدريسها وطرق تقييمها: 4
ج. موضوعات المقرر 5
د. أنشطة تقييم الطلبة 5
ه. مصادر التعلم والمرافق: 5
و. تقويم جودة المقرر: 6
ز. اعتماد التوصيف: 6

أ. معلومات عامة عن المقرر الدراسي:

1. التعريف بالمقرر الدراسي

1. الساعات المعتمدة: 2(2,0,0)

2. نوع المقرر

أ-	☒ متطلب جامعة	☐ متطلب كلية	☐ متطلب تخصص	☐ متطلب مسار	☐ أخرى
ب-	☒ إجباري	☐ اختياري			

3. السنة / المستوى الذي يقدم فيه المقرر: (2/1)

4. الوصف العام للمقرر

يتضمن المقرر أربع وحدات الأولى مهارات التعلم والتكيف الجامعي ويشتمل على أربع موضوعات وهي مهارات التكيف مع الحياة الجامعية ومهارات الاستذكار الفعال ومهارات معالجة المعلومات وأدوات التعلم ومهارات إدارة الاختبار) والوحدة الثانية تتناول مهارات البحث العلمي ويشتمل على ثلاث موضوعات البحث العلمي (أدواته وأخلاقياته ومجالات البحث عن المعلومات من مصادرها وعناصر البحث العلمي وفنيات كتاباتها والوحدة الثالثة تتناول مهارات الاتصال وتشتمل على ثلاث موضوعات هي (مهارات اكتشاف الذات وإدارتها ومهارات التخطيط للمستقبل ومهارات العرض والتقديم والوحدة الرابعة تتناول مهارات التفكير وتشتمل على ثلاث موضوعات (مهارات التفكير الايجابي والتفكير الناقد ومهارات التفكير الإبداعي ومهارات تنويع التفكير واتخاذ القرار).

5- المتطلبات السابقة لهذا المقرر (إن وجدت)

لا يوجد

6- المتطلبات المتزامنة مع هذا المقرر (إن وجدت)

لا يوجد

7. الهدف الرئيس للمقرر

تنمية المهارات الجامعية لدى الطلاب ومساعدتهم على تطبيق تلك المهارات في حياتهم الجامعية والعملية.

2. نمط التعليم (اختر كل ما ينطبق)

م	نمط التعليم	عدد الساعات التدريسية	النسبة
1	تعليم التقليدي	30	100
2	التعليم الإلكتروني	0	0
3	التعليم المدمج • التعليم التقليدي • التعليم الإلكتروني	0	0
4	التعليم عن بعد	0	0

3. الساعات التدريسية (على مستوى الفصل الدراسي)

م	النشاط	ساعات التعلم
1	محاضرات	30
2	معمل أو إستوديو	0
3	ميداني	0
4	دروس إضافية	0
5	أخرى	0
	الإجمالي	30

ب. نواتج التعلم للمقرر واستراتيجيات تدريسها وطرق تقييمها:

الرمز	نواتج التعلم	رمز ناتج التعلم المرتبط بالبرنامج	استراتيجيات التدريس	طرق التقييم
1.0	المعرفة والفهم			
1.1	أن يذكر الطالب المعارف الخاصة بمهارات الحياة الجامعية	7	المناقشة والتعلم التعاوني والعصف الذهني	الاختبار
2.0	المهارات			
2.1	أن يستخدم مهارات التعلم والتكيف الجامعي	3	المناقشة والتعلم التعاوني والعصف الذهني	الاختبار
2.2	أن يطبق مهارات البحث العلمي	3	المناقشة والتعلم التعاوني والعصف الذهني	الاختبار
2.3	أن يستخدم مهارات الاتصال بفعالية	3	المناقشة والتعلم التعاوني والعصف الذهني	الاختبار
2.4	أن يستخدم بعض مهارات التفكير	3	المناقشة والتعلم التعاوني والعصف الذهني	الاختبار

الرمز	نواتج التعلم	رمز ناتج التعلم المرتبط بالبرنامج	استراتيجيات التدريس	طرق التقييم
3.0	القيم والاستقلالية والمسؤولية			
3.1	القيم والاستقلالية والمسؤولية	4	المناقشة والتعلم التعاوني والعصف الذهني	الاختبار
3.2	يتمسك بالتفكير السليم في جميع المواقف التي تواجه	4	المناقشة والتعلم التعاوني والعصف الذهني	الاختبار
3.3	يقدر أهمية البحث العلمي في حل المشكلات	4	المناقشة والتعلم التعاوني والعصف الذهني	الاختبار
3.4	يتواصل مع الآخرين وفق مهارات وآداب الاتصال	4	المناقشة والتعلم التعاوني والعصف الذهني	الاختبار

ج. موضوعات المقرر

م	قائمة الموضوعات	الساعات التدريسية المتوقعة
2	مهارات التكيف مع الحياة الجامعية	2
4	مهارات الاستذكار الفعال	2
6	مهارات معالجة المعلومات وأدوات التعلم	2
8	مهارات إدارة الاختبار	2
10	البحث العلمي (أدواته وأخلاقياته)	2
12	مجالات البحث عن المعلومات من مصادرها	2
14	عناصر البحث العلمي وفنيات كتاباتها	2
16	مهارات اكتشاف الذات وإدارتها	2
17	مهارات التخطيط للمستقبل	2
18	مهارات العرض والتقديم	2

20	مهارات التفكير الايجابي والتفكير الناقد	2
22	مهارات التفكير الإبداعي	2
24	مهارات تنويع التفكير واتخاذ القرار	2
	المجموع	30

د. أنشطة تقييم الطلبة

م	أنشطة التقييم	توقيت التقييم (بالأسبوع)	النسبة من إجمالي درجة التقييم
1	الاختبار الفصلي	الأسبوع السادس	30
2	الواجبات/الاختبارات القصيرة	كل اسبوع	20
3	الاختبار النهائي	نهاية الفصل الدراسي	50

أنشطة التقييم (اختبار تحريري، شفهي، عرض تقديمي، مشروع جماعي، ورقة عمل وغيره).

ه. مصادر التعلم والمرافق:

1. قائمة المراجع ومصادر التعلم:

المرجع الرئيس للمقرر	هنداوي، إبراهيم خضر ، محمد (٢٠١٩) مهارات الحياة الجامعية. الدمام: مكتبة المتنبي.
المراجع المساندة	1. الأميري ، أحمد .) (٢٠٠٥) . فن التفكير الرياض : العبيكان ٢. محمد حسين جودي . (٢٠١٣) نمو التفكير الابداعي للطلاب القاهرة : مركز الكتاب الأكاديمي . عبد الجبار سعيد حسين (٢٠١٦) . مبادىء البحث العلمي القاهرة : دار المناهج للنشر . أنور رياض عبد الرحيم (٢٠٠٨) مهارات التعلم والاستذكار . عمان : دار الثقافة للنشر والتوزيع ه . نهى أبو جمعة (٢٠١٥). مدخل إلى برنامج سكامبر لتنمية التفكير الأبداعي . عمان: مركز ديبونو لتعليم التفكير
المصادر الإلكترونية	
أخرى	

2. المرافق والتجهيزات المطلوبة:

العناصر	متطلبات المقرر
المرافق النوعية (القاعات الدراسية، المختبرات، قاعات العرض، قاعات المحاكاة ... إلخ)	قاعة دراسية 30-35 طالب على الأكثر
التجهيزات التقنية (جهاز عرض البيانات، السبورة الذكية،	بروجكتر

العناصر	متطلبات المقرر
البرمجيات)	
تجهيزات أخرى (تبعاً لطبيعة التخصص)	

و. تقويم جودة المقرر:

مجالات التقويم	المقيمون	طرق التقييم
فاعلية التدريس	المراجعون النظراء	سيقوم المراجع بمراقبة أسلوب التدريس للمعلم أثناء الحصة وتقييمه من خلال ملء نموذج تقييم المراجع.
فاعلية طرق تقييم الطلاب	الطلاب	يقوم الطلاب بتقييم مدرس المادة من خلال نموذج الاستبيان.
مصادر التعلم	الطلاب	يتم إعطاء استبانة للطلاب للحصول على ملاحظات حول المنهج.
مدى تحصيل مخرجات التعلم للمقرر	أعضاء هيئة التدريس	برنامج حاسوبي أو ورقة Excel
أخرى		

المقيمون (الطلبة، أعضاء هيئة التدريس، قيادات البرنامج، المراجع النظير، أخرى (يتم تحديدها).
طرق التقييم (مباشر وغير مباشر).

ز. اعتماد التوصيف:

جهة الاعتماد	**مجلس قسم الهندسة الكهربائية**
رقم الجلسة	**14470730-1471-00010**
تاريخ الجلسة	**16/1/2026**

Course Specification
(Bachelor)

Course Title:	General Chemistry
Course Code:	101-CHM-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	Version 1
Last Revision Date:	26/1/2026

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F. Assessment of Course Quality 6
G. Specification Approval 6

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (3,0,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☒ College	☐ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (3rd/2nd)					
4. Course General Description:					
Stoichiometry Chemical Arithmetic. Gaseous state - The liquid state – Solutions - properties of the combined solutions - Chemical equilibrium - Introduction to organic chemistry: History of organic chemistry, Chemistry of carbons, homologs series, functional groups, Hydrocarbons.					
5. Pre-requirements for this course (if any)**:**					
NA					
6. Co-requisites for this course (if any)**:**					
NA					
7. Course Main Objective(s):					
1. To introduce fundamental concepts of chemistry, including stoichiometry, states of matter, and chemical equilibrium. 2. To explore the basics of organic chemistry, including hydrocarbons, functional groups, and homologous series.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours

1.	**Lectures**	45
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		45

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Understand the concepts and the basic principles of chemistry and its importance in many different fields.	**7**	Lecture	Mid Exam Final Exam
1.2	Understand the different states of matter and properties of the substance in the gas, liquid and solid state.	**7**	Lecture	Mid Exam Final Exam
1.3	Show knowledge and understanding of the use of gas laws to calculate the pressure, volume, density and diffusion speed.	**7**	Lecture	Mid Exam Final Exam
1.4	Show understanding and knowledge of the types of solutions and methods of expressing concentration, and the law of chemical equilibrium.	**7**	Lecture	Final Exam
1.5	Understand the basics of organic chemistry and recognize its importance in life.	**7**	Lecture	Final Exam
2.0	**Skills**			
2.1				
2.2				
3.0	**Values, autonomy, and responsibility**			
3.1				
3.2				

C. Course Content

No	List of Topics	Contact Hours
1.	Stoichiometry Chemical Arithmetic	**10**

2.	Gaseous state - The liquid state – Solutions	**10**
3.	properties of the combined solutions - Chemical equilibrium	**10**
4.	Introduction to organic chemistry: History of organic chemistry, Chemistry of carbons	**10**
5.	Homologs series, functional groups, Hydrocarbons	**5**
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Test 1	Week 6	20
2.	Test 2	Week 12	20
3.	Assignments/Quizzes	Every chapter	10
4.	Final Exam	At the end of the semester as determined by the academic calendar	50
Total			**100**

*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	General Chemistry, Principles and structures " by j . Bardy, 1990
Supportive References	NA
Electronic Materials	NA
Other Learning Materials	NA

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room for maximum 20 students
Technology equipment (projector, smart board, software)	projector
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Peer reviewer	The peer reviewer will monitor the teaching method of the teacher during class and assess him by filling in the peer reviewer assessment form.
Effectiveness of Students' assessment	Students	Students evaluate the course instructor through a survey form.
Quality of learning resources	Students	A questionnaire is given to the students for feedback on syllabus.
The extent to which CLOs have been achieved	Teaching staff	Software program or Excel sheet
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	14470730-1471-00010
DATE	16/1/2026

2024
TP-153

توصيف المقرر الدراسي

(بكالوريوس)

اسم المقرر: المهارات الرقمية - Digital Skills
رمز المقرر: 101-نال-2
البرنامج: هندسة الميكاترونكس والروبوتات
القسم العلمي: الهندسة الكهربائية
الكلية: كلية الهندسة
المؤسسة: نجران
نسخة التوصيف: 1
تاريخ آخر مراجعة: 26/1/2026

جدول المحتويات

أ. معلومات عامة عن المقرر الدراسي: 3
ب. نواتج التعلم للمقرر واستراتيجيات تدريسها وطرق تقييمها: 4
ج. موضوعات المقرر 5
د. أنشطة تقييم الطلبة 5
ه. مصادر التعلم والمرافق: 5
و. تقويم جودة المقرر: 6
ز. اعتماد التوصيف: 6

أ. معلومات عامة عن المقرر الدراسي:

1. التعريف بالمقرر الدراسي

1. الساعات المعتمدة: 2(2,0,0)

2. نوع المقرر

أ -	☒ متطلب جامعة	☐ متطلب كلية	☐ متطلب تخصص	☐ متطلب مسار	☐ أخرى
ب -	☒ إجباري	☐ اختياري			

3. السنة / المستوى الذي يقدم فيه المقرر: (2/3)

4. الوصف العام للمقرر

التقدم التقني له تأثير عميق في جميع مناحي الحياة. على الصعيد العالمي، من الأهمية بمكان تطوير قادة الجيل القادم حتى يكونوا على دراية جيدة بأحدث الاتجاهات الرقمية ومجهزين بفهم ثري لتطبيقاتهم في قطاعات الصناعة المختلفة بالإضافة إلى فوائدهم المجتمعية والتحديات المحتملة. يتناول هذا المقرر مجموعة من القدرات والكفاءات اللازمة لاستخدام الأجهزة في تطبيقات رقمية، من أجل الوصول إلى المعلومات وإدارتها بشكل مثالي، وإنشاء محتوى رقمي ومشاركته بشكل فعال، والتواصل والتعاون مع الآخرين لحل المشكلات المختلفة.

5- المتطلبات السابقة لهذا المقرر (إن وجدت)

لا يوجد

6- المتطلبات المتزامنة مع هذا المقرر (إن وجدت)

لا يوجد

7. الهدف الرئيس للمقرر

الهدف الرئيسي من هذ المقرر متعددة التخصصات هو تزويد الطلاب بفهم نقدي للمهارات الرقمية في التقنيات الرقمية الناشئة وتأثيرها على الأفراد والأعمال والمجتمع.

2. نمط التعليم (اختر كل ما ينطبق)

م	نمط التعليم	عدد الساعات التدريسية	النسبة
1	تعليم التقليدي	0	0
2	التعليم الإلكتروني	0	0
3	التعليم المدمج • التعليم التقليدي • التعليم الإلكتروني	30	100
4	التعليم عن بعد	0	0

3. الساعات التدريسية (على مستوى الفصل الدراسي)

م	النشاط	ساعات التعلم
1	محاضرات	30
2	معمل أو إستوديو	0
3	ميداني	0
4	دروس إضافية	0
5	أخرى	0
	الإجمالي	30

ب. نواتج التعلم للمقرر واستراتيجيات تدريسها وطرق تقييمها:

الرمز	نواتج التعلم	رمز ناتج التعلم المرتبط بالبرنامج	استراتيجيات التدريس	طرق التقييم
1.0	المعرفة والفهم			
1.1	فهم أحدث التقنيات الرقمية وما يقابلها من اتجاهات وتطبيقات وتأثيرات تحولية	1	- حوار ومناقشة - التعلم التعاوني والمناقشة الجماعية - العروض التقديمية	- تقييم أداء الاختبار -تقييم المشاركة في المناقشة والتكليفات والمشاريع
1.2				
2.0	المهارات			
2.1	تحليل أحدث التقنيات الرقمية وما يقابلها من اتجاهات وتطبيقات وتأثيرات تحولية	7	- التدريس القائم على المشروع -التعلم التعاوني - حوار ومناقشة -عروض تقديمية	- تقييم أداء الاختبار -تقييم المشاركة في المناقشة والتكليفات والمشاريع
2.2	شرح كيف يقوم أصحاب المصلحة المختلفون بتقييم الأثر الاقتصادي والبيئي والاجتماعي للتقنيات الرقمية.	7	- التدريس القائم على المشروع -التعلم التعاوني - حوار ومناقشة -عروض تقديمية	- تقييم أداء الاختبار -تقييم المشاركة في المناقشة والتكليفات والمشاريع
2.3	تقييم فرص التحولات التي تدعمها التكنولوجيا على المستويات الفردية والتجارية والمجتمعية.	7	- التدريس القائم على المشروع -التعلم التعاوني - حوار ومناقشة -عروض تقديمية	- تقييم أداء الاختبار -تقييم المشاركة في المناقشة والتكليفات والمشاريع
2.4	الجمع بين التقنيات لتخطيط التحولات القائمة على التكنولوجيا.	7	- التدريس القائم على المشروع -التعلم التعاوني - حوار ومناقشة -عروض تقديمية	- تقييم أداء الاختبار -تقييم المشاركة في المناقشة والتكليفات والمشاريع

الرمز	نواتج التعلم	رمز ناتج التعلم المرتبط بالبرنامج	استراتيجيات التدريس	طرق التقييم
3.0	القيم والاستقلالية والمسؤولية			
3.1	تطوير الحجج السليمة لنشر التقنيات الرقمية الجديدة.	4	- التدريس القائم على المشروع -التعلم التعاوني - حوار ومناقشة -عروض تقديمية	- تقييم أداء الاختبار -تقييم المشاركة في المناقشة والتكليفات والمشاريع

ج. موضوعات المقرر

م	قائمة الموضوعات	الساعات التدريسية المتوقعة
1	مقدمة حول التقنيات الناشئة	2
2	المهارات الرقمية: المشهد التحولي	2
3	الذهنية الرقمية وممارسات الابتكار التقني	2
4	عقلية البيانات: التعلم والتواصل مع البيانات	2
5	الذكاء الاصطناعي	2
6	تعلم الآلة وتطبيقاتها	2
7	التعلم العميق	2
8	انترنت الأشياء	2
9	تقنيات الجيل الخامس	2
10	الأمن السيبراني	2
11	تقنيات الواقع المعزز والافتراضي	2
12	التصنيع التجميعي للتقنيات الناشئة والحديثة	2
13	الكتل العشوائية وتقنية دفتر الحساب الموزع	2
14	الروبوتات	2
15	الطائرات بدون طيار والمركبات ذاتية القيادة	2
16	الخلاصة وعرض مشاريع الطلبة	2
	المجموع	32

د. أنشطة تقييم الطلبة

م	أنشطة التقييم	توقيت التقييم (بالأسبوع)	النسبة من إجمالي درجة التقييم
1	المشاركة والمناقشة	خلال الفصل الدراسي	15
2	الاختبار الفصلي	منتصف الفصل الدراسي	20
3	مشروع مصغر مع العرض	أخر أسبوع في الفصل الدراسي	15
4	الاختبار النهائي	نهاية الفصل الدراسي	50

أنشطة التقييم (اختبار تحريري، شفهي، عرض تقديمي، مشروع جماعي، ورقة عمل وغيره)

ه. مصادر التعلم والمرافق:

1. قائمة المراجع ومصادر التعلم:

المرجع الرئيس للمقرر	المقرر التقني 101: برنامج سفير المستقبل. جامعة ستانفورد (2022) بالتنسيق مع الدكتور يوسف عسيري yasiri@nu.edu.sa
المراجع المساندة	Marr, Bernard. Tech Trends in Practice: The 25 Technologies that are Driving the 4th Industrial Revolution. John Wiley & Sons, 2020. Küfeoğlu, Sinan. "Emerging Technologies: Value Creation for Sustainable Development." (2022).
المصادر الإلكترونية	لا يوجد
أخرى	لا يوجد

2. المرافق والتجهيزات المطلوبة:

العناصر	متطلبات المقرر
المرافق النوعية (القاعات الدراسية، المختبرات، قاعات العرض، قاعات المحاكاة ... إلخ)	قاعات دراسية، فصول افتراضية - بلاكبورد
التجهيزات التقنية (جهاز عرض البيانات، السبورة الذكية، البرمجيات)	لا يوجد
تجهيزات أخرى (تبعاً لطبيعة التخصص)	لا يوجد

و. تقويم جودة المقرر:

مجالات التقويم	المقيمون	طرق التقييم
فاعلية التدريس	قيادات البرنامج، المراجع النظير	مباشر وغير مباشر
فاعلية طرق تقييم الطلاب	الطلبة، أعضاء هيئة التدريس	مباشر وغير مباشر
مصادر التعلم	الطلبة، أعضاء هيئة التدريس	مباشر وغير مباشر
مدى تحصيل مخرجات التعلم للمقرر	الطلبة، أعضاء هيئة التدريس	مباشر وغير مباشر
أخرى		

المقيمون (الطلبة، أعضاء هيئة التدريس، قيادات البرنامج، المراجع النظير، أخرى (يتم تحديدها).
طرق التقييم (مباشر وغير مباشر).

ز. اعتماد التوصيف:

جهة	**مجلس قسم الهندسة الكهربائية**

الاعتماد	
رقم الجلسة	14470730-1471-00010
تاريخ الجلسة	16/1/2026

Course Specification
(Bachelor)

Course Title:	Statics
Course Code:	101-GEC-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	Version 1
Last Revision Date:	26/1/2026

Table of Contents

A. General information about the course: 3
B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods 4
C. Course Content 4
D. Students Assessment Activities 5
E. Learning Resources and Facilities 5
F. Assessment of Course Quality 5
G. Specification Approval 6

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (3,0,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (3rd/2nd)					
4. Course General Description:					
Forces and moments for planar systems; Basic equilibrium conditions; Centroids; Friction; Area and mass moments of inertia; Kinematics of a particle: rectilinear and curvilinear motion;					
5. Pre-requirements for this course (if any)**:**					
NA					
6. Co-requisites for this course (if any)**:**					
NA					
7. Course Main Objective(s):					
1. Solve problems related to forces and moments for planar systems. 2. Analyze basic equilibrium conditions. 3. Analyze the kinematics of a particle					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	0
3.	**Field**	0

4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		45

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Identify problems dealing with forces in a plane or in space and equivalent force systems	**7**	Lectures Tutorials Assignments	Homework Assignment Quizzes Final exam
1.2	Recognize truss, beam, frame and cable problems and understand distributed force systems.	**7**	Lectures Tutorials Assignments	Homework Assignment Quizzes Final exam
1.3	Solve friction problems and determine moments of Inertia and centroid using integration methods.	**1**	Lectures Tutorials Assignments	Homework Assignment Quizzes Final exam
	Analyze three-dimension force and moment problems and how to use vector terminology for moment of inertia, force, work, and energy.	**1**	Lectures Tutorials Assignments	Homework Assignment Quizzes Final exam
2.0	**Skills**			
2.1				
2.2				
2.3				
2.4				
3.0	**Values, autonomy, and responsibility**			
3.1				
3.2				
3.3				

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to engineering mechanics	4

2.	Forces and moments for planar systems	4
3.	Basic equilibrium conditions; Centroids; Friction; Area and mass moments of inertia	4
4.	Kinematics of a particle: rectilinear and curvilinear motion.	8
5.	Kinetics and Kinematics of particles and rigid body.	8
6.	Newton's law, work and energy.	6
7.	Relative velocity and acceleration; translation, fixed axis rotation, general motion.	6
8.	Work and energy.	5
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Test 1	Week 6	20
2.	Test 2	Week 12	20
3.	Assignments/Quizzes	Every chapter	10
4.	Final Exam	At the end of the semester as determined by the academic calendar	50
Total			**100**

*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	Engineering Mechanics: Statics, 15th edition, Published by Pearson (July 6, 2021) © 2022
Supportive References	Engineering Mechanics: Dyamics, Meriam, JL, and Kraige, LG, 7th Ed., Wiley, 2012.
Electronic Materials	NA
Other Learning Materials	NA

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms,	Lecture room for maximum 20 students

Items	Resources
simulation rooms, etc.)	
Technology equipment (projector, smart board, software)	Projector
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Peer reviewer	The peer reviewer will monitor the teaching method of the teacher during class and assess him by filling in the peer reviewer assessment form.
Effectiveness of Students' assessment	Students	Students evaluate the course instructor through a survey form.
Quality of learning resources	Students	A questionnaire is given to the students for feedback on syllabus.
The extent to which CLOs have been achieved	Teaching staff	Software program or Excel sheet
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)
Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

توصيف المقرر الدراسي

(بكالوريوس)

اسم المقرر: الهوية الوطنية National Identity -
رمز المقرر: NAT-2-102
البرنامج: هندسة الميكاترونكس والروبوتات
القسم العلمي: الهندسة الكهربائية
الكلية: كلية الهندسة
المؤسسة: نجران
نسخة التوصيف: 1
تاريخ آخر مراجعة: 26/1/2026

جدول المحتويات

أ. معلومات عامة عن المقرر الدراسي: 3
ب. نواتج التعلم للمقرر واستراتيجيات تدريسها وطرق تقييمها: 4
ج. موضوعات المقرر 5
د. أنشطة تقييم الطلبة 5
ه. مصادر التعلم والمرافق: 5
و. تقويم جودة المقرر: 6
ز. اعتماد التوصيف: 6

أ. معلومات عامة عن المقرر الدراسي:

1. التعريف بالمقرر الدراسي

1. الساعات المعتمدة: 2

2. نوع المقرر

أ -	☒ متطلب جامعة	☐ متطلب كلية	☐ متطلب تخصص	☐ متطلب مسار	☐ أخرى
ب -	☒ إجباري	☐ اختياري			

3. السنة / المستوى الذي يقدم فيه المقرر: (32/)

4. الوصف العام للمقرر

يتناول هذا المقرر مفهوم الهوية الوطنية ومكوناتها ومحدداتها وسماتها وخصائصها، وتطورها عبر مختلف الحقب التاريخية. ويركز على دور ملوك المملكة العربية السعودية منذ عهد الملك المؤسس عبد العزيز ومؤسسات الدولة الكبرى في صياغة الهوية الوطنية السعودية. كما يركز على القيم الرئيسة التي تسهم في الحفاظ على الهوية الوطنية، مثل ثقافة الحوار، وماهية التسامح، وقواعد التعامل مع الآخر.

5- المتطلبات السابقة لهذا المقرر (إن وجدت)

لا يوجد

6- المتطلبات المتزامنة مع هذا المقرر (إن وجدت)

لا يوجد

7. الهدف الرئيس للمقرر

التعرف على الهوية الوطنية وتطورها التاريخي وروافدها ومحدداتها وخصائصها ومواكبتها لمتطلبات العصر وسبل ترسيخها في الأجيال الجديدة.

2. نمط التعليم (اختر كل ما ينطبق)

م	نمط التعليم	عدد الساعات التدريسية	النسبة
1	تعليم التقليدي	30	100
2	التعليم الإلكتروني	0	0
3	التعليم المدمج • التعليم التقليدي • التعليم الإلكتروني	0	0
4	التعليم عن بعد	0	0

3. الساعات التدريسية (على مستوى الفصل الدراسي)

م	النشاط	ساعات التعلم

1	محاضرات	30
2	معمل أو إستوديو	0
3	ميداني	0
4	دروس إضافية	0
5	أخرى	0
	الإجمالي	30

ب. نواتج التعلم للمقرر واستراتيجيات تدريسها وطرق تقييمها:

الرمز	نواتج التعلم	رمز ناتج التعلم المرتبط بالبرنامج	استراتيجيات التدريس	طرق التقييم
1.0	المعرفة والفهم			
1.1	**يتعرف على مكونات الهوية الوطنية**	7	المحاضرة - الحوار	الاختبارات - الواجبات
1.2	**يحدد دور ملوك البلاد ومؤسساتها الحكومية بلورة الهوية السعودية**	7	المحاضرة - المناقشة	الاختبارات - الواجبات
1.3	**يحدد خصائص وسمات الهوية الوطنية**	7	الحوار - المناقشة	الاختبارات
2.0	المهارات			
2.1	**يعد عرضاً تقديمياً عن أحد مظاهر التنمية الحديثة في منطقة نجران**	3	عرض تقديمي	التكليفات
2.2	**يميز مكونات الهوية الوطنية**	3	المحاضرة - المناقشة	الاختبارات
3.2	**يستخدم التقنية في رصد أبرز قواعد الحوار وأنواعه ونماذجه.**	3	التعلم التعاوني	التكليفات
3.0	القيم والاستقلالية والمسؤولية			
3.1	**يظهر روح التعاون مع الآخرين في الأنشطة الجماعية.**	4	التعليم التعاوني	التكليفات

ج. موضوعات المقرر

م	قائمة الموضوعات	الساعات التدريسية المتوقعة
1	**مفهوم الهوية، وعلاقته بالأرض، والخلفية الدينية، والحضارية.**	2
2	**المواطنة: مفهومها، عناصرها الأساسية، أنواعها.**	2
3	**المواطنة: واجباتها، علاقتها بالهوية الوطنية.**	2
4	**مكونات الهوية الوطنية: الوطن، الإسلام، اللغة، الثقافة**	2
5	**العوامل المؤثرة في الهوية الوطنية: الدين - البيئة – التاريخ.**	2
6	**العوامل المؤثرة في الهوية الوطنية: الجغرافيا – المجتمع – الأخلاق والقيم.**	2
7	**دور ملوك البلاد ومؤسساتها الحكومية في صياغة وتطور الهوية الوطنية السعودية.**	2
8	**خصائص وسمات الهوية الوطنية: الإرث التاريخي، الأصالة والمعاصرة.**	2
9	**خصائص وسمات الهوية الوطنية: التنوع والتعددية، التواصل، وقبول ثقافة الآخر**	2
10	**التعايش: مفهومه، أساسياته، مقوماته، مستوياته، قيمه.**	2
11	**ثقافة الحوار: أهميته، مبادئه، قواعده.**	2
12	**ثقافة الحوار: أنواعه، وسائله وأهدافه.**	2
13	**الآخر: أسس التعامل، قواعد الاحترام وحقوقه.**	2
14	**التسامح: مبادئه، قيمه، نماذجه.**	2
15	**التسامح: قبول التنوع، والآثار السلبية للصراعات.**	2
	المجموع	30

د. أنشطة تقييم الطلبة

م	أنشطة التقييم	توقيت التقييم (بالأسبوع)	النسبة من إجمالي درجة التقييم
1	**اختبار منتصف الفصل**	**10**	**30**
2	**اختبارات قصيرة + تكليفات**	**اسبوعياً**	**20**
3	**اختبار نهائي**	**نهاية الفصل الدراسي**	**50**

أنشطة التقييم (اختبار تحريري، شفهي، عرض تقديمي، مشروع جماعي، ورقة عمل وغيره)

ه. مصادر التعلم والمرافق:

1. قائمة المراجع ومصادر التعلم:

المرجع الرئيس للمقرر	**-مجموعة إصدارات مركز الملك عبدالعزيز للحوار الوطني + برنامج سلام للتواصل الحضاري.**
المراجع المساندة	**- قواعد ومبادئ الحوار الفعال، إعداد: د. محمد بن عبد الله الشويعر & أ. عبد الله بن عمر الصقهان، مركز الملك عبد العزيز للحوار الوطني، الرياض، 1431هـ/ 2010م.** **- ثقافة التسامح: ضرورة أخلاقية واجتماعية وسياسية، د. عبد القادر الشيخلي، مركز الملك عبد العزيز للحوار الوطني، الرياض، ١٤٣٩هـ/٢٠١٧م.** **- التواصل الحضاري بين الهوية الوطنية والمواطنة العالمية، هند سليمان الشيحة، سلام للتواصل الحضاري، الرياض، ط1، 1443هـ/ 2021م.** **- الحوار من أجل التعايش، يوسف بن محمد الهويش، مركز الملك عبدالعزيز للحوار الوطني، الرياض، 1443هـ..**
المصادر الإلكترونية	**- مركز الملك عبد العزيز للحوار الوطني** https://kacnd.org/ **-إصدارات برنامج سلام للتواصل الحضاري** https://salam4cc.org/salam-publications/ **-المكتبة الرقمية السعودية** https://sdl.edu.sa/SDLPortal/Publishers.aspx
أخرى	

2. المرافق والتجهيزات المطلوبة:

العناصر	متطلبات المقرر
المرافق النوعية (القاعات الدراسية، المختبرات، قاعات العرض، قاعات المحاكاة ... إلخ)	**القاعات الدراسية**
التجهيزات التقنية (جهاز عرض البيانات، السبورة الذكية، البرمجيات)	**جهاز عرض بيانات**
تجهيزات أخرى (تبعاً لطبيعة التخصص)	**الإنترنت**

و. تقويم جودة المقرر:

مجالات التقويم	المقيمون	طرق التقييم
فاعلية التدريس	**الطلبة**	**غير مباشر (استبانة)**
فاعلية طرق تقييم الطلاب	**المراجع النظير**	**مباشر**
مصادر التعلم	**الطلبة**	**غير مباشر (استبانة)**
مدى تحصيل مخرجات التعلم للمقرر	**أعضاء هيئة التدريس**	**مباشر (تقرير المقرر)**
أخرى		

المقيمون (الطلبة، أعضاء هيئة التدريس، قيادات البرنامج، المراجع النظير، أخرى (يتم تحديدها).
طرق التقييم (مباشر وغير مباشر).

ز. اعتماد التوصيف:

جهة الاعتماد	**مجلس قسم الهندسة الكهربائية**
رقم الجلسة	**14470730-1471-00010**
تاريخ الجلسة	**16/1/2026**

Course Specification
(Bachelor)

Course Title:	Advanced Physics
Course Code:	105-PHY-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	Version 1
Last Revision Date:	26/1/2026

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C. Course Content 5
D. Students Assessment Activities 6
E. Learning Resources and Facilities 6
F. Assessment of Course Quality 7
G. Specification Approval 7

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (2,1,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☒ College	☐ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (3rd/2nd)					
4. Course General Description:					
To educate core part of Physics, in particular the laws such as Ohm's Law, Kirchhoff's Law, Hook's Law, Laws of Thermodynamics, etc. Introducing this course is basically to motivate the students for the detailed understanding of the mechanisms of atomic and crystal structures of material and their electrical, magnetic, thermal and mechanical behavior. In addition to it, solving the numerical problems and answering the reason-based questions are working as a tool for the brainstorming of the student.					
5. Pre-requirements for this course (if any)**:**					
NA					
6. Co-requisites for this course (if any)**:**					
NA					
7. Course Main Objective(s):					
1. To explain fundamental physics laws and their applications in material properties. 2. To enhance problem-solving and critical thinking skills through numerical and conceptual questions.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	30
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		60

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Upon successful completion of this course, students should be able to ➢ Describe the basics of atomic structure, Crystal structure, Electricity, Magnetism, Thermal and Mechanical properties of materials. State the laws, principles, and relations which have been learned during this course, such as the Laws of thermodynamics, Hook's Law, Ohm's Law, Kirchhoff's Law, Aufbau and Pauli exclusion Principle, and Hund's Rule, etc.	7	Lecture	Mid Exam Final Exam
1.2	Upon successful completion of this course, students should be able to ➢ **Define** the corresponding physical quantities, such as quantum numbers, spectral lines, amorphous and crystalline structure, lattice points, Miller indices, unit crystal, primitive cell, resistivity, conductance, conductivity, mobility, current density, magnetic field, paramagnetic, diamagnetism,	7	Lecture	Mid Exam Final Exam

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	ferromagnetism, thermal energy, latent heat, stress, strain etc. either by means of **memorizing** or by means of **recognize**. **Write** the answers of theoretical as well as numerical problems based on these laws, principles and relations.			
1.3	Upon successful completion of this course student should be able to ➢ **Explain** the mechanism and concepts of laws, principles, and relations of physics. ➢ **Evaluate** and appraise the related practical problems	7	Lecture	Mid Exam Final Exam
1.4				
2.0	**Skills**			
2.1	Develop creative skills by analyzing the phenomena of physics carried out via experiment.	6	Lecture	Mid Exam Final Exam
2.2				
3.0	**Values, autonomy, and responsibility**			
3.1				

C. Course Content

No	List of Topics	Contact Hours
1.	**Theoretical Part** *Atomic Structures; Crystal Structures; Electricity and Electrical Properties of Materials; Magnetism and Magnetic properties of Materials; Thermal Properties of Materials; Mechanical Properties of Materials.*	**40**
2.	**Experimental Part** *Introduction to laboratory work; Measurements of Young's Modulus of a wooden beam; Determination of coefficient of viscosity of fluid; Measurement of the value of unknown resistance using Meter bridge; Determination of inductance using RLC series circuit; Analysis of the current voltage characteristics of a PN junction diode / Zener diode / LED; Determination of spring constant using Simple pendulum via dynamical method; Revision for all experiments*	**20**
Total		**60**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	First midterm exam	7-8	12.5
2.	Lab midterm exam	8-9	5
3.	Second midterm exam	13-14	12.5
4.	Lab Assessment 1 (Notebook Evaluation):	16-18	10
5.	Lab Assessment 2 (Final lab exam.):	16-18	10

*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	Serway, Raymond A., John W. Jewett, and Vahé Peroomian. *Physics for scientists and engineers*. Vol. 2. Philadelphia: Saunders college publishing, 2000.
Supportive References	-
Electronic Materials	http://sciencebooksonline.info/physics.html
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room for maximum 20 students
Technology equipment (projector, smart board, software)	projector
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Peer reviewer	The peer reviewer will monitor the teaching method of teacher during class and assessed him by filling the peer reviewer assessment form.
Effectiveness of Students assessment	Students	Students evaluate the course instructor through survey form.

Assessment Areas/Issues	Assessor	Assessment Methods
Quality of learning resources	Students	A questionnaire is given to the students for feedback of syllabus.
The extent to which CLOs have been achieved	Teaching staff	Software program or Excel sheet
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

Course Specification
(Bachelor)

Course Title:	Introduction to Integral
Course Code:	106-MAT-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	Version 1
Last Revision Date:	26/1/2026

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C. Course Content.....5
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E. Learning Resources and Facilities.....5
1. References and Learning Resources.....5
2. Required Facilities and equipment.....6
F. Assessment of Course Quality.....6
G. Specification Approval.....6

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (3,0,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☒ College	☐ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (3rd/2nd)					
4. Course General Description:					
This course is a 3-credit course. It serves as a continuation of calculus I course. The topics including Riemann Sums, definite and indefinite integrals, fundamental theorem of calculus, Integration techniques, improper integrals, and applications of the definite integrals.					
5. Pre-requirements for this course (if any)**:**					
NA					
6. Co-requisites for this course (if any)**:**					
NA					
7. Course Main Objective(s):					
To introduce the concepts of definite and indefinite integrals, Integration techniques, and some applications of definite integrals					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours

1.	**Lectures**	45
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		45

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Write the definition of indefinite and definite integrals.	7	Lecture discussions	Final Exam
1.2	Define the anit-derivative and the integral of the basic functions.			
1.3	Recognize the different techniques of integration (Substitution rule, integration by parts, trigonometric and hyperbolic substitutions, partial fractions, special substitutions).			
1.4	Calculate the definite integrals using Riemann' sum	1	Lectures discussions	Final Exam
1.5	Evaluate indefinite and definite integrals by different methods of integration.			
1.6	Applying the definite integrals for evaluating the area of plane regions, arc length, and volumes.			
2.0	Skills			
3.0				
3.1				

C. Course Content

No	List of Topics	Contact Hours
1.	Riemann Sums The Definite Integrals	9

	Properties of the Definite Integrals Antiderivatives and the Indefinite Integrals Integration of Basic Functions Mean Value Theorem and the Fundamental Theorem of Calculus.	
2.	Indefinite Integrals and the Substitution Rule Integrals Involving the Trigonometric and Hyperbolic Functions Integral involving the Inverse of Trigonometric and Hyperbolic functions	6
3.	Integration Techniques: Integration by Parts Trigonometric and Hyperbolic Substitutions Integration of Rational Functions by Partial Fractions	12
4.	Integrals involving Quadratic Functions Special Substitutions Integrals involving Power of Trigonometric Functions Improper Integrals	12
5.	Application of the definite integrals: Areas, Volumes, and Arc length	6
Total		0

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Exercises, Homework& Assignments	Open	10
2.	Midterm exam 1	6th Week	20
3.	Midterm exam 2	12th Week	20
4.	Final Exam	16th Week	50
Total			**100**

*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	- George Thomas, Joel Hass, Maurice D. Weir, Thomas' Calculus, 2014, 13th edition, Pearson Education.
Supportive References	- Howard Anton, Calculus, 2009, 9th edition, JOHN WILEY & SONS, INC. - Salas, Calculus: One and Several Variables, 2007, 10th edition, JOHN WILEY & SONS, INC. - E. Swokowski, "Calculus", the classical edition books, Cole Publisher, 1994.
Electronic Materials	None
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom with 30 seats.
Technology equipment (projector, smart board, software)	- Blackboard Platform - Mathematica Program - Projector
Other equipment (depending on the nature of the specialty)	**N/A**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Student	Student Questionnaire (Indirect)
Effectiveness of students' assessment	Peer Reviewer	Rubrics (Indirect)
Quality of learning resources		
The extent to which CLOs have been achieved	Faculty	Direct
Other		

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

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	14470730-1471-00010
DATE	16/1/2026

توصيف المقرر الدراسي

(بكالوريوس)

اسم المقرر: Muslim Culture (1) - ثقافة المسلم (1)
رمز المقرر: 111-ثقف-2
البرنامج: هندسة الميكاترونكس والروبوتات
القسم العلمي: الهندسة الكهربائية
الكلية: كلية الهندسة
المؤسسة: نجران
نسخة التوصيف: 1
تاريخ آخر مراجعة: 26/1/2026

جدول المحتويات

أ. معلومات عامة عن المقرر الدراسي: 3
ب. نواتج التعلم للمقرر واستراتيجيات تدريسها وطرق تقييمها: 4
ج. موضوعات المقرر 5
د. أنشطة تقييم الطلبة 5
ه. مصادر التعلم والمرافق: 5
و. تقويم جودة المقرر: 6
ز. اعتماد التوصيف: 6

أ. معلومات عامة عن المقرر الدراسي:

1. التعريف بالمقرر الدراسي

1. الساعات المعتمدة: 2

2. نوع المقرر

أ-	☒ متطلب جامعة	☐ متطلب كلية	☐ متطلب تخصص	☐ متطلب مسار	☐ أخرى
ب-	☒ إجباري	☐ اختياري			

3. السنة / المستوى الذي يقدم فيه المقرر: (3/2)

4. الوصف العام للمقرر

مدخل يتضمن مفهوم الثقافة الإسلامية وأهدافها وخصائصها وموضوعاتها، والتحديات التي تواجهها.

5- المتطلبات السابقة لهذا المقرر (إن وجدت)

لا يوجد

6- المتطلبات المتزامنة مع هذا المقرر (إن وجدت)

لا يوجد

7. الهدف الرئيس للمقرر

معرفة مفهوم الثقافة الإسلامية بمصادرها وخصائصها وموضوعاتها، وأخلاقها الحسنة، وأهم التحديات التي تواجها.

2. نمط التعليم (اختر كل ما ينطبق)

م	نمط التعليم	عدد الساعات التدريسية	النسبة
1	تعليم التقليدي	30	100
2	التعليم الإلكتروني	0	0
3	التعليم المدمج • التعليم التقليدي • التعليم الإلكتروني	0	0
4	التعليم عن بعد	0	0

3. الساعات التدريسية (على مستوى الفصل الدراسي)

م	النشاط	ساعات التعلم

1	محاضرات	25
2	معمل أو إستوديو	
3	ميداني	
4	دروس إضافية	
5	أخرى استذكار -- الواجبات وأعمال الفصل- استعداد للاختبارات – الاختبارات)	5
	الإجمالي	30

ب. نواتج التعلم للمقرر واستراتيجيات تدريسها وطرق تقييمها:

الرمز	نواتج التعلم	رمز ناتج التعلم المرتبط بالبرنامج	استراتيجيات التدريس	طرق التقييم
1.0	المعرفة والفهم			
1.1	**يعرف مفهوم الثقافة، وأهدافها وخصائصها ومصادرها والفرق بينها وبين غيرها من العلوم.**	7	**المحاضرات الحوار والمناقشة**	**الاختبارات الأسئلة التقويمية الدورية.**
1.2	**يعرف موضوعات الثقافة الإسلامية، والتحديات التي توجهها الثقافة الإسلامية.**	7	**المحاضرات الحوار والمناقشة**	**الاختبارات الأسئلة التقويمية الدورية.**
1.3	**يدرك أركان الإيمان، والعبادات بأنواعها، وتحديات الثقافة الإسلامية.**	7	المحاضرات المناقشة والحوار.	**القيام بالواجبات الإضافية. الأسئلة الشفوية والتحريرية**
1.4	**يفرق بين الأخلاق الحسنة والسيئة.**	7	**الحوار والمناقشة ورش العمل**	**مشاريع وأوراق العمل**
2.0	المهارات			
2.1				
2.2				
3.0	القيم والاستقلالية والمسؤولية			
3.1	يمارس العبادات والأخلاق الحسنة.	4	**لعب أدوار الحوار والمناقشة**	**الأسئلة الشفوية والتحريرية** السلوك والأخلاق
...				

ج. موضوعات المقرر

م	قائمة الموضوعات	الساعات التدريسية المتوقعة
1	**مفهوم الثقافة.** - **تعريف الثقافة.** - **أهداف الثقافة وخصائصها.** - **مصادر الثقافة الإسلامية.** - **الفرق بين الثقافة والعلم والحضارة.** - **نظرة الثقافة الإسلامية إلى الإنسان والكون والحياة.**	4
2	**موضوعات الثقافة الإسلامية:** - **العقائد.** - **أركان الإيمان.**	6
3	**أركان الإسلام: - العبادات المفروضة؛ (الشهادتان – الصلاة - الزكاة - الصوم – الحج)**	5
-4	**.الاختبار النصفي**	1
-5	**العبادات:** - **العبادات القلبية.** - **العبادات القولية.** - **العبادات البدنية.**	5
-6	**الأخلاق** - **الأخلاق، وأهميتها وفائدتها.** - **مظاهر ارتباط الأخلاق بالعقيدة الإسلامية.** - **صور من الأخلاق الحسنة.**	5
-7	**:تحديات الثقافة الإسلامية** - **على المستوى الفكري.** - **على المستوى الأخلاقي.** - **على المستوى الاجتماعي.**	4
المجموع		30

د. أنشطة تقييم الطلبة

م	أنشطة التقييم	توقيت التقييم (بالأسبوع)	النسبة من إجمالي درجة التقييم
1	الاختبار الفصلي	السادس	30
2	التقييم (انشطة وواجبات أو بحوث أو اختبارات قصيرة)	مستمر	20
3	الاختبار النهائي	نهاية الفصل	50

م	أنشطة التقييم	توقيت التقييم (بالأسبوع)	النسبة من إجمالي درجة التقييم
		الدراسي	
	المجموع		**100**

أنشطة التقييم (اختبار تحريري، شفهي، عرض تقديمي، مشروع جماعي، ورقة عمل وغيره)

ه. مصادر التعلم والمرافق:

1. قائمة المراجع ومصادر التعلم:

المرجع الرئيس للمقرر	مذكرة خاصة أعدها قسم الثقافة الإسلامية
المراجع المساندة	1. الثقافة الإسلامية وتحديات العصر: د. شوكت محمد عليان. 2. الثقافة الإسلامية ومدى تأثيرها في الفكر المعاصر: سارة آل سعود. 3. الثقافة الإسلامية، مفهومها، مصادرها، مجالاتها: د. عزمي طه السيد وآخرون. 4. الحضارة: حسين مؤنس. 5. عقيدة المسلمين والرد على الملحدين والمبتدعين: صالح البليهي. 6. العقيدة والمذاهب المعاصرة: عبدالعزيز نداء. 7. إغاثة اللهفان من مصايد الشيطان: ابن قيم الجوزية. 8. الايمان: ابن تيمية. **9.** دلائل النبوة: الإمام البيهقي.
المصادر الإلكترونية	**المكتبة الشاملة** **الجامع لكتب التراث الاسلامي والعربي**
أخرى	**المكتبة**

1. المرافق والتجهيزات المطلوبة:

العناصر	متطلبات المقرر
المرافق النوعية (القاعات الدراسية، المختبرات، قاعات العرض، قاعات المحاكاة ... إلخ)	**القاعات الدراسية -المكتبة**
التجهيزات التقنية (جهاز عرض البيانات، السبورة الذكية، البرمجيات)	**جهاز عرض البيانات -الحاسب الآلي - شبكة الإنترنت**
تجهيزات أخرى (تبعاً لطبيعة التخصص)	**لا يوجد**

و. تقويم جودة المقرر:

مجالات التقويم	المقيمون	طرق التقييم
فاعلية التدريس	إدارة القسم	الزيارة والمتابعة

مجالات التقويم	المقيمون	طرق التقييم
فاعلية طرق تقييم الطلاب	الطلاب – المقوم المستقل	مراجعة الوثائق – التغذية الراجعة
مصادر التعلم	القسم العلمي	الاستبانات
مدى تحصيل مخرجات التعلم للمقرر	إدارة القسم – المقوم المستقل	مراجعة النتائج

المقيمون (الطلبة، أعضاء هيئة التدريس، قيادات البرنامج، المراجع النظير، أخرى (يتم تحديدها).
طرق التقييم (مباشر وغير مباشر).

ز. اعتماد التوصيف:

جهة الاعتماد	مجلس قسم الهندسة الكهربائية
رقم الجلسة	14470730-1471-00010
تاريخ الجلسة	16/1/2026

Course Specification
(Bachelor)

Course Title:	Advanced Calculus
Course Code:	203-MAT-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	1
Last Revision Date:	26/1/2026

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C. Course Content 4
D. Students Assessment Activities 5
E. Learning Resources and Facilities 5
F. Assessment of Course Quality 6
G. Specification Approval 6

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (3,0,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☒ College	☐ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: 4th/2nd					
4. Course General Description:					
This Course will cover the sequences and infinity Series, calculus with multivariate functions and Applications.					
5. Pre-requirements for this course (if any):					
106-MAT-3					
6. Co-requisites for this course (if any):					
NA					
7. Course Main Objective(s):					
The main objective of the course is to determine when a sequences and series converge, understand the relation between the function and its representation by power series by Maclaurin and Taylor series, and familiarize the students with the essential concepts and the solutions of partial derivatives and multiple integrals.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		45

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Define the basic concepts about Convergence of infinite Series, partial Derivatives	7	Lecture Cooperative learning Problem solving Brainstorming Self-Learning	Final exam
1.2	Describe appropriate information for applying partial Derivatives and Multiple integral in various scientific fields.	7		
2.1	Evaluate limits of sequences, know basic limits and determine the limits of some simple recursively defined sequences	1	Lecture Cooperative learning Problem solving Brainstorming Self-Learning	Final exam
2.2	Apply series tests to determine whether a particular series converges or diverges.	1		
2.3	Evaluate the partial derivative of multivariable functions and multiple integral.	1		
2.4	Apply multivariate calculus techniques to calculate the gradients, directional derivatives, arc length of curves, area of surfaces,	1		

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	and volume of solids.			
2.0	Skills			
3.1	Work within groups and independently.	3		
3.0	Values, autonomy, and responsibility			

C. Course Content

No	List of Topics	Contact Hours
1.	Infinite Series, Convergence Tests, Taylor and Maclorian Series	6
2.	Functions of Several Variables, Limits and Continuity, Partial Derivatives, Increments and Differentials, Chain Rules	8
3.	Directional Derivatives, Tangent Planes and Normal Lines, Extrema of Functions of Several Variables, Lagrange Multipliers	8
4.	Double Integrals, Area and Volume, Double Integrals in Polar Coordinates, Surface Area.	8
5.	Triple Integrals, Moments and Center of Mass	8
6.	Integrals in Cylindrical Coordinates, Spherical Coordinates, Change of Variables and lacobians	8
Total		45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm exams	6 & 12	40%
2.	Assignments/Quizzes	During the class	10%
3.	Final exam	16	50%
	Sum		100

*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	George Thomas, Joel Hass, Maurice D. Weir, Thomas' Calculus, 2014, 13th edition, Pearson Education.
Supportive References	- Howard Anton, Calculus, 2009, 9th edition, JOHN WILEY &

	SONS, INC. - Salas, Calculus: One and Several Variables, 2007, 10th edition, JOHN WILEY & SONS, INC. 1. E. Swokowski, "Calculus", the classical edition books, Cole Publisher, 1994.
Electronic Materials	
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room for a maximum of 20 students
Technology equipment (projector, smart board, software)	- Laptops - Data show
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester to identify weaknesses in the course.
Effectiveness of Students assessment	Students	Feedback from Test 1, Test 2, and Final exam records.
Quality of learning resources	Students	A questionnaire is administered at the end of every semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

Course Specification
(Bachelor)

Course Title:	Computer Programming for Engineers
Course Code:	204- GEC-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	1
Last Revision Date:	26/1/2026

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G. Specification Approval 6

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (2,1,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☒ College	☐ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: 4th/2nd					
4. Course General Description:					
Computer Algorithms; Developing Algorithms; Programming Preliminaries; Simple computer Programs; Numeric Constants and Variables; Arithmetic Expressions; Input and Output in C Programs; Conditional statements; Implementing loops in Programs; Defining and Manipulation Arrays; Logical Expressions and More Control statements; C Programs Examples; Functions; Enumerated data Type and stacks; Structures; Pointer Data Type and its Applications; Lists and Trees; Recursion; Bit level Operations and Applications; Files in C; Miscellaneous Features of C.					
5. Pre-requirements for this course (if any)**:**					
101-CIS-2					
6. Co-requisites for this course (if any)**:**					
NA					
7. Course Main Objective(s):					
1. Understand the basic computer programming concepts. 2. Programming some examples with C language.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	30
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		60

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Identify the Basic Structure and syntaxes of Programming languages.	1	Lectures and lab work	Theoretical exams, practical Exams, Quizzes
1.2	Distinguish different data types.	1	Lectures and lab work	Theoretical exams, practical Exams, Quizzes
1.3				
2.0	**Skills**			
2.1	Develop Computer Algorithms.	6	Lectures and lab work	Theoretical exams, practical Exams, Quizzes
2.2	Apply C programming language in solving mathematical, physical and engineering problems.	6	Lectures and lab work	Theoretical exams, practical Exams, Quizzes
2.3				
3.0	**Values, autonomy, and responsibility**			
3.1				
3.2				
3.3				

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to programming languages	4
2.	Input and output in C language.	12
3.	Studying the syntaxes of C language.	8

4.	Sequential, selection and repetitive structures of C language.	14
5.	Arithmetic and mathematical expressions.	8
6.	Functions, arrays and pointer.	14
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm Exam	10	20
2.	Quiz 1	7	5
3.	Quiz 2	12	5
4.	Lab work	Weekly	20
5.	Final exam	At the end of the semester as determined by the academic calendar	50
Sum			**100**

*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	"Computer Programming in C," by V. RAJARAMAN Eastern Economy Edition.
Supportive References	"Problem Solving and Program Design in C," Jeri R. Hanly & Elliot B. Koffman, Seventh Ed., Pearson, 2013 Other supplemental materials "C "How to Program," P. J. Deitel & H. M. Deitel, Sixth Ed., Pearson, 2010
Electronic Materials	http://lib.nu.edu.sa/
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room for a maximum of 20 students
Technology equipment (projector, smart board, software)	- Laptops - Data show
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester to identify weaknesses in the course.
Effectiveness of Students assessment	Students	Feedback from Test 1, Test 2, and Final exam records.
Quality of learning resources	Students	A questionnaire is administered at the end of every semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

Course Specification
(Bachelor)

Course Title:	Differential Equations
Course Code:	204-MAT-3
Program:	Bachelor of Electrical Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	Version 1
Last Revision Date:	1/1/2025

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G. Specification Approval.....6

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (3,0,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☒ College	☐ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (4th/2nd)					
4. Course General Description:					
This course is an introduction to the study of ordinary differential equations. In this course, the definition, classification and different methods of solution are presented. Some physical, engineering, chemical, biological and other applications are also studied.					
5. Pre-requirements for this course (if any)**:**					
106-MAT-3					
6. Co-requisites for this course (if any)**:**					
NA					
7. Course Main Objective(s):					
• Inform the students of certain type of differential equations. • Illustrate the need of differential equations in our practical life. • Training the students for finding the solutions of differential equations.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours

1.	**Lectures**	45
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		45

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Memorize the basic concepts about ordinary differential equations effectively.	7	Lectures	- Exams - Assignments - Quizzes
1.2	Select the solutions of ordinary differential equations in a sequential way.	1	discussions	
	Determine the appropriate method for solving the ordinary differential equations.	1	Lectures Discussions	- Exams - Assignments Quizzes
2.0	Skills			
2.1	Working on a team and individual.	3	Discussions	- Assignments
3.0	Values, autonomy, and responsibility			
3.1				

C. Course Content

No	List of Topics	Contact Hours
1.	Definition of a Diff. Eq, Classification of Diff. Eq. by (type, order, linearity), Interval of definition, Solutions (explicit, implicit), the elimination of arbitrary constants	3
2.	First-order differential equations, solutions and initial value. The existence and uniqueness of solutions, separable Equations, homogeneous equations, exact equations linear equations, special	15

	integrating factor for solving non exact equations, linear equations and Bernoulli's. Application (Growth and Decay, Newton's law of cooling}	
3	Linear differential equations of order 2. General solutions of a homogeneous and non-homogeneous linear equations of differential equations with constants coefficient characteristic equation with different cases, Differential Operators. The method of undetermined coefficients, variation of parameters and inverse operators.	15
4	Definition of Laplace transform, properties of Laplace transform, inverse Laplace transform, solving initial value problem.	6
5	Fourier series, standard formula, periodic functions, even and odd functions, Fourier sins and cosine series.	6
Total		45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Two Midterm exams	**7 & 12**	40%
2.	**Homework** and Assignments/Quizzes	**5**	10%
3.	Final exam	**16**	50%
...			

*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	- Jeffrey R .Chasnov , Introduction to Differential Equatios , The Hong Kong University of Science and Technology , Department of Mathematics, Hong Kong , 2009
Supportive References	- Erank Ayres , Differential Equations , theories and problem , McGraw-Hill , New York, 1990 - Hassan Alowyhdi , Differential Equations (Part I) , Alrushed - 2006.
Electronic Materials	http://www.nu.edu.sa/gui/SubDefault.aspx?PageId=696 http://lib.nu.edu.sa/digitalLibbrary.aspx?PageId=1494 http://lib.nu.edu.sa/SubLibbrary.aspx?PageId=1491 https://twitter.com/math1427?lang=ar http://en.wikipedia.org/wiki/Differential_equation http://mathworld.wolfram.com/OrdinaryDifferentialEquation.html

	http://mathforum.org/differential/differential.html
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	• **Classrooms number of seats = 20 seat Rooms equipped with modern teaching techniques and different display devices**
Technology equipment (projector, smart board, software)	**Data show, Smart Board**
Other equipment (depending on the nature of the specialty)	**No need**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Student	Student Questionnaire (Indirect)
Effectiveness of student's assessment	Peer Reviewer	Rubrics (Indirect)
Quality of learning resources		
The extent to which CLOs have been achieved	Faculty	Direct
Other		

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

G. Specification Approval Data

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	14470730-1471-00010
DATE	16/1/2026

Public - عام

Course Specification
(Bachelor)

Course Title:	Dynamics
Course Code:	205-GEC-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	College of Engineering
Institution:	Najran University
Version:	1.0
Last Revision Date:	07/6/2025

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E. Learning Resources and Facilities.....5

F. Assessment of Course Quality.....5

G. Specification Approval.....6

A. General information about the course:

1. 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: Second Year \ Level 4					
4. Course General Description:					
Basic considerations (Vector operations, Newtonian mechanics), Engineering applications of virtual work, Kinematics of particles, Newton's law, Kinematics of plane rigid bodies, Equations of motion, Work and energy, the principle of impulse and momentum, and vibrations.					
5. Pre-requirements for this course (if any)**:**					
101-GEC-3 (Statics)					
6. Co-requisites for this course (if any)**:**					
NIL					
7. Course Main Objective(s):					
1. To Recognize Position, velocity, and acceleration of particles and rigid bodies in relation to space and time. 2. To understand Kinematics of a particle, including rectilinear and curvilinear. 3. Be familiar with Projectile motion principle and its application. 4. To understand the principles of Newton's Second Law and its applications. 5. To analyze the kinetics of a particle using work and energy method. 6. To apply the principle of linear Impulse and Momentum for a particle. 7. To understand Planar Kinematics of a rigid body.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100%
2	E-learning		

No	Mode of Instruction	Contact Hours	Percentage
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	NIL
3.	**Field**	NIL
4.	**Tutorial**	15
5.	**Others (specify)**	NIL
Total		45

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	**Know the law of motion in one, two and three-dimensional kinematics, law of principle of work and energy, Newton's laws, the types of impact and apply conservation of linear momentum.**	**1**	**Knowledge and understanding TS:1-Interactive lectures using PowerPoint slides with more examples in the class. TS:2- Engaging the students in problem-based learning through examples. TS:3-Recall the topics discussed in the last lecture by**	**Test performance evaluation -Evaluation through individual assignments**

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			asking questions to the students. TS: 4 – Associating the topics in each chapter with the CLO. TS:5 –Discussion with the students in the class hours	
1.2	Test performance evaluation -Evaluation through individual assignments	7	TS:1-Interactive lectures using PowerPoint slides with more examples in the class. TS:2- Engaging the students in problem-based learning through examples. TS:3-Recall the topics discussed in the last lecture by asking questions to the students. TS: 4 – Associating the topics in each chapter with the CLO. TS:5 – Discussion with the students in the class hours	Test performance evaluation -Evaluation through individual assignments
...				
2.0	Skills			
2.1	Thinking through problems solving, reasoning for each problem solved, Remembering equations and	2	TS:1-Interactive lectures using PowerPoint slides with more examples in the class.	●Locally Developed Exams such as Mid & Final Exams with scoring rubrics

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	principles.		**TS:2- Engaging the students in problem-based learning through examples. TS:3-Recall the topics discussed in the last lecture by asking questions to the students. TS: 4 – Associating the topics in each chapter with the CLO. TS:5 –Discussion with the students in the class hours**	**●Assignments involving critical and logical thinking questions**
2.2	**Use the computer for analyzing and processing the examples.**	**6**	**TS:1-Interactive lectures using PowerPoint slides with more examples in the class. TS:2- Engaging the students in problem-based learning through examples. TS:3-Recall the topics discussed in the last lecture by asking questions to the students. TS: 4 – Associating the topics in each chapter with the CLO. TS:5 –Discussion with the students in the class hours**	**● Locally Developed Exams such as Mid & Final Exams with scoring rubrics ●Assignments involving critical and logical thinking questions**

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
...				
3.0	Values, autonomy, and responsibility			

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction and statics review	
2.	Kinematics of Particles: rectilinear, curvilinear and projectile motion	4
3.	Kinetics of a particle: Force and acceleration	7
4.	Kinetics of Particles: Principle of Work and Energy	8
5.	Planar Kinetics of Particles Impulse and Momentum	6
6.	Eccentric Impact	6
7.	Planar Kinematics of a rigid body	8
8.		6
Total		0

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Test 1	Week 6	20 %
2.	Test 2	Week 12	20 %
3.	Assignments/Quizzes/ group project and presentation	Every chapter	10 %
4.	Final Exam	At the end of the semester as determined by the academic calendar	50 %

*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	Engineering Mechanics: Dynamics - 13th Edition - R. C. Hibbeler - Pearson Prentice Hall – 2012- ISBN 13: 978-0132911276
Supportive References	Vector Mechanics for Engineers: Dynamics -10th Edition - F. P. Beer et al. - Mc-Graw Hill - 2013
Electronic Materials	N http://lib.nu.edu.sa/SDL.aspx A
Other Learning Materials	MS Excel, Word and Power point, MatLab,

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Classrooms**
Technology equipment (projector, smart board, software)	**Smart Projector**
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Program Leaders and Peer Reviewer	Direct, Indirect
Effectiveness of Students assessment	Students & Faculty	Direct and Indirect
Quality of learning resources	Students & Faculty	Direct and Indirect
The extent to which CLOs have been achieved	Students & Faculty	Direct and Indirect
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

Course Specification
(Bachelor)

Course Title:	Digital Logic Design
Course Code:	251-ELE-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	1
Last Revision Date:	26/1/2026

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D. Students Assessment Activities 5
E. Learning Resources and Facilities 5
F. Assessment of Course Quality 6
G. Specification Approval 6

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (3,0,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: 4th/2nd					
4. Course General Description:					
Number systems & codes. Logic gates. Boolean algebra. Karnaugh maps. Analysis and synthesis of combinational systems, decoders, multiplexers, adders and subtractors. Types of flip-flops. Sequential circuit analysis and design. VHDL and its application in basic gates.					
5. Pre-requirements for this course (if any):					
NA					
6. Co-requisites for this course (if any):					
NA					
7. Course Main Objective(s):					
The main purpose of this course is to identify how to analyze and design digital systems.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	0

5.	**Others (specify)**	0
Total		45

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Define number systems; decimal, binary, octal and hexadecimal.	1	- Lectures - Tutorials	Mid-term 1 Final Quizzes
1.2				
1.3				
2.0	**Skills**			
2.1	Analyze Boolean algebra and Karnaugh map for logic circuits simplification.	6	- Lectures - Tutorials	Mid-term 1 Final Quizzes
2.2	Analyze combinational logic and sequential logic circuits.	2	- Lectures - Tutorials	Mid-term 2 Final Quizzes
2.3	Design combinational logic and sequential logic circuits.	2	- Lectures - Tutorials	Mid-term 2 Final Quizzes
3.0	**Values, autonomy, and responsibility**			
3.1				
3.2				
3.3				

C. Course Content

No	List of Topics	Contact Hours
1.	Number systems	10
2.	Boolean algebra and logic gates	10
3.	Simplification of Boolean functions	8
4.	Combinational logic circuits design and analysis	4

5.	Digital combinational logic (decoders, encoders, multiplexers, demultiplexers)	4
6.	Digital combinational logic (adders and subtractors)	4
7.	Analysis of sequential circuits	6
8.	Design of sequential circuits.	8
9.	VHDL and its application in basic gates	6
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Test 1	Week 6	**20**
2.	Test 2	Week 12	**20**
3.	Assignments/ Quizzes	Every chapter	**10**
4.	Final Exam	At the end of the semester as determined by the academic calendar	**50**
	Sum		**100**

*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	Morris Mano , "Digital Design", Prentice Hall, Fifth edition, .2015
Supportive References	John F. Wakerly, Digital Design: Principles and Practices Package, 4th edition, Prentice-Hall, 2007.
Electronic Materials	http://lib.nu.edu.sa/
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room for a maximum of 20 students
Technology equipment (projector, smart board, software)	- Laptops - Data show
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester to identify weaknesses in the course.
Effectiveness of Students assessment	Students	Feedback from Test 1, Test 2, and Final exam records.
Quality of learning resources	Students	A questionnaire is administered at the end of every semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

Course Specification
(Bachelor)

Course Title:	Digital Logic Design Lab
Course Code:	252-ELE-1
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	1
Last Revision Date:	26/1/2026

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E. Learning Resources and Facilities 5
F. Assessment of Course Quality 6
G. Specification Approval 6

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
1 (0,1,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: 4th/2nd					
4. Course General Description:					
Number systems & codes. Logic gates. Boolean algebra. Karnaugh maps. Analysis and synthesis of combinational systems, decoders, multiplexers, adders and subtractors. Types of flip-flops. Sequential circuit analysis and design. Simulation of basic gates (OR, NOT) using VHDL.					
5. Pre-requirements for this course (if any)**:**					
NA					
6. Co-requisites for this course (if any)**:**					
Digital Logic Design (210-MRE-3)					
7. Course Main Objective(s):					
The main purpose of this course is to identify how to analyze and design digital systems.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	30	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	0
2.	**Laboratory/Studio**	30
3.	**Field**	0

4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		30

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Define logic circuits laboratory and logic gates.	1	- Pre-lab lectures - Experiment	Exams, Quizzes, Pre-labs and reports
1.2	Select the solutions of ordinary differential equations in a sequential way.	1	**xx**	
1.3	Determine the appropriate method for solving the ordinary differential equations.	1	Lectures Discussions	- Exams - Assignments Quizzes
2.0	**Skills**			
2.1	Analyze basic Boolean function using logic gates	6	- Pre-lab lectures - Experiment	Exams, Quizzes, Pre-labs and reports
2.2	Analyze combinational logic and sequential logic circuits.	6	- Pre-lab lectures - Experiment	Exams, Quizzes, Pre-labs and reports
2.3	Design combinational logic and sequential logic circuits.	2	- Pre-lab lectures - Experiment	Exams, Quizzes, Pre-labs and reports
2.4	Communicate effectively in group discussion and oral examination.	3	- Experiment	Lab Performance and oral examination
3.0	**Values, autonomy, and responsibility**			
3.1	Work effectively as a member of the team.	5	- Experiment	Lab Performance and oral

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
				examination
3.2	Recognize ethical and professional responsibilities in engineering situations and make informed judgments	4	- Experiment	- Reports
3.3				

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction To ETS-8000A	2
2.	Experiment 1: Switch and LED	2
3.	Experiment 2.1: OR Gate; NOT Gate; NOT-OR Gate;	2
4.	Experiment 2.2:NOR Gate; 2-Input NAND Gate 4-Input NAND Gate ;AND-NOR Gate; Staircase Light Control;	2
5.	Experiment 3.1: verifying X+0 =X and X+1=1; verifying X*0 =0 and X*1=X; X+X=X, X+X'=1; X*X=X, X*X'=0; (X*Y)'=X'+Y'; (X+Y)'=X'*Y';	2
6.	Experiment 3.2: 2-Bit Magnitude Comparator; Voting Machine; Display Patterns;	2
7.	Experiment 4.1: Half Adder; Full Adder; Half Subtractor; Full Subtractor	2
8.	Experiment 4.2: 4-Bit Adder; 4-Bit Subtractor; BCD Adder	2
9.	Experiment 5: 8-to-3 Encoder ; 3-to-8 Decoder	2
10.	Experiment 6: Logic Unit; Implementing Logic Function with Multiplexer	2
11.	Experiment 7.1: NAND Gate RS Flip-Flop; NOR Gate RS Flip-Flop	2
12.	Experiment 7.2: JK Flip-Flop; T Flip-Flop; D Flip-Flop	2
13.	Experiment 8.1: Converting JK to D Flip-Flop; Converting JK to T Flip-Flop;	2
14.	Experiment 9: Simulation of basic gates (OR, NOT) using VHDL	4
	Total	**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Reports	Every experiment	10%
2.	Pre-labs	Every experiment	10%
3.	Performance	Every experiment	10%
4.	Mid Term Exam	8	20%
5.	Final Exam	End of the semester	50%
		Sum	**100**

*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	.Morris , "Digital Design", Prentice Hall, Fifth edition, 2015
Supportive References	John F. Wakerly, Digital Design: Principles and Practices Package, 4th edition, Prentice-Hall, 2007.
Electronic Materials	http://lib.nu.edu.sa/
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room for a maximum of 20 students
Technology equipment (projector, smart board, software)	- Laptops - Data show
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester to identify weaknesses in the course.
Effectiveness of Students assessment	Students	Feedback from Test 1, Test 2, and Final exam records.
Quality of learning	Students	A questionnaire is administered at the end of every

Assessment Areas/Issues	Assessor	Assessment Methods
resources		semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

توصيف المقرر الدراسي

(بكالوريوس)

اسم المقرر: ثقافة المسلم 2
رمز المقرر: 212-2 TQF-212-ثقف-2
البرنامج: مقرر عام (إجباري).
القسم العلمي: الثقافة الإسلامية.
الكلية: الشريعة وأصول الدين
المؤسسة: جامعة نجران
نسخة التوصيف: رقم (1)
تاريخ آخر مراجعة: 12/3/1445هـ

جدول المحتويات

أ. معلومات عامة عن المقرر الدراسي: 3
ب. نواتج التعلم للمقرر واستراتيجيات تدريسها وطرق تقييمها: 4
ج. موضوعات المقرر 5
د. أنشطة تقييم الطلبة 5
ه. مصادر التعلم والمرافق: 5
و. تقويم جودة المقرر: 6
ز. اعتماد التوصيف: 6

أ. معلومات عامة عن المقرر الدراسي:

1. التعريف بالمقرر الدراسي

1. الساعات المعتمدة: 2

2. نوع المقرر

أ -	☒ متطلب جامعة	☐ متطلب كلية	☐ متطلب تخصص	☐ متطلب مسار	☐ أخرى
ب -	☒ إجباري	☐ اختياري			

3. السنة / المستوى الذي يقدم فيه المقرر: (2/4)

4. الوصف العام للمقرر

يتضمن المقرر دراسة مجالات الثقافة الإسلامية، من خلال دراسة مفهومها ومصادرها وأسسها ومجالاتها وأثرها، وبيان النظم الإسلامية الرئيسة.

5- المتطلبات السابقة لهذا المقرر (إن وجدت)

لا يوجد

6- المتطلبات المتزامنة مع هذا المقرر (إن وجدت)

لا يوجد

7. الهدف الرئيس للمقرر

1- الهدف الرئيس للمقرر: **معرفة مجالات الثقافة الإسلامية، وأهميتها ومصادرها وأسسها ومجالاتها، وأثرها في معالجة التغيرات، ودراسة بعض القضايا الفكرية، والنظم الإسلامية الرئيسة.**

2. نمط التعليم (اختر كل ما ينطبق)

م	نمط التعليم	عدد الساعات التدريسية	النسبة
1	تعليم التقليدي	30	100%
2	التعليم الإلكتروني		
3	التعليم المدمج • التعليم التقليدي • التعليم الإلكتروني		
4	التعليم عن بعد		

3. الساعات التدريسية (على مستوى الفصل الدراسي)

م	النشاط	ساعات التعلم	النسبة
1	محاضرات	30	100
2	معمل أو إستوديو		
3	ميداني		

4	دروس إضافية		
5	أخرى		
	الإجمالي		

ب. نواتج التعلم للمقرر واستراتيجيات تدريسها وطرق تقييمها:

الرمز	نواتج التعلم	رمز ناتج التعلم المرتبط بالبرنامج	استراتيجيات التدريس	طرق التقييم
1.0	المعرفة والفهم			
1.1	يعرف مجالات الثقافة الإسلامية وأهميتها، وأهدافها وأثرها	لا ينطبق	المحاضرات الحوار والمناقشة	الاختبارات الأسئلة التقويمية الدورية.
1.2	يشرح أسس القيم ، ومصادر الفكر ومجالات النظم.	لا ينطبق	المحاضرات الحوار والمناقشة	الاختبارات الأسئلة التقويمية الدورية.
...				
2.0	المهارات			
2.1	يميز مجالات الثقافة الإسلامية	لا ينطبق	الحوار والمناقشة ورش العمل	مشاريع وأوراق العمل
2.2	يستنتج أثار القيم والفكر والنظم	لا ينطبق	ورش العمل	مشاريع وأوراق العمل
...				
3.0	القيم والاستقلالية والمسؤولية			
3.1	يعمل في فريق مراعيًا مجالات الثقافة الإسلامية	لا ينطبق	لعب أدوار الحوار والمناقشة	الأسئلة الشفوية والتحريرية
3.2	يلتزم بالقيم والنظم والفكر الإسلامي.	لا ينطبق	لعب أدوار	السلوك والأخلاق
...				

ج. موضوعات المقرر

م	قائمة الموضوعات	الساعات التدريسية المتوقعة
1	تمهيد ومدخل في : التعريف بمجالات الثقافة الإسلامية المجال الأول (القيم) - مفهوم القيم وأهميتها. - مصادر القيم وأسسها وأنواعها.	2

٢	مجالات القيم: - المعتقدات	2
	- الأحكام	2
	- الأخلاق	2
3	أثر القيم في معالجة التغيرات	1
4	المجال الثاني (الفكر) - مفهوم الفكر وأهميته. - مصادر الفكر ومكوناته.	3
5	الاختبار النصفي	1
6	قضايا فكرية معاصرة، وموقف الإسلام منها: 1ـ حقوق الإنسان: - تعريف الحق والانسان لغة وشرعاً - مصادر حقوق الإنسان في الإسلام - مصادر حقوق الإنسان في النظم الوضعية - نقد الهجمة على الإسلام باسم حقوق الإنسان - نقد الهجمة على المملكة العربية السعودية باسم حقوق الإنسان 2ـــ النسوية - معنى النسوية - نشأة مفهوم النسوية وتطوره - دخول النسوية للعالم العربي - آثار مفهوم النسوية على الأديان - آثار مفهوم النسوية على الفكر والمعرفة - آثار مفهوم النسوية على واقع المجتمع والفرد	3 2
7	3ـ الانتماء إلى الفرق والأحزاب والجماعات الضالة. ـ البيعة الشرعية ولزوم جماعة المسلمين. ـــ مفهوم الانتماء إلى الفرق والأحزاب والجماعات الضالة ـــ تحذير الإسلام من التفرق والتحزب ـــ خطر الأحزاب والجماعات الضالة والوقاية منها	2
8	المجال الثالث (النظم) - مفهوم النظم وأهميتها ومجالاتها.	2
9	- نظام تكوين الأسرة في الإسلام.(مفهومه، أسسه وأركانه، آثاره على الفرد والمجتمع)	3
10	نظام السوق والتعاملات الاقتصادية في الإسلام. .(مفهومه، أسسه وأركانه، آثاره على الفرد والمجتمع)	3
11	- نظام الحكم والبيعة في الإسلام. .(مفهومه، أسسه وأركانه، آثاره على الفرد والمجتمع)	2
.....		
	المجموع	30

د. أنشطة تقييم الطلبة

م	أنشطة التقييم	توقيت التقييم (بالأسبوع)	النسبة من إجمالي درجة التقييم
1	**الاختبار النصفي**	السابع	30%
2	**التقييم (أنشطة وواجبات أو بحوث أو اختبارات قصيرة)**	مستمر	20%
3	**الاختبار النهائي**	الثالث عشر	50%
..			

أنشطة التقييم (اختبار تحريري، شفهي، عرض تقديمي، مشروع جماعي، ورقة عمل وغيره).

ه. مصادر التعلم والمرافق:

1. قائمة المراجع ومصادر التعلم:

المرجع الرئيس للمقرر	**مذكرة خاصة أعدها قسم الثقافة الإسلامية**
المراجع المساندة	1- المعجم الفلسفي: جميل صليبا. 2- مفهوم الثقافة: ديني كوش ترجمة منير السعداني- 3- مقدمة ابن خلدون: عبدالرحمن محمد ابن خلدون- 4- تعريف الثقافة الإسلامية: د.مفرح القوسي 5- الجانب الثقافي عند ابن تيمية: د. عبدالله الصرامي- 6- أصول النظام الاجتماعي في الإسلام: الطاهر بن عاشور – 7- الأخلاق بين الفلاسفة وحكماء الإسلام: مصطفى حلمي- ن 8- نظام الحكم في الإسلام: فؤاد عبدالمنعم – 9- إعلام الموقعين: لابن القيم – 10- الضمانات الأساسية لحماية حقوق الإنسان في الإسلام: إدريس العلوي **11- الطرق الجكمية لابن القيم** **قواعد الأحكام العز بن عبد السلام**
المصادر الإلكترونية	**المكتبة الشاملة** **الجامع لكتب التراث الاسلامي والعربي**
أخرى	المكتبة

2. المرافق والتجهيزات المطلوبة:

العناصر	متطلبات المقرر
المرافق النوعية	**القاعات الدراسية -المكتبة**

العناصر	متطلبات المقرر
(القاعات الدراسية، المختبرات، قاعات العرض، قاعات المحاكاة ... إلخ)	
التجهيزات التقنية (جهاز عرض البيانات، السبورة الذكية، البرمجيات)	**جهاز عرض البيانات -الحاسب الآلي - شبكة الإنترنت**
تجهيزات أخرى (تبعاً لطبيعة التخصص)	**لا يوجد**

و. تقويم جودة المقرر:

مجالات التقويم	المقيمون	طرق التقييم
فاعلية التدريس	إدارة القسم	الزيارة والمتابعة
فاعلية طرق تقييم الطلاب	الطلاب – المقوم المستقل	مراجعة الوثائق – التغذية الراجعة
مصادر التعلم	القسم العلمي	الاستبانات
مدى تحصيل مخرجات التعلم للمقرر	إدارة القسم – المقوم المستقل	مراجعة النتائج
أخرى		

المقيمون (الطلبة، أعضاء هيئة التدريس، قيادات البرنامج، المراجع النظير، أخرى (يتم تحديدها).
طرق التقييم (مباشر وغير مباشر).

ز. اعتماد التوصيف:

جهة الاعتماد	مجلس قسم الثقافة الإسلامية
رقم الجلسة	الجلسة التاسعة
تاريخ الجلسة	11/ 9/ 1444هـ الموافق 4/2/ 2022م.

توصيف المقرر الدراسي

(بكالوريوس)

اسم المقرر:	المهارات اللغوية و الكتابية
رمز المقرر:	101-عرب-2
البرنامج:	الهندسة الكهربائية
القسم العلمي:	الهندسة الكهربائية
الكلية:	كلية الهندسة
المؤسسة:	جامعة نجران
نسخة التوصيف:	1
تاريخ آخر مراجعة:	1/1/2025

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أ. معلومات عامة عن المقرر الدراسي:

التعريف بالمقرر الدراسي											
1. الساعات المعتمدة:	**ساعتان**										
2. نوع المقرر											
أ.	متطلب جامعة	√	متطلب كلية		متطلب تخصص		متطلب مسار				
ب.	إجباري	√	اختياري								
3. السنة / المستوى الذي يقدم فيه المقرر	3/5										
4. الوصف العام للمقرر **يتناول المقرر كل ما يمكن الطالب من قواعد اللغة العربية، والتعبير السليم كتابيا بحيث يكون خاليا من الأخطاء الإملائية والأسلوبية وبعيدا عن الأخطاء الشائعة.**											
5. المتطلبات السابقة لهذا المقرر (إن وجدت) **لا يوجد**											
6. المتطلبات المتزامنة مع هذا المقرر (إن وجدت) **لا يوجد**											
7. الهدف الرئيس للمقرر **أن يتجنب الطلاب الأخطاء اللغوية والأخطاء الشائعة في الحديث والكتابة، وأن يتمكنوا من التعبير اللغوي السليم في فنون اللغة النثرية.**											

1. نمط التعليم

م	نمط التعليم	عدد الساعات التدريسية	النسبة
1	تعليم اعتيادي		
2	التعليم الإلكتروني	**24**	**100%**
3	التعليم المدمج • التعليم الاعتيادي • التعليم الإلكتروني		
4	التعليم عن بعد		

2. الساعات التدريسية (على مستوى الفصل الدراسي)

م	النشاط	ساعات التعلم	النسبة
1	محاضرات	**24**	**100**
2	معمل أو إستوديو		
3	ميداني		
4	دروس إضافية		

5	أخرى	6	
	الإجمالي	30	

ب. نواتج التعلم للمقرر واستراتيجيات تدريسها وطرق تقييمها:

الرمز	نواتج التعلم	رمز ناتج التعلم المرتبط بالبرنامج	استراتيجيات التدريس	طرق التقييم
1.0	المعرفة والفهم			
1.1	**أن يبين المواقع النحوية لعناصر التراكيب العربية و الأخطاء الشائعة فيها أساليبها ، و قواعد كتابتها بصورة صحيحة في أغراض متنوعة .**		**المحاضرة التعلم الذاتي**	**الاختبار الفصلي و النهائي**
1.2				
...				
2.0	المهارات			
2.1	**أن يميز بين الوظائف النحوية والأسلوبية للألفاظ العربية ، وبين فنون الكتابة المختلفة التي يستخدمها في حياته العملية واليومية.**		**المحاضرة التعلم الذاتي**	**الاختبار الفصلي و النهائي**
2.2				
...				
3.0	القيم والاستقلالية والمسؤولية			
3.1	**أن يستشعر أهمية اللغة العربية كلغة للقرآن الكريم و وسيلة للتواصل و التعبير.**		**التعلم الذاتي**	**الملاحظة**
3.2				
...				

ج. موضوعات المقرر

م	قائمة الموضوعات	الساعات التدريسية المتوقعة
1	تعريف الكلام و أقسام الكلمة و علامات كل قسم	2
2	الكلام على الأفعال (تقسيمها إلى ماض و مضارع و أمر - تقسيمها من حيث الصحة و الاعتلال - إعراب الفعل و بناؤه - نواصب المضارع و جوازمه)	2
3	الكلام على الأسماء (تقسيم الاسم لمفرد و مثنى و جمع - تقسيمه لمذكر و مؤنث - تقسيمه لصحيح و معتل - تقسيمه لنكرة و معرفة)	2
4	رفع الاسم و مواضعه (الفاعل - نائب الفاعل - المبتدأ - الخبر - اسم كان - خبر إن)	2
5	نصب الاسم و مواضعه (خبر كان - اسم إن - المفاعيل بأنواعها - الحال - التمييز- المستثنى - الحال - التمييز)	2
6	جر الاسم و مواضعه (المجرور بالحرف - المجرور بالإضافة) التوابع و أنواعها (العطف - البدل - النعت - التوكيد)	2
7	الكتابة (تعريفها لغة و اصطلاحًا ومشكلاتها - اللفظة و شروطها - الأخطاء الشائعة - طريقة الكشف في المعجم عن اللفظة)	2
8	قواعد رسم الهمزة	2
9	الجملة (تعريفها - شروطها - أركانها - أنواعها - الجملة و الأسلوب)	3
10	الفقرة (بناؤها- تنظيم الاحداث فيها - أوصافها)	2
11	الكتابة الوظيفية (التقرير - التلخيص - الرسالة الإدارية - السيرة الذاتية - اليوميات و المذكرات - محاضر الجلسات - اللافتات و الإعلانات)	2
12	الكتابة الإبداعية (المقال - الخاطرة - القصة - المسرحية)	2
	المجموع	24

د. أنشطة تقييم الطلبة

م	أنشطة التقييم	توقيت التقييم (بالأسبوع)	النسبة من إجمالي درجة التقييم
1	**اختبار فصلي**	**السادس**	**30%**
2	**واجبات و مشاركات**	**ممتدة**	**20%**
3	**اختبار نهائي**	**نهاية الفصل الدراسي**	**50%**
...			

أنشطة التقييم (اختبار تحريري، شفهي، عرض تقديمي، مشروع جماعي، ورقة عمل وغيره)

ه. مصادر التعلم والمرافق:

1. قائمة المراجع ومصادر التعلم:

المرجع الرئيس للمقرر	**1 - النحو المبسط ، محمد ياسين ربابة – دار إحياء علم الدين ، دمشق – سورية ، الطبعة الرابعة .** **2 - التحرير العربي و مهارات الكتابة ، مسفر بن محماس الكبيري ، مكتبة المتنبي ، الدمام ، ط2 ، 2014م**
المراجع المساندة	**- النحو الواضح في قواعد اللغة العربية ، على الجارم ، مصطفى أمين ، دار المعارف ، مصر.** **المعجم العربي ، د. رياض زكى القاسم ، دار المعرفة ، بيروت .** **- معجم الأخطاء الشائعة ، محمد العدناني ، مكتبة لبنان ، ط2 ، 1980م .** **جامع الدروس العربية ، مصطفى الغلاييني ، مؤسسة الرسالة، بيروت ، ط1 ، 2008م .** **- معجم الأغلاط اللغوية المعاصرة ، محمد العدناني ، مكتبة لبنان ، ط1 ، 1984م** **التطبيق الصرفي ، د . عبده الراجحي ، دار المسيرة ، عمان ، ط1 ، 2008م**
المصادر الإلكترونية	موقع الورّاق . http://pdfbooks.net/vb/login.php منتديات الكتب المصورة

	- موقع اللغة العربية . - موقع تعليم اللغة العربية . - شبكة الفصيح لعلوم العربية . http://www.alfaseeh.com/vb/index.php
أخرى	أقراص ممغنطة (CD) الموسوعة الشاملة. أقراص ممغنطة (CD) الموسوعة النحوية.

2. المرافق والتجهيزات المطلوبة:

العناصر	متطلبات المقرر
المرافق النوعية (القاعات الدراسية، المختبرات، قاعات العرض، قاعات المحاكاة ... إلخ)	**-قاعة عرض سعتها 30 طالبا للعرض الإلكتروني للمحاضرات المسجلة.**
التجهيزات التقنية (جهاز عرض البيانات، السبورة الذكية، البرمجيات)	**-توفير جهاز إلكتروني لكل 4 طلاب وتوفير سبورة ذكية**
تجهيزات أخرى (تبعاً لطبيعة التخصص)	**توفير أشرطة الفيديو التي تحتوي على المادة العلمية في مجال النحو و المهارات الكتابية .**

و. تقويم جودة المقرر:

مجالات التقويم	المقيمون	طرق التقييم
تقييم فاعلية التدريس	**الطلاب، قيادات البرنامج، المراجع النظير**	**استبيانات تقويم المقرر- استطلاعات الرأي عبر موقع الجامعة - استطلاع رأي تقييم مخرجات التعلم (مباشر)**
		تقييم النظير - صندوق الشكاوى والمقترحات (غير مباشر)

مجالات التقويم	المقيمون	طرق التقييم
تقييم مدى تحصيل مخرجات التعلم للمقرر	الطلاب، قيادات البرنامج، المراجع النظير	استبيانات تقويم المقرر- استطلاعات الرأي عبر موقع الجامعة - استطلاع رأي تقييم مخرجات التعلم (مباشر)
		تقييم النظير - صندوق الشكاوى والمقترحات (غير مباشر)
تقييم فاعلة طرق تقييم الطلاب	الطلاب، قيادات البرنامج، المراجع النظير	استبيانات تقويم المقرر- استطلاعات الرأي عبر موقع الجامعة - استطلاع رأي تقييم مخرجات التعلم (مباشر)
		تقييم النظير - صندوق الشكاوى والمقترحات (غير مباشر)
تقييم مصادر التعلم	الطلاب، أعضاء هيئة التدريس ، قيادات البرنامج، المراجع النظير	استبيانات تقويم المقرر- استطلاعات الرأي عبر موقع الجامعة - استطلاع رأي تقييم مخرجات التعلم (مباشر)
		تقييم النظير - صندوق الشكاوى والمقترحات (غير مباشر)

المقيمون (الطلبة، أعضاء هيئة التدريس، قيادات البرنامج، المراجع النظير، أخرى (يتم تحديدها).
طرق التقييم (مباشر وغير مباشر).

ز. اعتماد التوصيف:

جهة الاعتماد	مجلس قسم الهندسة الكهربائية
رقم الجلسة	14470730-1471-00010
تاريخ الجلسة	16/1/2026

Course Specification
(Bachelor)

Course Title:	Computer Applications in Mechatronics Engineering
Course Code:	205-MRE-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	1
Last Revision Date:	26/1/2026

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D. Students Assessment Activities 5
E. Learning Resources and Facilities 5
F. Assessment of Course Quality 6
G. Specification Approval 6

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (2,1,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☒ College	☐ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: 5th/3rd					
4. Course General Description:					
Introduction to MATLAB system, generate matrices and perform operations on them, plot data, annotate graphs, create scripts and functions, construct and manipulate data structures, set up basic data analysis. Interacting Simulink Software with MATLAB, Creating a Simulink Model, Modeling a Dynamic Control System. Introduction to LabVIEW virtual instruments (VIs), LabVIEW environments, creating, editing and debugging a VI, creating a sub VI, loops and charts, arrays, graphs, clusters, case and sequence structures, formula nodes.					
5. Pre-requirements for this course (if any):					
204-GEC-3					
6. Co-requisites for this course (if any):					
NA					
7. Course Main Objective(s):					
1 Use the MATLAB GUI and development environment effectively. 2 Design programs to solve engineering and mathematical problems. 3 Build block diagrams in Simulink to model engineering systems. 4 Understand LabVIEW environment and use built in VI's. Course Main Objective.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	30
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		60

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Formulate the MATLAB GUI.	1	Lectures and Problem-solving.	In class quizzes, Test and Final exam.
1.2				
1.3				
2.0	**Skills**			
2.1	Carry out computations and visualize data in MATLAB.	6	• Offering extra tutorials for students • Encourage class participation	• Class participation Quizzes • Midterm exams. • Final Exams at the end of the semester.
2.2	Design programs to solve engineering and mathematical problems.	2	• Offering extra tutorials for students • Encourage class participation	• Class participation (Quizzes) • Midterm exams. • Home work • Final Exams at the end of the semester.

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
2.3	Design graphical programming environment using LabVIEW	2	Class Lectures and Lab	• Mini-project • Final Exams at the end of the semester.
2.4	Design Simulink models to simulate engineering systems.	2	Class Lectures and Lab	• Mini-project • Final Exams at the end of the semester.
2.5	Communicate effectively to perform the presentation.	3		Class Lectures and Lab
3.0	**Values, autonomy, and responsibility**			
3.1	Perform as an effective team-player in executing related project with imposed design constraints.	5		Class Lectures and Lab
3.2	Recognize ethical and professional responsibilities in engineering situations and make informed judgments	4	Lectures	- Mini project Report
3.3				

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to MATLAB system	4
2.	Generate matrices and perform operations on them	8
3.	Plot data, annotate graphs,	8
4.	Construct and manipulate data structures	12
5.	Set up a basic data analysis	8
6.	Creating a Simulink Model, Modeling a Dynamic Systems.	8
7.	Introduction to LabVIEW, virtual instruments, LabVIEW environments,	8
8.	Creating, editing and debugging a VI, creating a sub VI, loops and charts.	4
Total		**60**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz 1	Week 4	5 %
2.	Quiz 2	Week 7	5 %
3.	Midterm	Week 10	30 %
4.	Homework, Mini-project and presentation	Week 13	10 %
5.	Final Exam (Practical)		20 %
6.	Final Exam (Theoretical)	At the end of the semester as determined by the academic calendar	30 %
	Sum		**100**

*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	Holly Moore, MATLAB for Engineers, 3/E, ISBN-10: 0132103257, ISBN-13: 9780132103251, Prentice Hall, 2012.
Supportive References	Ronald W. Larsen, LabVIEW for Engineers, ISBN-10: 0136094295, ISBN-13: 9780136094296, Prentice Hall, 2011.
Electronic Materials	None
Other Learning Materials	• MATLAB 2016a with Simulink Software. www.mathworks.com •LabVIEW 2011, Course manual, Course software version 2011, www.ni.com/LabVIEW

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room for a maximum of 20 students
Technology equipment (projector, smart board, software)	- Laptops - Data show
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester

Assessment Areas/Issues	Assessor	Assessment Methods
		to identify weaknesses in the course.
Effectiveness of Students assessment	Students	Feedback from Test 1, Test 2, and Final exam records.
Quality of learning resources	Students	A questionnaire is administered at the end of every semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

Course Specification
(Bachelor)

Course Title:	Electrical Circuits
Course Code:	212-MRE-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	1
Last Revision Date:	26/1/2026

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G. Specification Approval 6

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (3,0,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: 5th/3rd					
4. Course General Description:					
Basic circuit elements and concepts; Basic laws of circuit theory: Ohm's law, Kirchhoff's law; Circuit theorems: superposition principle, Thevenin and Norton theorems; maximum power transfer theorem Techniques of circuit analysis: Nodal and mesh analysis; Sinusoidal sources and the concept of phasor in circuit analysis; Introduction to concept of active, reactive, complex power and power factor.					
5. Pre-requirements for this course (if any):					
106-MAT-3 and 105-PHY-3					
6. Co-requisites for this course (if any):					
NA					
7. Course Main Objective(s):					
1. Explain basic circuit elements and concepts. 2. Explain basic laws of circuit theory. 3. Analyze series/parallel DC circuits using Ohm's and Kirchhoff's laws. 4. Analyze DC circuits using mesh and Nodal methods. 5. Analyze circuits using Thevenin's, Norton's, superposition, and maximum power transfer theorems. **6.** Analyze AC circuits.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		45

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Identify and analyze Series/Parallel DC Circuits using Ohm's and Kirchhoff's Laws.	1	- Lectures - Tutorials	- Quizzes - Test 1 Final exam
1.2				
1.3				
2.0	**Skills**			
2.1	Analyze DC Circuits using Mesh and Nodal Methods of Analysis	6	- Lectures - Tutorials	- Quizzes - Test 1 Final exam
2.2	Analyze DC Circuits using Superposition, Thevenin's, Norton's and Maximum power transfer Theorems.	6	- Lectures - Tutorials	- Quizzes - Test 2 Final exam
2.3	Analyze AC Circuits	6	- Lectures - Tutorials	- Quizzes - Test 2 Final exam
3.0	**Values, autonomy, and responsibility**			
3.1				
3.2				
3.3				

C. Course Content

No	List of Topics	Contact Hours
1.	Current, voltage and resistance.	3
2.	Ohm's law, power and energy calculations.	3
3.	Kirchhoff's current and voltage laws in series/parallel DC circuit analysis.	6
4.	Mesh, nodal analysis and source transformation.	9
5.	Superposition, Thevenin, Norton and maximum power transfer theorems.	9
6.	Sinusoidal Alternating Waveforms and phasor representation.	6
7.	Series, Parallel and Series/Parallel AC circuits	9
	Total	0

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Test 1	Week 6	20 %
2.	Test 2	Week 12	20 %
3.	Quizzes	At the completion of every CLO	10 %
4.	Final Exam	At the end of the semester as determined by the academic calendar	50 %
5.			
	Sum		100

*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	Boylestad, "Introductory Circuit Analysis", Twelfth Edition, Pearson Prentice Hall. 2010.
Supportive References	• James W. Nilsson and Susan A. Riedel, "Electric Circuits", EIGHTH EDITION, Pearson Prentice Hall. • Fundamentals of Electric Circuits by C. D. Alexander and M. N. O. Sadiku, third Edition, Mc Graw-Hill Education, 2007.
Electronic Materials	http://lib.nu.edu.sa/digitallibbrary.aspx www. en.wikipedia.org/wiki/Electrical_network www. allaboutcircuits.com
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room for a maximum of 20 students
Technology equipment (projector, smart board, software)	- Laptops - Data show
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester to identify weaknesses in the course.
Effectiveness of Students assessment	Students	Feedback from Test 1, Test 2, and Final exam records.
Quality of learning resources	Students	A questionnaire is administered at the end of every semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

Course Specification
(Bachelor)

Course Title:	Electrical Circuits Lab
Course Code:	213-MRE-1
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	1
Last Revision Date:	26/1/2026

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A. General information about the course:

1. 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/3rd					
4. Course General Description:					
This lab course introduces circuit using Ohm's law, KVL, KCL, Superposition, Thevenin's and Maximum power transfer theorems in DC circuits. Topics include also AC circuits, resonant circuits.					
5. Pre-requirements for this course (if any):					
NA					
6. Co-requisites for this course (if any):					
212-MRE-3					
7. Course Main Objective(s):					

1. Recognize electrical laboratory devices.
2. Recognize and analyze of Electric Circuits using Fundamental laws: Ohm's law, Kirchhoff voltage law (KVL) and Kirchhoff current law (KCL).
3. Analyze of basic series, parallel and series-parallel Circuits.
4. Describe and analyze Electric Circuits using superposition, Thevenin, and maximum power transfer theorems.
5. Categorize the response of various types of resonant circuits.
6. Analyze Response of Transient Response of 1st Order Circuits.
7. Making use of the equipment's and techniques in the laboratory to translate the theory into reality.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	30	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	0
2.	**Laboratory/Studio**	30
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		45

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Recognize electrical laboratory devices	1	- Pre-lab lectures - Experiment	- Reports - Pre-labs - Lab Performance - Mid Term Exam - Final Exam
1.2				
1.3				
2.0	**Skills**			
2.1	Verify Ohm's and Kirchhoff's laws.	6	- Pre-lab lectures - Experiment	- Reports - Pre-labs - Lab Performance - Mid Term Exam Final Exam
2.2	Apply Superposition, Thevenin and Maximum power transfer theorems.	6	- Pre-lab lectures - Experiment	- Reports - Pre-labs - Lab Performance - Mid Term Exam Final Exam
2.3	Estimate experimentally the resonance frequency of series	6	- Pre-lab lectures - Experime	- Reports - Pre-labs - Lab

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	and parallel AC circuits.		nt	Performance - Mid Term Exam Final Exam
2.4	Examine the transient response.	6	- Pre-lab lectures - Experiment	- Reports - Pre-labs - Lab Performance - Mid Term Exam Final Exam
2.5	Communicate effectively in group discussion and oral examination.	3	- Experiment	- Lab Performance and oral examination Reports
3.0	**Values, autonomy, and responsibility**			
3.1	Recognize ethical and professional responsibilities in engineering situations and make informed judgments	4	- Experiment	- Reports
3.2	Work effectively as a member of the team.	5	- Experiment	Lab Performance and oral examination
3.3				

C. Course Content

No	List of Topics	Contact Hours
1.	Resistor Color Code	2
2.	Ohm s Law, Series and parallel DC circuit (KVL & KCL)	4
3.	Series-Parallel DC Circuits	4
4.	Superposition Theorem	4
5.	Mid Term Exam	2
6.	Maximum Power Transfer Theorem	4
7.	Ac circuit	6
8.	(RC) Low pass and High pass filters	4
Total		0

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Reports	Every experiment	10%
2.	Pre-lab Quiz	Every experiment	10%
3.	Lab Performance	Every experiment	10%
4.	Mid Term Exam	8	20%
5.			
		Sum	**100**

*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	Boylestad , "Introductory Circuit Analysis" , Twelfth EDITION, Pearson Prentice Hall.
Supportive References	James W. Nilsson and Susan A. Riedel, "Electric Circuits", EIGHTH EDITION, Pearson Prentice Hall.
Electronic Materials	Fundamentals of Electric Circuits by C. D. Alexander and M. N. O. Sadiku, third Edition, Mc Graw-Hill Education, 2007.
Other Learning Materials	http://lib.nu.edu.sa/digitallibbrary.aspx

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room for a maximum of 20 students
Technology equipment (projector, smart board, software)	- Laptops - Data show
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester to identify weaknesses in the course.
Effectiveness of Students assessment	Students	Feedback from Test 1, Test 2, and Final exam records.

Assessment Areas/Issues	Assessor	Assessment Methods
Quality of learning resources	Students	A questionnaire is administered at the end of every semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

Public - عام

Course Specification
(Bachelor)

Course Title:	Fluid Mechanics
Course Code:	230 MRE-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	College of Engineering
Institution:	Najran University
Version:	1.0
Last Revision Date:	19/02/2026

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A. General information about the course:

1. Course Identification

1. Credit hours: 3(2,1,0) (Theory, Lab, Tutorial)

2. Course type

A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		

3. Level/year at which this course is offered: Third Year \ Level 6

4. Course General Description:

Definition and Properties of Fluids, Its Classification, Normal and Shear Stress in Fluids, Pressure at a Point, Basic Equation of Fluid Statics, Hydrostatic Forces on Submerged Bodies, Buoyancy and Stability. Kinematics of Fluid Flow: Types of Motions, Streamlines, Pathlines, Streaklines, Velocity and Rotation, Stream Function, Vorticity and Circulation, Irrotational Flow, Velocity Potential Function. Dynamics of Ideal Fluid Flow: Euler's Equation, Bernoulli's Equation, Its Application to Different Types of Fluid Flow. Flow Measuring Devices, Venturi meter, Orifice Meter, Nozzle Meter, Pitot Static Tube, Hydraulic Coefficients. Flow Through Pipes, Major and Minor Losses in Pipes, Power Transmission by a Pipe Line

5. Pre-requirements for this course (if any):

205-GEC-3

6. Co-requisites for this course (if any):

NIL

7. Course Main Objective(s):

1. Explain the basic concepts of fluid mechanics and recognize the various types of fluid flow problems encountered in practice, the continuum assumption and the no- slip condition.
2. Apply the fluid statics principles to calculate the pressure variation in a static fluid and calculate the forces exerted on plane and curved surfaces, and understand applications of manometers and other pressure-measuring devices.
3. Apply Bernoulli equation to different types of flow problems and understand

the limitations of this equation.
4 Demonstrate a basic understanding of fluid flow kinematics and the Eulerian/ Lagrangian descriptions of fluid flow.
5. Apply the Buckingham Pi theorem and recognize the importance of dimensional analysis in fluid mechanics.

2. Teaching mode (mark all that apply)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	15
3.	**Field**	
4.	**Tutorial**	15
5.	**Others (specify)**	
Total		60

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	15
3.	**Field**	
4.	**Tutorial**	15
5.	**Others (specify)**	
Total		60

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	**Contributes primarily to the students' knowledge of engineering topics, but does not provide design experience.**	**1**	**TS:1-Interactive lectures using PowerPoint slides TS:2- Engaging the students in problem-based learning through**	**-Test performance evaluation -Evaluation of participation in discussion and group**

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			tutorials TS: 3 – Associating the topics in each chapter with the CLO. TS:4 – Conducting quizzes from each chapter TS:5 – Giving more example programs in the lecture TS: 6 – Discussion with the students in the class hours	assignments
1.2	Develop the necessary skills to deal with fluid mechanics and its applications.	7	TS:1-Interactive lectures using PowerPoint slides TS:2- Engaging the students in problem-based learning through tutorials TS: 3 – Associating the topics in each chapter with the CLO. TS:4 – Giving more assignment from each chapter TS:5 – Giving more example programs in the lecture TS: 6 – Discussion with the students in the class hours	-Test performance evaluation -Evaluation of participation in discussion and group assignments
...				
2.0	Skills			
2.1	Illustrate difference methods for	6	TS:1-Interactive lectures using	●Locally Developed

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	problems solving, reasoning for each problem solved		PowerPoint slides TS:2- Engaging the students in problem-based learning through tutorials TS: 3 – Associating the topics in each chapter with the CLO. TS:4 – Conducting quizzes from each chapter TS: 5 – Discussion with the students in the class hours	Exams such as Quiz, Mid & Final Exams with scoring rubrics ●Assignments involving critical and logical thinking questions ●Quizzes
2.2				
...				
3.0	**Values, autonomy, and responsibility**			
3.1	Solve the problem by asking questions during the office hour.	5	TS:1-Interactive lectures using PowerPoint slides TS:2- Engaging the students in problem-based learning through tutorials TS: 3 – Associating the topics in each chapter with the CLO. TS:4 – Conducting midterm and Final Exam from each chapter TS:5 – Giving more example programs in the lecture TS: 6 – Discussion with the students	Locally Developed Exams such as Quiz, Mid & Final Exams with scoring rubrics ●Assignments involving critical and logical thinking questions ●Quizzes

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			in the class hours	
3.2	Discuss opinion and justify for communicating in Teams	4	TS:1-Interactive lectures using PowerPoint slides TS:2- Engaging the students in problem-based learning through tutorials TS: 3 – Associating the topics in each chapter with the CLO. TS:4 – Conducting midterm and Final Exam from each chapter TS:5 – Giving more example programs in the lecture TS: 6 – Discussion with the students in the class hours	Locally Developed Exams such as Quiz, Mid & Final Exams with scoring rubrics ●Assignments involving critical and logical thinking questions ●Quizzes
...				

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to basic concepts and definitions: Definition and Properties of Fluids, Its Classification	6
2.	Fluid statics. Forces on submerged surfaces and bodies: Normal and Shear Stress in Fluids, Pressure at a Point, Basic Equation of Fluid Statics, Hydrostatic Forces on Submerged Bodies, Buoyancy and Stability	12
3.	Fluid Kinematics: Types of Motions, Streamlines, Pathlines, Streaklines, Velocity and Rotation, Stream Function, Vorticity and Circulation, Irrotational Flow, Velocity Potential Function.	12
4.	Fluid Dynamics: Bernoulli equation and Dimensional analysis: Euler's Equation, Bernoulli's Equation, Its Application to Different Types of Fluid Flow	12

5.	Flow Measuring Devices, Venturi meter, Orifice Meter, Nozzle Meter, Pitot Static Tube, Hydraulic Coefficients	10
6.	Flow Through Pipes, Major and Minor Losses in Pipes, Power Transmission by a Pipe Line	8
Total		60

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	Random	05
2.	Midterm 1 Exam	Week 6	15
3.	Midterm 2 Exam	Week 12	15
4.	Lab Report	Week 13	5
4.	Mini Project	Week 13	10
5.	Final Exam (Lab)	At the end of the semester as determined by the academic calendar	20
6.	Final Exam (Lab)	At the end of the semester as determined by the academic calendar	30
Sum			100

*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	"Fluid Mechanics, Fundamentals and Applications," 1st Ed, Yunus A. Çengel and John M. Cimbala, McGraw Hill higher Edu. 2005
Supportive References	“Fluid Mechanics” 7th Ed, F. M. White, McGraw Hill, 2021
Electronic Materials	Online custom books
Other Learning Materials	NA

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms and laboratories
Technology equipment	--

Items	Resources
(projector, smart board, software)	
Other equipment (depending on the nature of the specialty)	--

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Program Leaders and Peer Reviewer	Direct, Indirect
Effectiveness of Students assessment	Students & Faculty	Direct and Indirect
Quality of learning resources	Students & Faculty	Direct and Indirect
The extent to which CLOs have been achieved	Students & Faculty	Direct and Indirect
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	14470730-1471-00010
DATE	16/1/2026

Course Specification
(Bachelor)

Course Title:	Engineering Mathematics
Course Code:	202-ELE-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	1
Last Revision Date:	26/1/2026

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G. Specification Approval 6

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (3,0,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: 5th/3rd					
4. Course General Description:					
Vector analysis including vector fields, gradient, divergence, curl, line and surface integrals, Gauss' and Stokes' theorems. Introduction to complex variables, eigenvalues and eigenvectors. Commonly used engineering functions, series and sequences.					
5. Pre-requirements for this course (if any)**:**					
203-MAT-3					
6. Co-requisites for this course (if any)**:**					
NA					
7. Course Main Objective(s):					
1 Understand the definitions of Vector Space and its linear Independence 2 Solve Eigen value problems and apply Cayley Hamilton Theorem. 3 Study Curl and divergence with their applications. 4 Derive mathematical models of physical systems.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		45

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Identify, formulate, and solve engineering problems using mathematical theorem.	1	- Lectures - Tutorials Computer programing tools (MATLAB)	- Homework - Assignment - Quizzes Final exam
1.2	Apply knowledge of engineering mathematics to analyze the electrical systems.	7	- Lectures - Tutorials Computer programing tools (MATLAB)	- Homework - Assignment - Quizzes - Test 1 Final exam
1.3				
2.0	**Skills**			
2.1	Solving electrical engineering applications by using mathematical theorem.	6	- Lectures - Tutorials Computer programing tools (MATLAB)	- Homework - Assignment - Quizzes - Test 2 Final exam
2.2				
2.3				
3.0	**Values, autonomy, and responsibility**			
3.1				
3.2				
3.3				

C. Course Content

No	List of Topics	Contact Hours
1.	**Complex numbers** Phasor rotation by $\pi/2$ Complex numbers and operations Solution of quadratic equations Polar form of a complex number Applications of complex numbers to AC linear circuits The importance of being exponential	15
2.	**Vectors** Vectors and vector quantities Addition and subtraction of vectors Magnitude and direction of a 2D vector – polar coordinates Application of vectors to represent waves phasors) Multiplication of a vector by a scalar and unit vectors Basis vectors Products of vectors Vector equation of a line	15
3.	**Vector calculus** The gradient of a scalar field Differentiating vector fields The scalar line integral Surface integrals	15
4.	**Systems of linear equations, matrices, and determinants** Matrices Systems of Equations Gauss elimination The inverse and determinant of a 3×3 matrix	15
5.		
	Total	**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Test 1	Week 6	20 %
2.	Test 2	Week 12	20 %
3.	Assignments/Quizzes/group project and presentation	Every chapter	10 %
4.	Final Exam	At the end of the semester as determined by the academic calendar	50 %

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
	Sum		**100**

*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	Advanced Engineering Mathematics by P. O'Neil, International Student Edition. 2011
Supportive References	Mathematics for Electrical Engineering and Computing by Mary Attenborough, 2003
Electronic Materials	None
Other Learning Materials	Computer programing tools (MATLAB)

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room for a maximum of 20 students
Technology equipment (projector, smart board, software)	- Laptops - Data show
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester to identify weaknesses in the course.
Effectiveness of Students assessment	Students	Feedback from Test 1, Test 2, and Final exam records.
Quality of learning resources	Students	A questionnaire is administered at the end of every semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	14470730-1471-00010
DATE	16/1/2026

Course Specification
(Bachelor)

Course Title:	Fundamental of Mechatronics
Course Code:	241-MRE-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	1
Last Revision Date:	26/1/2026

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G. Specification Approval 6

A. General information about the course:

1. Course Identification

1. Credit hours: 3(3,0,1) (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: 10th/5th					
4. Course General Description:					
This course introduces the fundamental principles of mechatronics, emphasizing the integration of mechanical systems, electronics, sensors, actuators, and basic control concepts. Students learn how measurement systems, signal conditioning, actuators, and programmable controllers are used in modern engineering systems. The course establishes the theoretical and practical foundation required for advanced mechatronic system design.					
5. Pre-requirements for this course (if any)**:**					
NA					
6. Co-requisites for this course (if any)**:**					
NA					
7. Course Main Objective(s):					
At the end of the course, students should be able to: • Understand the interdisciplinary nature of mechatronics systems. • Explain measurement systems and sensor characteristics. • Analyze signal conditioning techniques. • Identify and apply actuators in mechatronic applications. • Understand basic control systems and PLC concepts. • Develop readiness for embedded and system-level design.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	15
5.	**Others (specify)**	0
Total		60

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Explain the principles and scope of mechatronics systems.	1	- Class Lectures, - Tutorials	Quizzes, Mid Term Exams, Final Exam
1.2	Identify and select appropriate sensors for engineering applications	1	- Class Lectures, - Tutorials	Quizzes, Mid Term Exams, Final Exam
2.0	**Skills**			
2.1	Analyze signal conditioning and measurement systems.	6	- Class Lectures - Tutorials	Quizzes, Mid Term Exams, Final Exam
2.2	Describe and apply electrical, hydraulic, and pneumatic actuators	6	- Class Lectures Tutorials	Quizzes, Mid Term Exams, Final Exam
2.3	Analyze open-loop and closed-loop control systems.	6	- Class Lectures - Tutorials	Quizzes, Mid Term Exams, Final Exam
			-	
3.0	**Values, autonomy, and responsibility**			
3.1				
3.2				

C. Course Content

No	List of Topics	Contact

		Hours
1.	Introduction to Mechatronics & Systems	08
2.	Sensors & Transducers	10
3.	Sensor Performance & Selection	06
4.	Signal Conditioning and measument devices	08
5.	Data Acquisition & Interfaces	08
6.	Actuators: Electrical Motors, Pneumatic & Hydraulic	10
7.	Control Systems Basics	06
8.	PLC Basics	04
9.		
10.		
Total		60

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	Random	10
2.	Midterm 1 Exam	Week 6	15
3.	Midterm 2 Exam	Week 12	15
4.	Mini Project	Week 13	10
5.	Final Exam	At the end of the semester as determined by the academic calendar	50
6.			
	Sum		**100**

*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	W. Bolton., Mechatronics: Electronic Control Systems in Mechanical and Electrical Engineering, , Pearson, 6th edition, 2015.
Supportive References	Nitaigour Mahalik, MECHATRONICS : PRINCIPLES, CONCEPTS AND APPLICATIONS, Wiley, McGraw Hill Education, 2017
Electronic Materials	Youtube channel for condition monitoring concepts
Other Learning Materials	Lecture notes

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room/Lab for a maximum of 25 students
Technology equipment (projector, smart board, software)	- Laptops - Data show
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester to identify weaknesses in the course.
Effectiveness of Students assessment	Students	Feedback from Test 1, Test 2, and Final exam records.
Quality of learning resources	Students	A questionnaire is administered at the end of every semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	14470730-1471-00010
DATE	16/1/2026

Course Specification
(Bachelor)

Course Title:	Signals and Systems Analysis
Course Code:	242-ELE-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	1
Last Revision Date:	26/1/2026

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A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (3,0,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: 6th/3rd					
4. Course General Description:					
Motivation, Signal Classifications, Signal Operations, Eigen Functions; Theories of Fourier series for continuous and discrete time signals, Linear circuits and system concepts, impulse response, convolution and transfer function; Frequency response of systems, Fourier Transform, Laplace transform and z-transform with applications; Nyquist theorem for sampling of analog signals.					
5. Pre-requirements for this course (if any)**:**					
240- MRE -3					
6. Co-requisites for this course (if any)**:**					
NA					
7. Course Main Objective(s):					
1. Use the different theories to analyze: i. Analog Signals ii. Digital Signals 2. Simulate the signal in both time and frequency domains.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		45

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Distinguish between continuous and discrete time signal and systems.	1	- Lectures - Tutorials	- Assignment - Quizzes - Midterm exam Final exam
1.2				
1.3				
2.0	**Skills**			
2.1	Manipulate different signal transformation techniques.	6	- Lectures - Tutorials	- Assignment - Quizzes - Midterm exam Final exam
2.2	Evaluate fundamental signal and system parameters, such as energy, power and bandwidth.	6	- Simulation - Lectures - Tutorials	- Quizzes - Assignment Final exam
2.3	Assess continuous linear time invariant system response, analytically and using different techniques.	6	- Simulation - Lectures - Tutorials	- Reports - Quizzes Final exam
3.0	**Values, autonomy, and responsibility**			
3.1	**xx**	**x**	**xx**	**xx**
3.2	**xx**	**x**	**xx**	**xx**
3.3				

C. Course Content

No	List of Topics	Contact Hours
1.	Motivation, Signal Classifications, Signal Operations, Eigen Functions.	8
2.	Theories of Fourier series for continuous and discrete time signals.	12
3.	Linear circuits and system concepts, impulse response, convolution and transfer function.	12
4.	Frequency response of systems, Fourier Transform with applications	8
5.	Laplace transform and z-transform with applications.	12
6.	Nyquist theorem for sampling of analog signals.	8
	Total	**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Test 1	Week 6	**20**
2.	Test 2	Week 12	**20**
3.	Assignments/ Quizzes	Every chapter	**10**
4.	Final Exam	At the end of the semester as determined by the academic calendar	**50**
5.			
	Sum		**100**

*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	Oppenheim, Willsky and Nawab,"Signals and Systems", Pearson New International Edition 2015.
Supportive References	Signals, Systems, and Transforms, 4th Ed. C. L. Phillips, J. M. Parr, and E. A. Riskin, 2008.
Electronic Materials	Electronically lecture notes provided in e-board.
Other Learning Materials	MATLAB/Simulink

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room for a maximum of 20 students

Items	Resources
Technology equipment (projector, smart board, software)	- Laptops - Data show
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester to identify weaknesses in the course.
Effectiveness of Students assessment	Students	Feedback from Test 1, Test 2, and Final exam records.
Quality of learning resources	Students	A questionnaire is administered at the end of every semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

Course Specification
(Bachelor)

Course Title:	Fundamental of Electronic Devices
Course Code:	215-MRE-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	1
Last Revision Date:	26/1/2026

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A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (3,0,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: 6th/3rd					
4. Course General Description:					
This course introduces students to discrete semiconductor devices. It covers essential topics from basic semiconductor theory through to the application of diodes and transistors. It focuses the P-N junction and the Diode as a circuit element, the Bipolar Junction Transistor (BJT) as a circuit device, the Single stage BJT amplifier circuits, the Junction Field-Effect-Transistor (JFET) and the Metal Oxide Semiconductor Field Effect Transistor (MOSFET) as circuit element.					
5. Pre-requirements for this course (if any):					
212-MRE-3					
6. Co-requisites for this course (if any):					
NA					
7. Course Main Objective(s):					
1. The discrete semiconductor devices. 2. The essential topics from basic semiconductor theory through to the application of diodes and transistors. 3. The P-N junction and the Diode as a circuit element. 4. The Bipolar Junction Transistor (BJT) as a circuit device, the Single stage BJT amplifier circuits. 5. The Junction Field-Effect-Transistor (JFET) and the Metal Oxide Semiconductor Field Effect Transistor (MOSFET) as circuit element.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		45

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Recognize the basic operation and characteristics of a diode and its network applications.	1	Lectures Tutorials	Mid Term1 & 2, Final Exams and Quizzes
1.2	Determine the operation principle, characteristics, configurations and biasing of BJTs	1	Lectures Tutorials	Mid Term1 & 2, Final Exams and Quizzes
1.3	Identify and formulate the operation principle, characteristics, configurations and biasing of JFET and MOSFET.	1	Lectures Tutorials	Mid Term1 & 2, Final Exams and Quizzes
2.0	**Skills**			
2.1	Apply configurations of BJT transistor to design different circuits.	2	Lectures Tutorials	Mid Term1 & 2, Final Exams and Quizzes
2.2	Analyze and perform a small signal AC analysis using different techniques.	6	Lectures Tutorials	Mid Term1 & 2, Final Exams and Quizzes
2.3	Use the techniques, skills, and modern engineering tools such as Multisim simulator to design electronic circuits	2	Lectures Tutorials	- Mini project Report
3.0	**Values, autonomy, and responsibility**			
3.1				

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
3.2				
3.3				

C. Course Content

No	List of Topics	Contact Hours
1.	Semiconductor Materials, Energy Levels, Intrinsic and Extrinsic, Materials —n- and p-Type. PHYSICS OF Semiconductor Electronics.	6
2.	Diode Resistance Levels, Diode Equivalent Circuits Diode Specification Sheets, Zener Diodes, Light-Emitting Diodes (LEDs), Varactor and Photodiode. (Diode Circuits and Applications): Half and Full-Wave Rectification, Zener Diodes, Clippers, Clampers, Gates. Light-Emitting Diodes (LEDs), Varactor and Photodiode.	6
3.	Half and Full-Wave Rectification, Clippers, Clampers, Zener Diodes, Gates.	8
4.	Construction, Operation, Configuration, Limits of Operation, transistor Specification Sheet. Construction, Operation, Characteristics, and Configurations of BJT transistors.	8
5.	Operating Point for Fixed-Bias Circuit, Emitter Bias Circuit, Voltage-Divider Bias and Voltage Feedback. Biasing Circuits of BJT transistors.	4
6.	Fixed-Bias Configuration, Common Emitter Configuration and Voltage-Divider Configuration.	4
7.	Construction, operation, Characteristics of FETs, Bias and Amplifier Circuits Analysis. Construction, operation, Characteristics and Bias of FETs.	6
8.	Small Signal Amplifier analysis using different techniques.	3
	Total	**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Mid Term Exam1	6	20
2.	Mid Term Exam 2	12	20
3.	Mini Project	14	5
4.	Quizzes	Weekly	5
5.	Final exam	End of the semester	50
		Sum	**100**

*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	Electronic Devices and Circuit Theory, Robert L. Boylestad, 11th Edition, 2013, Pearson Education.
Supportive References	Electronic Devices ,Tomas.L.Floyd, 9th Edition, 2011, Prentice Hall Electronic Principles, Albert Malvino and David Bates, 7th Edition, 2006, McGraw-Hill Education.
Electronic Materials	Notes of the concerned instructor on blackboard • http://lib.nu.edu.sa/digitallibbrary.aspx • www. en.wikipedia.org www. allaboutcircuits.com
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room for a maximum of 20 students
Technology equipment (projector, smart board, software)	- Laptops - Data show
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester to identify weaknesses in the course.
Effectiveness of Students assessment	Students	Feedback from Test 1, Test 2, and Final exam records.
Quality of learning resources	Students	A questionnaire is administered at the end of every semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	14470730-1471-00010
DATE	16/1/2026

Course Specification
(Bachelor)

Course Title:	Electronics Lab
Course Code:	333-ELE-1
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	1
Last Revision Date:	26/1/2026

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A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
1 (0,1,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: 6th/3rd					
4. Course General Description:					
This lab performs experimentation in basic electronic circuits and devices: Diodes, transistors (BJT, FET), DC and small signal AC Analysis, Amplifier configurations. It is equipped with basic electronics equipment package such as digital oscilloscopes, DMM, DC power supply units and function generators.					
5. Pre-requirements for this course (if any)**:**					
NA					
6. Co-requisites for this course (if any)**:**					
215-MRE-3					
7. Course Main Objective(s):					
1. Recognize of specification sheets of discrete semiconductor devices , 2. Analyze of Electronic Circuits using semiconductor devices and lab techniques 3. Describe and analyze Zener Diodes, Light-Emitting Diodes (LEDs), Varactor and Photodiode. 4. Analyze of basic Half and Full-Wave Rectification, Clippers, Clampersand Zener Diodes, 5. Categorize Construction, Operation, Configuration, Limits of Operation of transistors, 6. Recognize Transistor Configurations, especially Configuration with Common Emitter 7. Analyze Transistors Biasing configurations: Operating Point for Fixed-Bias Circuit, Emitter Bias Circuit, Voltage-Divider Bias and Voltage Feedback, 8. Recognize and analyze of Small Signal AC Amplifier, **9.** Making use of the equipments and techniques in the laboratory to translate the theory into reality					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		45

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Apply the knowledge of electronics devices in Electrical Engineering applications.	7	- Lab demonstration	- Quizzes - Lab Report - Test 1 Final exam
1.2				
1.3				
2.0	**Skills**			
2.1	Analyze characteristics of Semiconductor Diodes.	6	Lab demonstration	- Quizzes - Lab Report - Test 1 Final exam
2.2	Design Electronic circuits using BJT, FET Op. Amp.	2	Lab demonstration	- Quizzes - Lab Report

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
				- Test 1 Final exam
2.3	Communicate effectively in group discussion.	3	Lab demonstration	- Lab Report Oral Examination
3.0	**Values, autonomy, and responsibility**			
3.1	Work effectively as a member of the team.	5	Lab demonstration	Lab Report
3.2	Recognize ethical and professional responsibilities in engineering situations and make informed judgments	4	- Experiment	- Reports
3.3				

C. Course Content

No	List of Topics	Contact Hours
1.	laboratory Test equipment's: voltage sources, Signal Generators, Oscilloscopes and discrete semiconductor devices	2
2.	Junction-Diode Characteristics	2
3.	Zener-Diode Characteristics	2
4.	Opto-Electronic Devices: LEDs, Photodiodes and Optocouplers	4
5.	Half-Wave and Full-Wave Rectification	4
6.	Transistor input and output characteristics	2
7.	Transistor as an amplifier	4
8.	Transistor as a switch	4
9.	Characteristics of a FET	2
10.	Basic Operational Amplifiers circuits	4
Total		0

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	Random	10
2.	Midterm 1 Exam	Week 6	15
3.	Midterm 2 Exam	Week 12	15
4.	Lab Report	Week 13	5

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
5.	Mini Project	Week 13	5
6.	Final Exam (Practical)	At the end of the semester as determined by the academic calendar	20
7.	Final Exam (Theoretical)	At the end of the semester as determined by the academic calendar	30
	Sum		**100**

*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	Electronic Devices and Circuit Theory, Robert L. Boylestad, 11th Edition, 2013, Pearson Education
Supportive References	Electronic Devices ,Tomas.L.Floyd, 9th Edition, 2011, Prentice Hall Electronic Principles, Albert Malvino and David Bates, 7th Edition, 2006, McGraw-Hill Education
Electronic Materials	Notes of the concerned instructor on blackboard • http://lib.nu.edu.sa/digitallibbrary.aspx • www. en.wikipedia.org www. allaboutcircuits.com
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room for a maximum of 20 students
Technology equipment (projector, smart board, software)	- Laptops - Data show
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester to identify weaknesses in the course.
Effectiveness of	Students	Feedback from Test 1, Test 2, and Final exam records.

Assessment Areas/Issues	Assessor	Assessment Methods
Students assessment		
Quality of learning resources	Students	A questionnaire is administered at the end of every semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

Course Specification
(Bachelor)

Course Title:	Microcontroller and Embedded Systems
Course Code:	220-MRE-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	1
Last Revision Date:	26/1/2026

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G. Specification Approval 6

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (2,1,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: 7th /4th					
4. Course General Description:					
This course covers the main elements of embedded systems design. Emphasis given includes hardware and firmware design, hardware selection, hardware testing, development tools and software, firmware development and firmware debugging.					
5. Pre-requirements for this course (if any)**:**					
210-MRE-3					
6. Co-requisites for this course (if any)**:**					
N/A					
7. Course Main Objective(s):					
After completing this course, the students should be able to: 1. Analyze and design embedded systems.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	30
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		60

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Identify embedded systems and their components and characteristics.	1	- Lectures - Tutorials MATLAB	- Mid Term1 & 2, - Final Exams Quizzes
1.2	Identify Arduino microcontroller	1	- Lectures - Tutorials MATLAB	- Mid Term1 & 2, - Final Exams Quizzes
1.3				
2.0	**Skills**			
2.1	Design embedded systems using Arduino	2	- Lectures - Tutorials MATLAB	- Lab Exam - Assignment - Mini Project - Test 1 Final exam
2.2	Communicate effectively to perform the presentation.	3	- Lectures - Tutorials MATLAB	Presentation
2.3				
3.0	**Values, autonomy, and responsibility**			
3.1	Perform as an effective team-player in executing the related project with imposed design constraints.	5	- Lectures - Tutorials MATLAB	Mini project
3.2	Recognize ethical and professional responsibilities in engineering	4	- Lectures Tutorials	- Mini project - Report

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	situations and make informed judgments			
3.3				

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to embedded systems.	10
2.	Microprocessors and microcontrollers	10
3.	Memory.	8
4.	Interfacing.	8
5.	Introduction to Arduino.	8
6.	Programming using Arduino.	8
7.	Designing embedded systems using Arduino.	8
	Total	**60**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Test 1	Week 6	15
2.	Test 2	Week 12	15
3.	Assignments/Quizzes/ group project and presentation	Every chapter	5
4.	LAB course work	Every Week	15
5.	LAB Final	Week 14	15
6.	Final Exam	At the end of the semester as determined by the academic calendar	35
	Sum		**100**

*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. Embedded System Design: A unified Hardware/Software Introduction, Frank Vahid and Tony Givargis. Wiley. 2001 **2.** Designing Embedded Systems with Arduino, Tianhong Pan and Yi

	Zhu, Springer, 2018
Supportive References	**1.** Ganguly, A.K. (2013). Embedded System: Design, Programming and Applications. Oxford: Alpha Science Intl Ltd. 2. Iniewski, K. (2012). Embedded System: Hardware, Design, and Implementation. New Jersey: John Wiley & Sons. **3.** Sanchez, J. & Canton, M.P. (2012). Embedded Systems Circuits and Programming. Boca Raton: CRC Press
Electronic Materials	http://lib.nu.edu.sa/digitallibbrary.aspx
Other Learning Materials	MATLAB Program.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room for a maximum of 20 students
Technology equipment (projector, smart board, software)	- Laptops - Data show - MATLAB
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester to identify weaknesses in the course.
Effectiveness of Students assessment	Students	Feedback from Test 1, Test 2, and Final exam records.
Quality of learning resources	Students	A questionnaire is administered at the end of every semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**

DATE	**16/1/2026**

Public - عام

Course Specification
(Bachelor)

Course Title:	Mechanics of Materials
Course Code:	232-MRE-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	College of Engineering
Institution:	Najran University
Version:	1.0
Last Revision Date:	21/02/2026

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A. General information about the course:

1. 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: Third Year \ Level 5					
4. Course General Description:					
Concept of Stress at a Point, Principal Stress and Strain due to Combination of Stresses, Torsion: Stress and Strains due to Pure Torsion of Circular Shafts and Hollow Shafts, Power Transmitted by Shafts, Combined Bending & Torsion, Composite Shaft Series Connection. Materials Properties and Testing: Properties in Tension, Shear and Compression, Tension Test, Impact Test, Fatigue Test, Creep test, Hardness Test. Shear Force and Bending Moment, Types of Beams, SF and BM Diagrams for Cantilever, Simply Supported and Overhanging Beams with Point Load, UDL and UVL and their combinations. Deflection of Beams, Simply Supported and Indeterminate Beams, Energy Method, Strain Energy of Beams for Bending and Shearing Stresses, Castigliano's Theorem and calculations of deflection of beams under different conditions. Columns and Struts: Stability, Critical Loads under different end conditions, Euler's and Secant Formulae, Rankine Formula, Design of Columns under Centric and Eccentric Loading					
5. Pre-requirements for this course (if any)**:**					
101 GEC-3 (Statics) and 205 GEC-3 (Dynamics)					
6. Co-requisites for this course (if any)**:**					
NIL					
7. Course Main Objective(s):					
1. Illustrate the concept of point stress due to different types of forces. 2. Illustrate the properties of the materials under different working conditions. 3. Draw the shear force and bending moment diagrams of different beams under					

different loading conditions and know its behaviour.
4. Determine the deflection of beams under different loading conditions and its different governing relations.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	15
5.	**Others (specify)**	
Total		60

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	**Illustrate different types of stress, strain, & load and Draw BMD and SFD for shaft and beams,**	**1**	**TS:1-Interactive lectures using PowerPoint slides TS:2- Engaging the students in problem-based learning through tutorials TS: 3 – Associating the topics in each chapter with the**	**-Test performance evaluation -Evaluation of participation in discussion and group assignments**

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			CLO. TS:4 – Conducting quizzes from each chapter TS:5 – Giving more example programs in the lecture TS: 6 – Discussion with the students in the class hours	
1.2	Develop the skills of idealization of Stress & shaft design and Draw the stress distribution on the thick cylinder	7	TS:1-Interactive lectures using PowerPoint slides TS:2- Engaging the students in problem-based learning through tutorials TS: 3 – Associating the topics in each chapter with the CLO. TS:4 – Giving more assignment from each chapter TS:5 – Giving more example programs in the lecture TS: 6 – Discussion with the students in the class hours	-Test performance evaluation -Evaluation of participation in discussion and group assignments
...				
2.0	Skills			
2.1	Illustrate steps for problems solving with reasoning for each problem solved	2	TS:1-Interactive lectures using PowerPoint slides TS:2- Engaging the students in problem-based	•Locally Developed Exams such as Quiz, Mid & Final Exams with scoring

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			learning through tutorials TS: 3 – Associating the topics in each chapter with the CLO. TS:4 – Conducting quizzes from each chapter TS:5 – Giving more example programs in the lecture TS: 6 – Discussion with the students in the class hours	rubrics ●Assignments involving critical and logical thinking questions ●Quizzes
2.2	Review equations and principles of theorems in mechanics	6	TS:1-Interactive lectures using PowerPoint slides TS:2- Engaging the students in problem-based learning through tutorials TS: 3 – Associating the topics in each chapter with the CLO. TS:4 – Conducting quizzes from each chapter TS:5 – Giving more example programs in the lecture TS: 6 – Discussion with the students in the class hours	●Locally Developed Exams such as Quiz, Mid & Final Exams with scoring rubrics ●Assignments involving critical and logical thinking questions ●Quizzes
...				
3.0	Values, autonomy, and responsibility			
3.1	Solve the problem by working in teams	5	TS:1-Interactive lectures using	Locally Developed

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	and groups.		PowerPoint slides TS:2- Engaging the students in problem-based learning through tutorials TS: 3 – Associating the topics in each chapter with the CLO. TS:4 – Conducting midterm and Final Exam from each chapter TS:5 – Giving more example programs in the lecture TS: 6 – Discussion with the students in the class hours	Exams such as Quiz, Mid & Final Exams with scoring rubrics ●Assignments involving critical and logical thinking questions ●Quizzes

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction – Concept of Stress	8
2.	Stress and Strain – Axial Loading	8
3.	Torsion and Pure Bending	8
4.	Analysis and Design of Beams for Bending	8
5.	Shearing Stresses in Beams and Thin-Walled Members	8
6.	Transformations of Stress and Strain	6
7.	Principle Stresses Under a Given Loading	6
8.	Deflection of Beams	8
Total		60

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	Random	05

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
2.	Midterm 1 Exam	Week 6	15
3.	Midterm 2 Exam	Week 12	15
4.	Lab Report	Week 13	5
5.	Mini Project	Week 13	10
6.	Final Exam (Lab)	At the end of the semester as determined by the academic calendar	20
7.	Final Exam (Lab)	At the end of the semester as determined by the academic calendar	30
8.			
	Sum		**100**

*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. Introduction to Solid Mechanics, I. H. Shames, Prentice Hall of India Pvt. Ltd., 2003
Supportive References	1. Mechanics of Materials, R. C. Hibbeler, Prentice Hall, 8th Edition, 2011 2. Mechanics of Materials, Ferdinand P. Beer et al., McGraw Hill Publications, 6th Edition, 2012
Electronic Materials	Online custom books
Other Learning Materials	NA

2. Required Facilities and equipment

Items	Resources
Facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Classrooms and laboratories**
Technology equipment (projector, smart board, software)	**Projectors**
Other equipment (depending on the nature of the specialty)	**--**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Program Leaders and Peer Reviewer	Direct, Indirect
Effectiveness of Students assessment	Students & Faculty	Direct and Indirect
Quality of learning resources	Students & Faculty	Direct and Indirect
The extent to which CLOs have been achieved	Students & Faculty	Direct and Indirect
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Electrical Engineering Department Council
REFERENCE NO.	14470730-1471-00010
DATE	16/1/2026

Course Specification
(Bachelor)

Course Title:	Mechatronics System Design
Course Code:	242-MRE-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	1
Last Revision Date:	26/1/2026

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A. General information about the course:

1. Course Identification

1. Credit hours: 3(2,1,0) (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: 6th/3rd					
4. Course General Description:					
This course focuses on the design and modeling of complete mechatronic systems using embedded controllers, microprocessors, and system modeling techniques. Students learn to model dynamic systems, develop embedded software, apply control strategies, and design integrated mechatronic solutions through real-world case studies.					
5. Pre-requirements for this course (if any)**:**					
241-MRE-3 (Fundamentals of Mechatronics)					
6. Co-requisites for this course (if any)**:**					
220-MRE-3 Microcontroller and Embedded Systems					
7. Course Main Objective(s):					
At the end of the course, students should be able to: • Design embedded control systems. • Model mechanical, electrical, and electromechanical systems. • Apply control theory to mechatronic systems. • Integrate hardware and software into complete systems. • Analyze system performance and stability. • Develop and evaluate real-world mechatronic designs.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	30
5.	**Others (specify)**	0
Total		60

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Explain the principles of integrated mechatronic system design, including the interaction between mechanical subsystems, electronics, embedded controllers, and control strategies	1	- Class Lectures -	Quizzes, Mid Term Exams, Final Exam
1.2			-	
2.0	**Skills**			
2.1	Design embedded systems using microcontrollers and C programming	2	- Class Lectures - Lab demostration	Quizzes, Mid Term Exams, Final Exam, Lab report
2.2	Model dynamic systems using mathematical and simulation tools	6	- Class Lectures	Quizzes, Mid Term Exams, Final Exam
2.3	Integrate sensors, actuators, and controllers into complete systems	6	- Class Lectures -	Quizzes, Mid Term Exams, Final Exam
2.4	Develop and evaluate a full mechatronic system design	6	- Class Lectures - Group Discussion	Quizzes, Mid Term Exams, Final Exam, Mini Project
2.5	Communicate effectively to perform the presentation.	3	- Class Lectures	Presentation
3.0	**Values, autonomy, and responsibility**			
3.1	Perform as an effective team-player in executing related project with imposed design constraints.	5	Class Lectures Group Discussion	Mini-project

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
3.2				

C. Course Content

No	List of Topics	Contact Hours
1.	Basics of Microprocessors & Microcontrollers	08
2.	Microcontroller Architecture & I/O	10
3.	Embedded Programming	06
4.	System Modeling Concepts	08
5.	Mechanical System Models	08
6.	Electrical & Electromechanical Models	10
7.	Intelligent Systems & AI Basics	06
8.	Mechatronic System Design Methodology	04
9.		
10.		
Total		60

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	Random	05
2.	Midterm 1 Exam	Week 6	15
3.	Midterm 2 Exam	Week 12	15
4.	Mini Project	Week 13	10
5.	Lab report	Week 13	05
6.	Final Exam (Lab)	At the end of the semester as determined by the academic calendar	20
7.	Final Exam (Theory)	At the end of the semester as determined by the academic calendar	30
8.			
Sum			100

*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	W. Bolton., Mechatronics: Electronic Control Systems in Mechanical and Electrical Engineering, , Pearson, 6th edition, 2015.
Supportive References	Nitaigour Mahalik, MECHATRONICS : PRINCIPLES, CONCEPTS AND APPLICATIONS, Wiley, McGraw Hill Education, 2017
Electronic Materials	Youtube channel for condition monitoring concepts
Other Learning Materials	Lecture notes

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room/Lab for a maximum of 25 students
Technology equipment (projector, smart board, software)	- Laptops - Data show
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester to identify weaknesses in the course.
Effectiveness of Students assessment	Students	Feedback from Test 1, Test 2, and Final exam records.
Quality of learning resources	Students	A questionnaire is administered at the end of every semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	14470730-1471-00010
DATE	16/1/2026

Course Specification
(Bachelor)

Course Title:	Numerical Methods
Course Code:	254-MAT-3
Program:	Bachelor of Electrical Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	Version 1
Last Revision Date:	1/1/2025

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A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (3,0,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☒ College	☐ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (5th/3rd)					
4. Course General Description:					
This course introduces the fundamental concepts of numerical methods for solving engineering problems. It emphasizes mathematical modeling, approximation techniques, and computational methods used to analyze real-world engineering challenges. Topics include error analysis, numerical solutions of linear and nonlinear equations, numerical integration and differentiation, interpolation, curve fitting, and numerical solutions of differential equations. The course combines theoretical understanding with practical applications, supported by computational tools like MATLAB or Python.					
5. Pre-requirements for this course (if any)**:**					
204-MAT-3					
6. Co-requisites for this course (if any)**:**					
NA					
7. Course Main Objective(s):					
1. To provide students with foundational knowledge of numerical methods for solving mathematical models in engineering applications. 2. To develop students' proficiency in applying numerical techniques to approximate solutions of algebraic and differential equations. 3. To enhance students' ability to use computational tools for solving complex engineering problems. 4. To promote critical thinking and problem-solving skills through error analysis and result interpretation.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100

No	Mode of Instruction	Contact Hours	Percentage
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		45

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Define the basic concepts and methods of numerical analysis	1	Lectures discussions	- Exams - Assignments - Quizzes
1.2	Solve nonlinear equations and linear systems using numerical methods.	1	Lectures Discussions	- Exams - Assignments - Quizzes
1.3	Approximate the functions with evaluating the errors	1		
1.4	Solve ordinary differential equations using numerical methods	1		
2.0	Skills			
2.1	Work within groups and independently	3	Discussions	Assignments

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
3.0	Values, autonomy, and responsibility			

C. Course Content

No	List of Topics	Contact Hours
1.	Numerical errors: absolute error – relative error – truncation error.	3
2.	Solution of nonlinear equations: Bisection Method, Newton Raphson method, Secant method and fixed-point method.	9
3.	Numerical Solution of linear system: Jacobi method – Gaussian – seidel method.	6
4.	Interpolation: Lagrange interpolation formula, divided differences, Newton interpolation.	12
5.	Numerical differentiation and Numerical integration: Trapezoidal rule - Simpson's rule.	9
6.	Introduction to numerical solutions of ordinary differential equations.	6
Total		45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	First Exam	6	20%
2.	Second Exam	12	20%
3.	Assignments and Quizzes	Open	10%
4.	Final exam	The end of Semester	50%

*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	R. Burden, and J. D. Faires, Numerical Analysis, PWS-Kent Publishers, (2015).10th edition

Supportive References	W. Cheney and D. Kincaid, Numerical Mathematics and Computing, Brooks/Cole Publishing Company, (2003).
Electronic Materials	• http://www.uaemath.com/ar/aforum. • http://www.mathramz.com/xyz/index.php
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	The classroom includes 20 students.
Technology equipment (projector, smart board, software)	Projector. Mathematical Software.
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Student	Student Questionnaire (Indirect)
Effectiveness of student's assessment	Peer Reviewer	Rubrics (Indirect)
Quality of learning resources		
The extent to which CLOs have been achieved	Faculty	Direct
Other		

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

G. Specification Approval Data

COUNCIL /COMMITTEE	
REFERENCE NO.	14470730-1471-00010
DATE	16/1/2026

Course Specification
(Bachelor)

Course Title:	Economics and Engineering Management
Course Code:	308-GEC-3
Program:	Bachelor in Electrical Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	Version 1
Last Revision Date:	1/1/2025

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A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (3,0,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☒ College	☐ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (7th/4th)					
4. Course general Description:					
This course introduces students to fundamental principles of economics and their application in engineering contexts. It emphasizes decision-making, cost analysis, resource allocation, and project management. This course equips students with tools to analyze economic environments, evaluate engineering projects, and implement management strategies effectively.					
5. Pre-requirements for this course (if any)**:**					
NA					
6. Co-requisites for this course (if any)**:**					
NA					
7. Course Main Objective(s):					
After completing this course, the students should be able to: 1. Develop an understanding of economic principles and their role in engineering decision-making. 2. Equip students with knowledge of project management techniques and engineering management principles. 3. Enable students to perform cost-benefit analyses and evaluate the economic feasibility of engineering projects. 4. Foster critical thinking skills to address complex engineering problems from an economic perspective..					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		

No	Mode of Instruction	Contact Hours	Percentage
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		45

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Explain fundamental economic principles and their application in engineering decision-making.	7	- Lectures - Tutorials	- Homework - Quizzes Final exam
1.2	Perform cost analysis, budgeting, and feasibility evaluations for engineering projects.	1	- Lectures - Tutorials	- Homework - Quizzes Final exam
1.3			-	-
2.0				
2.1	Apply project management tools and techniques to plan, organize, and execute engineering tasks effectively.	2	- Lectures - Tutorials	- Homework - Test 1 Final exam
2.2				
3.0	**Values, autonomy, and responsibility**			
3.1	Evaluate the economic and managerial aspects of	4	- Lectures - Tutorials	- Homework - Test 1

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	engineering projects through case studies and real-world applications.			Final exam
3.2				

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Economics and Engineering Management: Basic economic concepts, microeconomics vs. macroeconomics, and the relevance to engineering.	8
2.	Cost Analysis and Budgeting: Fixed and variable costs, break-even analysis, cost estimation in engineering projects.	8
3.	Project Management: Planning, scheduling, and resource management tools such as Gantt charts and Critical Path Method (CPM).	8
4.	Economic Decision Analysis: Time value of money, discounted cash flow analysis, and net present value (NPV) techniques.	7
5.	Sustainability and Engineering Economics: Incorporating environmental and social costs into project evaluation.	7
6.	Case Studies and Applications: Real-world engineering scenarios integrating economic and managerial aspects	7
Total		0

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Test 1	Week 6	16 %
2.	Test 2	Week 12	16 %
3.	Assignments/Quizzes/group project and presentation	Every chapter	18 %
4.	Final Exam	At the end of the semester as determined by the academic calendar	50 %

*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. Blank, L., & Tarquin, A. (2020). Engineering Economy (8th Edition). McGraw-Hill Education. 2. Sullivan, W. G., Wicks, E. M., & Koelling, C. P. (2022). Engineering Economy (17th Edition). Pearson.
Supportive References	1. Meredith, J. R., Mantel, S. J., & Shafer, S. M. (2020). Project Management: A Managerial Approach (10th Edition). Wiley. 2. Newnan, D. G., Lavelle, J. P., & Eschenbach, T. G. (2021). Engineering Economic Analysis (14th Edition). Oxford University Press.
Electronic Materials	1. Engineering Economy Learning Resources: https://www.engineeringeconomy.com 2. Project Management Institute (PMI): https://www.pmi.org
Other Learning Materials	1. Case studies, project reports, and research papers available through the university library and electronic databases. 2. Online lectures and tutorials provided via the course's Learning Management System (LMS).

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room for 20 students.
Technology equipment (projector, smart board, software)	- Laptops - Data show
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching and assessment	Students	- Questionnaire is administered upon completing the course syllabus. - Open discussion for the students during the semester to recognize their weak points in the course. - Feedback from Test 1, Test 2 and Final exam records.
Evaluation of teaching	Peer reviewer	The peer reviewer will monitor a teaching session for assessment by filling in the peer reviewer assessment form.

Assessment Areas/Issues	Assessor	Assessment Methods
Extent of students' achievement of course learning outcomes	Teaching staff	Software program.
Improvement of teaching	Students Peer reviewer	- Learning from students' feedback. - Learning from peer reviewers and department feedback. - Learning/Using various teaching methods (lectures, discussions, workshops, exams). - Learning/Using various teaching mediums (projector, whiteboard, videos, educational visits).
Verifying standards of student achievement	Program leader Independent member teaching staff	Check student's marks by an independent teaching staff member /program leader a sample of student work and remark tests or a sample of assignments.

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	14470730-1471-00010
DATE	16/1/2026

Public - عام

Course Specification
(Bachelor)

Course Title	Fundamentals of Electrical Machines
Course Code:	: 390-MRE-2
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	1
Last Revision Date:	26/1/2026

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A. General information about the course:

1. Course Identification

1. Credit hours: (0)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: $9^{th}/5^{th}$					
4. Course General Description:					
This course introduces the fundamental principles of electromechanical energy conversion and electrical machines with emphasis on applications in mechatronics and robotics systems. The course begins with essential electromagnetic concepts required for machine operation, then covers DC motors, induction motors, synchronous and BLDC motors, stepper and servo motors. The course focuses on: • Torque production mechanisms • Speed–torque characteristics • Simplified modeling for control integration • Motor selection under realistic engineering constraints • Application in robotics and automation systems					
5. Pre-requirements for this course (if any)**:**					
391-MRE-2					
6. Co-requisites for this course (if any)**:**					
7. Course Main Objective(s):					
1. Understand basic electromagnetic principles related to machines. 2. Analyze electromechanical energy conversion. 3. Evaluate characteristics of DC, induction, and servo motors. 4. Apply simplified models for control integration. 5. Select appropriate motors for mechatronic and robotic systems considering realistic constraints and standards.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	30	100

No	Mode of Instruction	Contact Hours	Percentage
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		45

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Explain magnetic circuits, electromagnetic torque production, and the fundamental operating principles of DC, induction, and synchronous motors.	**1**	Interactive lectures, concept discussion, worked examples, visual simulations	Quizzes, Midterm Exam, Final Exam
1.2	Explain magnetic circuits, electromagnetic torque production, and the fundamental operating principles of DC, induction, and synchronous motors.	**1**	Case studies, robotics application examples, class discussion	Homework, Midterm Exam, Final Exam
1.5	Engage in self-learning related to modern motor technologies.	**7**	Independent reading tasks, guided research mini-assignment	Short report, Presentation, Participation
2.0	**Skills**			
2.1	Analyze electrical machines by calculating magnetic flux, induced voltage, electromagnetic torque, torque–speed characteristics, and developing simplified equivalent circuit models.	**6**	Problem-solving sessions, numerical exercises, MATLAB demonstrations	Homework, Midterm Exam, Final Exam
2.2	Select appropriate electrical motors for mechatronic applications based on load requirements, efficiency, safety standards, and realistic engineering constraints.	**6**	Design-based assignment, case study analysis, guided evaluation	Design Assignment, Project Report, Final Exam
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate responsible engineering judgment in motor selection	**4**	Case study discussions, ethical engineering scenarios	Case study discussions, ethical engineering scenarios
3.2				
3.3				

C. Course Content

No	List of Topics	Contact Hours
1.	**Week 1–2: Basic Electromagnetics for Machines** • Magnetic field concepts (B, H) • Magnetic circuits • Faraday's Law • Inductance • Energy conversion principles • Electromagnetic force & torque	4
2.	**Week 3–4: DC Machines** • Construction and principle • Back EMF • Torque equation • Speed control • PMDC motors in robotics	4
3.	**Week 5–7: Induction Motors** • Rotating magnetic field • Slip • Torque-speed characteristics • Simplified equivalent circuit • Automation applications	4
4.	**Week 8–9: Synchronous & BLDC Motors** • Operating principle • Permanent magnet machines • BLDC motors in robotics • Performance comparison	4
5.	**Week 10–11: Stepper and Servo Motors** • Stepper motor operation • Servo motor fundamentals • PWM control concept • Position control integration	4
6.	**Week 12: Motor Drives Overview** • H-bridge concept • Speed control basics • Efficiency considerations	4
7.	**Week 13: Motor Selection** • Load torque calculation • Inertia matching • Thermal limits • Realistic constraints (cost, safety, environment)	4
8.	**Week 14: Case Studies** • Robotic arm motor sizing • Mobile robot drive system • Industrial automation actuator	2
Total		0

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Test 1	Week 6	20
2.	Test 2	Week 12	20
3.	Assignments/ Quizzes	Every chapter	10
4.	Final Exam	At the end of the semester as determined by the academic calendar	50
5.			
	Sum		100

*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	Electric Machinery Fundamentals
Supportive References	Electrical Machinery Fundamentals
Electronic Materials	None
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room for a maximum of 20 students
Technology equipment (projector, smart board, software)	- Laptops - Data show
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester to identify weaknesses in the course.
Effectiveness of Students assessment	Students	Feedback from Test 1, Test 2, and Final exam records.
Quality of learning	Students	A questionnaire is administered at the end of every

Assessment Areas/Issues	Assessor	Assessment Methods
resources		semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

Course Specification
(Bachelor)

Course Title:	Automatic Control
Course Code:	321-MRE-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	1
Last Revision Date:	26/1/2026

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A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (2,1,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: 7th /4th					
4. Course General Description:					
Review of mathematical background (complex variables, Laplace, Diff. Equations); System representation (block diagram, transfer functions, signal flow graph) Modeling of electric and mechanical systems; State variable analysis; Stability; Time domain analysis; Root locus; Frequency domain analysis; Introduction to PID control.					
5. Pre-requirements for this course (if any)**:**					
214-MRE-3					
6. Co-requisites for this course (if any)**:**					
N/A					
7. Course Main Objective(s):					
After completing this course the students should be able to: 1. Represent a system using (block diagram, transfer functions, signal flow graph) 2. Analyze a system both Time domain and Frequency domain 3. Construct the state-space model 4. Evaluate the control system stability.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	30
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		60

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Represent a system using block diagram, transfer functions, signal flow graph.	1	- Class Lectures, MATLAB programming Tutorials	Quizzes, Mid Term Exams, Final Exam
1.2	Identify the control system stability	1	- Class Lectures Tutorials	Quizzes, Mid Term Exams, Final Exam
1.3				
2.0	**Skills**			
2.1	Design a control system both in time domain and frequency domain	2	- Class Lectures Tutorials	Quizzes, Mid Term Exams, Mini-Project Final Exam
2.2	Construct the state-space model	6	Class Lectures Tutorials	Quizzes, Assignment, Mid Term Exam, Final Exam
2.3	Communicate effectively to perform the presentation.	3	Class Lectures Tutorials	Presentation
3.0	**Values, autonomy, and responsibility**			
3.1	Perform as an effective team-player in executing related project with imposed design constraints.	5	Class Lectures Tutorials	Mini-project

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
3.2	Recognize ethical and professional responsibilities in engineering situations and make informed judgments	4	Lectures Tutorials	- Mini project Report
3.3				

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Control Systems	4
2.	Differential Equations of Physical Systems	4
3.	Transfer Function of Linear Systems-Block Diagram Models-Signal Flow Graphs [SFG]	12
4.	State Variable Models- SFG State Models-TF from State Equations-State Transition Matrix	12
5.	Performance of Feedback Control Systems	8
6.	Stability of Linear Feedback Systems	8
7.	Root Locus Technique.	8
8.	Frequency Response Method & Stability in the Frequency Domain.	4
Total		**60**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	Random	5
2.	Assignment	Week 9	1
3.	Mini Project and presentation	Week 13	4
4.	Mid Term 1 Exam	Week 6	20
5.	Mid Term 2 Exam	Week 12	20
6.	Final Exam	End of Semester	50
	Sum		**100**

*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. Modern Control Systems, by Richard C. Dorf and Robert H. Bishop, Pearson Education, 15. October 2013.

Supportive References	1. Modern Control System Theory and Design 2nd edition, Stanley Shinner, Interscience, 1998. 2. Automatic Control Systems, Benjamin Kuo, Prentice-Hall, 2002. 3. Control System Engineering, by Normon S Nise, 2008.
Electronic Materials	Youtube channel for control concepts
Other Learning Materials	Lecture notes

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room for a maximum of 20 students
Technology equipment (projector, smart board, software)	- White Board, Smart Board
Other equipment (depending on the nature of the specialty)	Students use their own Laptops with software Matlab to complete mini project

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester to identify weaknesses in the course.
Effectiveness of Students assessment	Students	Feedback from Test 1, Test 2, and Final exam records.
Quality of learning resources	Students	A questionnaire is administered at the end of every semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

Course Specification
(Bachelor)

Course Title:	Probability and Engineering Statistics
Course Code:	324-STA-3
Program:	Bachelor of Science in Electrical Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	Version 1
Last Revision Date:	1/1/2025

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A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (3,0,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☒ College	☐ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (4th/3rd)					
4. Course General Description:					
This course introduce: Importance of statistics, Presentation and description of statistical data, Measures of central tendency, Measures of dispersion, Variation coefficient, Measures of skewness, Kurtosis Measure, Correlation and regression, Introduction of probability, Random Variables, Probability functions and some significant probability distributions.					
5. Pre-requirements for this course (if any)**:**					
NA					
6. Co-requisites for this course (if any)**:**					
NA					
7. Course Main Objective(s):					
The main objective of this course is providing the knowledge of the basic concepts related to the principles of statistics, probability and random variables theory with the transfer of student from the stage of description to the stage of decision-making and problems solving.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		45

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Know the related basic scientific facts, concepts, principles and techniques in statistics and probability theory.	7	**Lecture discussions**	**Final Exam**
1.2	Described how to handle with data, how to calculate measurements, and understand to the meaning of probability and how to calculate it.			
1.3	Knowing the kinds of random variables, the probability distribution functions and the moments of the random variables.			
1.4	Explain acquire the necessary skills to understand the statistical data in various fields.	1	Lectures discussions	Final Exam
1.5	Prepare of students to the descriptive analysis of statistical data, and draw conclusions and recommendations			
1.6	Demonstrate the ability to deal with the types of random variables and to distinguish			

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	between the deferent problems of random variables and their properties.			
2.0	Skills			
3.0	Values, autonomy, and responsibility			
3.1				

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction(Importance of statistics, Definition of statistics, Statistical data, Sources of data, Methods of data collection, Population and sample, Parameter and statistic)	3
2.	Presentation and description of statistical data (Frequency distributions, Relative frequency, Cumulative frequency distributions, Graphic Presentations, Forms of distributions, Introduction of samples).	5
3.	Measures of central tendency (Arithmetic mean, Geometric mean, harmonic mean, Median, Mode, Approximate relation of the mean, median and mode, Deciles, quartiles and percentiles).	6
4.	Measures of dispersion (Rang, Mid - quartile range, Mean deviation, Variance, Standard deviation).	4
5.	Variation coefficient, Quartile variation coefficient, Measures of skewness (Pearson a coefficient, Quartile skewness coefficient, Percentile skewness coefficient), Kurtosis Measure (or Peakedness), Correlation and regression.	6
6.	Introduction of probability (Principle of counting, Meaning of probability, Basic definitions, Axioms of probability, Relationship between random events, Basic lows, Conditional probability, independent events, Bayes rule, Bayes theorem).	10
7.	Random variables and probability functions, Mathematical expectation, Variance and Probability distributions (Binomial distribution, Poisson distribution and Uniform distribution, Exponential distribution, Normal distribution).	9
8.	Applications on the computer using statistical software	2
	Total	45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Exercises, Homework& Assignments	Open	10%
2.	Midterm exam 1	6th Week	20%
3.	Midterm exam 2	12th Week	20%
4.	Final Exam	16th Week	50%

*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	- Jay L. Devore, Probability and Statistics for Engineering and the Sciences, 9th edition, 2016, Richard Stratton.
Supportive References	- Richard j. and Gouri B., Statistics Principles and Methods, JOHN WILE , SONS, 1985. - R.E Walpole, R.H. Myers, probability and statistics for engineers and scientists, Macmillan publishing 1998. - Mendenhall and Tsincich , statistics for engineers and scientists , prentice Hall , Fourth Edition , 1995.
Electronic Materials	
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom with 30 seats.
Technology equipment (projector, smart board, software)	- Blackboard Platform - Mathematica Program, R Software. - MS. Exace - Projector
Other equipment (depending on the nature of the specialty)	**N/A**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Student	Student Questionnaire (Indirect)
Effectiveness of students' assessment	Peer Reviewer	Rubrics (Indirect)
Quality of learning resources		
The extent to which CLOs have been achieved	Faculty	Direct
Other		

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

G. Specification Approval Data

COUNCIL /COMMITTEE	
REFERENCE NO.	14470730-1471-00010
DATE	16/1/2026

Public - عام

Course Specification
(Bachelor)

Course Title:	Mechanics of Machines
Course Code:	334 MRE-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	College of Engineering
Institution:	Najran University
Version:	1.0
Last Revision Date:	19/02/2026

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A. General information about the course:

1. 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: Third Year \ Level 6					
4. Course General Description:					
Basic Concepts of Mechanisms and Machines: Link, Kinematic Pairs and their Classification, Kinematic Chain, Mechanism and their Inversions, Degree of Freedom, Four Bar Chain and its Inversions. Velocity and Acceleration in Mechanisms, Analytical Method, Relative Velocity and Instantaneous Centre Method, Velocity and Acceleration Diagrams, Klein's Construction for Reciprocating Engine. Kinematic Synthesis of Plane Mechanism: Types, Dimensional and Number Synthesis, Function and Path Generation, Analytical Method of Synthesis: Freudenstein's Equation, Bolch's Synthesis. Gears: Nomenclature, Motion Transmitted by Two Gears, Minimum Number of teeth, Arc and Path of Contact. Gear Trains, Types of Gear Trains, Torques and Tooth Loads in Epicyclic Gear Trains, Power Transmitted through Friction in Belts, Ropes and ClutchesMechanisms					
5. Pre-requirements for this course (if any)**:**					
Mechanics of Materials (232 MRE-3)					
6. Co-requisites for this course (if any)**:**					
7. Course Main Objective(s):					
1. Identify different machine elements and mechanisms. 2. Interpret kinematics and dynamics of different machines and mechanisms. 3. Select suitable drives and mechanisms for a given application. 4. Illustrate the concepts of gears and its nomenclature. 5. Design different types of gear trains and perform power transmission					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	15
5.	**Others (specify)**	
Total		60

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	**Demonstrate and apply principles of kinematics of linkages and their relative motions in practical problems**	**1**	**TS:1-Interactive lectures using PowerPoint slides TS:2- Engaging the students in problem-based learning through tutorials TS: 3 – Associating the topics in each chapter with the CLO. TS:4 – Conducting quizzes from each**	**-Test performance evaluation -Evaluation of participation in discussion and group assignments**

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			chapter TS:5 – Giving more example programs in the lecture TS: 6 – Discussion with the students in the class hours	
1.2	Design of Mechanisms and gear trains for industrial solutions	7	TS:1-Interactive lectures using PowerPoint slides TS:2- Engaging the students in problem-based learning through tutorials TS: 3 – Associating the topics in each chapter with the CLO. TS:4 – Giving more assignment from each chapter TS:5 – Giving more example programs in the lecture TS: 6 – Discussion with the students in the class hours	-Test performance evaluation -Evaluation of participation in discussion and group assignments
...				
2.0	Skills			
2.1	Review and recapitulate in the beginning of class and asking students to recall the contents of previous class	2	TS:1-Interactive lectures using PowerPoint slides TS:2- Engaging the students in problem-based learning through tutorials TS: 3 – Associating	●Locally Developed Exams such as Quiz, Mid & Final Exams with scoring rubrics ●Assignments involving

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			the topics in each chapter with the CLO. TS:4 – Conducting quizzes from each chapter TS:5 – Giving more example programs in the lecture TS: 6 – Discussion with the students in the class hours	critical and logical thinking questions ●Quizzes
2.2	Involving the students to solve problems	6	TS:1-Interactive lectures using PowerPoint slides TS:2- Engaging the students in problem-based learning through tutorials TS: 3 – Associating the topics in each chapter with the CLO. TS:4 – Conducting quizzes from each chapter TS:5 – Giving more example programs in the lecture TS: 6 – Discussion with the students in the class hours	●Locally Developed Exams such as Quiz, Mid & Final Exams with scoring rubrics ●Assignments involving critical and logical thinking questions ●Quizzes
...				
3.0	Values, autonomy, and responsibility			
3.1	Motivating through Group discussions among the students	5	TS:1-Interactive lectures using PowerPoint slides TS:2- Engaging the students in	Locally Developed Exams such as Quiz, Mid & Final Exams

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			problem-based learning through tutorials TS: 3 – Associating the topics in each chapter with the CLO. TS:4 – Conducting midterm and Final Exam from each chapter TS:5 – Giving more example programs in the lecture TS: 6 – Discussion with the students in the class hours	with scoring rubrics ●Assignments involving critical and logical thinking questions ●Quizzes
3.2	Use of technical words related to the course contents for transmitting ideas	4	TS:1-Interactive lectures using PowerPoint slides TS:2- Engaging the students in problem-based learning through tutorials TS: 3 – Associating the topics in each chapter with the CLO. TS:4 – Conducting midterm and Final Exam from each chapter TS:5 – Giving more example programs in the lecture TS: 6 – Discussion with the students in the class hours	Locally Developed Exams such as Quiz, Mid & Final Exams with scoring rubrics ●Assignments involving critical and logical thinking questions ●Quizzes
...				

C. Course Content

No	List of Topics	Contact Hours
1.	Basic Concepts of Mechanisms and Machines: Link, Kinematic Pairs and their Classification	5
2.	Four Bar Chain and its Inversions	5
3.	Velocity and Acceleration in Mechanisms, Analytical Method Relative Velocity and Instantaneous Centre Method	5
4.	Velocity and Acceleration Diagrams	5
5.	Gears: Nomenclature, Motion Transmitted by Two Gears, minimum Number of teeth, Arc and Path of Contact	5
6.	Gears: Nomenclature, Motion Transmitted by Two Gears, Minimum Number of teeth, Arc and Path of Contact.	6
7.	Gear Trains, Types of Gear Trains, Torques and Tooth Loads in Epicyclic Gear Trains	6
8.	Power Transmitted through Friction in Belts, Ropes and Clutches	8
	Total	60

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	Random	05
2.	Midterm 1 Exam	Week 6	15
3.	Midterm 2 Exam	Week 12	15
4.	Lab Report	Week 13	5
5.	Mini Project	Week 13	10
6.	Final Exam (Lab)	At the end of the semester as determined by the academic calendar	20
7.	Final Exam (Lab)	At the end of the semester as determined by the academic calendar	30
8.			
	Sum		100

*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	Theory of Machines by S. S. Rattan, McGraw Hill Publications, 2009

Supportive References	1. Theory of Machines by Thomas Bevan, CBS Publishers and Distributors, 2009 2.Theory of Machines by Ghosh and Mallik, East West Press, 1988
Electronic Materials	Online custom books
Other Learning Materials	NA

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Classrooms and laboratories**
Technology equipment (projector, smart board, software)	--
Other equipment (depending on the nature of the specialty)	--

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Program Leaders and Peer Reviewer	Direct, Indirect
Effectiveness of Students assessment	Students & Faculty	Direct and Indirect
Quality of learning resources	Students & Faculty	Direct and Indirect
The extent to which CLOs have been achieved	Students & Faculty	Direct and Indirect
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Electrical Engineering Department Council
REFERENCE NO.	14470730-1471-00010
DATE	16/1/2026

Public - عام

Course Specification
(Bachelor)

Course Title:	Fundamentals of Engineering Design
Course Code:	390-MRE-1
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	1
Last Revision Date:	26/1/2026

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G. Specification Approval.....6

A. General information about the course:

1. Course Identification

1. Credit hours: (1)					
1 (1,0,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: 8th /4th					
4. Course General Description:					
This course introduces fundamental principles of engineering design. It covers: • Introduction to engineering design • The engineering design cycle • Formulation of practical engineering problems • Customer needs analysis • Brainstorming in design projects • Carrying out a literature survey • Engineering standards (IEEE, IEC) • Realistic constraints in design • Alternative design solutions and trade-off analysis • ABET-based engineering design requirements The course prepares students for the capstone sequence.					
5. Pre-requirements for this course (if any):					
N/A					
6. Co-requisites for this course (if any):					
N/A					
7. Course Main Objective(s):					
1. **To introduce students to the fundamental principles and systematic process of engineering design.** 2. **To develop students' ability to formulate practical engineering problems and analyze customer needs within realistic constraints.** 3. **To enhance students' skills in generating, evaluating, and selecting alternative design solutions using trade-off analysis and relevant engineering standards (e.g., IEEE, IEC).** 4. **To prepare students for capstone design projects by applying ABET-based engineering design requirements and professional practices.**					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	20	44

No	Mode of Instruction	Contact Hours	Percentage
2	E-learning	25	56
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	15
2.	**Laboratory/Studio**	30
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		45

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Explain the engineering design cycle	1	Interactive lectures Case studies Brainstorming workshops Group discussions Mini design exercise	Literature Review Assignment
1.2	Conduct structured literature survey	7		
1.3				
2.0	**Skills**			
2.1	Formulate practical EE problems from real needs	6	Interactive lectures	Literature Review

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
2.2	Analyze customer needs and translate into specifications	6	Case studies Brainstorming workshops Group discussions Mini design exercise	Assignment Customer Needs & Problem Statement Alternative Design Exercise Final Presentation
2.3	Generate alternative design concepts using brainstorming	2		
2.4	Evaluate alternatives considering realistic constraints	6		
3.0	**Values, autonomy, and responsibility**			
3.1	Recognize engineering standards and ethics	5	Interactive lectures Case studies Brainstorming workshops Group discussions Mini design exercise	Literature Review Assignment Customer Needs & Problem Statement Alternative Design Exercise Final Presentation
3.2				
3.3				

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Engineering Design	2
2.	The Engineering Design Cycle	2
3.	Formulation of Practical Engineering Problems	2
4.	Customer Needs Analysis & Specifications	3
5.	Brainstorming & Creativity in Design Projects	2
6.	Carrying out a Literature Survey (IEEE databases)	2
7.	Engineering Standards & Realistic Constraints	2
8.		
Total		**15**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Literature Review Assignment		25
2.	Customer Needs & Problem Statement		25
3.	Alternative Design Exercise		25
4.	Final Presentation		25
5.			
	Sum		**100**

*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	Engineering Design: A Project-Based Introduction – Clive L. Dym, Patrick Little, Elizabeth J. Orwin, & R. Ervin Spjut. *Comprehensive introduction to the engineering design process and project-based learning.*
Supportive References	Engineering Design – George E. Dieter & Linda C. Schmidt. *Covers systematic design, decision-making, constraints, and trade-off analysis.* Product Design and Development – Karl T. Ulrich & Steven D. Eppinger. *Focuses on product planning, customer needs analysis, and concept selection.*
Electronic Materials	ABET resources
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	The department provides the classroom and Lab facilities needed by the students.
Technology equipment (projector, smart board, software)	MATLAB, Pspice, Lab view, ARDUINO
Other equipment (depending on the nature of the specialty)	NA

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester to identify weaknesses in the course.
Effectiveness of Students assessment	Students	Interactive lectures Case studies Brainstorming workshops Group discussions Mini design exercise
Quality of learning resources	Students	A questionnaire is administered at the end of every semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

Course Specification
(Bachelor)

Course Title:	Advance Control
Course Code:	322-MRE-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	1
Last Revision Date:	26/1/2026

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A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (2,1,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: 8th /4th					
4. Course General Description:					
Basics of system modeling and analysis; PID controller design; Transducers and actuators; Real-time control; Control applications (power systems, robotics, etc.), ; Control design project.					
5. Pre-requirements for this course (if any)**:**					
321-MRE-3					
6. Co-requisites for this course (if any)**:**					
N/A					
7. Course Main Objective(s):					
After completing this course, the students should be able to: 1. Define and classify applied control strategies for industrial applications. 2. Analyses of different control methods such as root locus, frequency domain, state space for different electrical and mechanical systems. 3. Analyses of different control methods such as root locus, frequency domain, state space for different electrical and mechanical systems. 4. Model and analyze different electrical and mechanical systems. 5. Compute the PID controller parameters via MATLAB Simulink and control toolbox.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	30
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		60

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
	Define and classify applied control strategies for industrial applications.	1	- Lectures Tutorials	- Quizzes - Test 1 - Final exam
1.2				
1.3				
2.0	**Skills**			
2.1	Analyze different control methods such as root locus, frequency domain for different electrical and mechanical systems.	6	- Lectures Tutorials	- Quizzes - Test 1 - Test 2 - Final exam
2.2	Design of PID, and lead-lag controllers using various control methods.	2	- Lectures Tutorials	- Test 1 - Test 2 - Final exam Mini Project
2.3	Communicate effectively to perform the presentation.	3	- Lectures Tutorials	- Mini Project - Presentation
3.0	**Values, autonomy, and responsibility**			
3.1	Recognize ethical and professional responsibilities in engineering situations and make informed judgments	4	Lectures Tutorials	- Mini project - Reports

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
3.2	Compute the PID controller parameters via MATLAB Simulink and control toolbox	5	Computer programming tools (MATLAB)	Mini project
3.3				

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to control and its industrial applications.	8
2.	Modeling and analysis of dynamic models of different systems such as mechanical and electrical systems including models of motor position and speed, and cruise control systems.	12
3.	Analyze different control methods such as root locus, frequency domain, state-space for different electrical and mechanical systems.	12
4.	Design of PID, and lead-lag control strategies.	12
5.	Introduction of Programming Logic Controller (PLC).	12
6.	MATLAB for control applications	4
7.		
8.		
Total		60

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	Random	10
2.	Midterm 1 Exam	Week 6	15
3.	Midterm 2 Exam	Week 12	15
4.	Lab Report	Week 13	5
5.	Mini Project	Week 13	5
6.	Final Exam (Practical)	At the end of the semester as determined by the academic calendar	20
7.	Final Exam (Theoretical)	At the end of the semester as determined by the academic calendar	30
Sum			100

*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.** Modern control systems. Richard C. Dorf, Robert H. Bishop. 13th ed. 2016.
Supportive References	**1.** Katsuhiko Ogata, "Modern Control Engineering", Prentice Hall 2010.
Electronic Materials	http://lib.nu.edu.sa/digitallibbrary.aspx
Other Learning Materials	MATLAB Program.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room for a maximum of 20 students
Technology equipment (projector, smart board, software)	- Laptops - Data show - MATLAB
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester to identify weaknesses in the course.
Effectiveness of Students assessment	Students	Feedback from Test 1, Test 2, and Final exam records.
Quality of learning resources	Students	A questionnaire is administered at the end of every semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**

DATE	**16/1/2026**

Course Specification
(Bachelor)

Course Title:	Programmable Logic Controllers
Course Code:	324-MRE-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	1
Last Revision Date:	26/1/2026

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A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (2,1,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: 8th /4th					
4. Course General Description:					
The course will provide topics such as Review of Virtual Instrumentation, Data-flow Techniques, VI Programming Techniques, Data Acquisition Basics, Common Instrumentation Interfaces, Use of Analysis Tools, System buses, Interface buses.					
5. Pre-requirements for this course (if any)**:**					
220-MRE-3					
6. Co-requisites for this course (if any)**:**					
N/A					
7. Course Main Objective(s):					
The objective of this course is to give introduction to programmable logic controllers (PLCs), process control algorithms, PLC programming techniques, interfacing of sensors and other I/O devices, simulation and networking, Design PLC based system for process control, and PLC applications.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	30
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		60

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Demonstrate knowledge of programmable logic controllers	1	- Class Lectures, Tutorials	Quizzes, Mid Term Exams, Final Exam
1.2	Demonstrate knowledge of process control systems	1	- Class Lectures, Tutorials	Quizzes, Mid Term Exams, Final Exam
1.3				
2.0	**Skills**			
2.1	Design PLC based system for process control	2	- Class Lectures Tutorials	Quizzes, Mid Term Exams, Mini-Project Final Exam
2.2	Program using ladder logic programming of software	6	- Class Lectures Tutorials	Quizzes, Mid Term Exams, Mini-Project Final Exam
2.3	Communicate effectively to perform the presentation.	3	Class Lectures, Group Discussion	Mini-project Presentation
3.0	**Values, autonomy, and responsibility**			
3.1	Perform as an effective team-player in executing related project with imposed design constraints.	5	Class Lectures, Group Discussion	Mini-project
3.2				
3.3				

C. Course Content

No	List of Topics	Contact

		Hours
1.	Introduction to Programmable Logic Controllers (PLCs) and its architecture	08
2.	Input/output modules, power supplies, opto isolation and memory map	08
3.	Siemens Instruction Set	08
4.	Addressing considerations for PLC processors	08
5.	Ladder logic programming including combinational logic, branching and other rung conditions	08
6.	Timers, counters, fault and interrupt systems in PLC	08
7.	Design a PLC based process control system, its software/hardware design	08
8.	Industrial applications of PLC	04
Total		**60**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	Random	10
2.	Midterm 1 Exam	Week 6	15
3.	Midterm 2 Exam	Week 12	15
4.	Lab Report	Week 13	5
5.	Mini Project	Week 13	5
6.	Final Exam (Practical)	At the end of the semester as determined by the academic calendar	20
7.	Final Exam (Theoretical)	At the end of the semester as determined by the academic calendar	30
	Sum		**100**

*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.** Max Rabiee., Programmable Logic Controllers: Hardware and Programming, Goodheart-Willcox, , 5th edition, 2021.
Supportive References	**1.** Eman Kamel, Khaled Kamel, Hands-On PLC Programming with RSLogix 500 and LogixPro, McGraw Hill, 1st Edition, 2016.
Electronic Materials	Youtube channel for PLC concepts
Other Learning Materials	Lecture notes

2. Required Facilities and equipment

Items	Resources
facilities	Classroom, Lab

Items	Resources
(Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	
Technology equipment (projector, smart board, software)	- White Board, Smart Board
Other equipment (depending on the nature of the specialty)	Siemens PLC Hardware and Software

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester to identify weaknesses in the course.
Effectiveness of Students assessment	Students	Feedback from Test 1, Test 2, and Final exam records.
Quality of learning resources	Students	A questionnaire is administered at the end of every semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

Public - عام

Course Specification
(Bachelor)

Course Title:	Hydraulics and Pneumatics
Course Code:	331-MRE-2
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	College of Engineering
Institution:	Najran University
Version:	1.0
Last Revision Date:	20/02/2026

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A. General information about the course:

1. Course Identification

1. Credit hours: 2 (2,0,0)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (Fifth Year \ Level 9)					
4. Course General Description:					
This course aims to provide students a vision of applying hydraulic and pneumatuic forces in moving or manipulating objects in industrial use. Though this can be done by electrically as well yet use of hydraulics and pneumatics in some conditions are more simple and economic. This will give an insight into the components and operation of a pneumatic or hydraulic system and also find the faults and its maintenance in the given system.					
5. Pre-requirements for this course (if any)**:**					
230-MRE-3 (FLUID MECHANICS)					
6. Co-requisites for this course (if any)**:**					
NIL					
7. Course Main Objective(s):					
1. Develop the understanding of hydraulic system with its control mechanism. 2. Develop the understanding of pneumatic system with its control mechanism. 3. Develop familiarity with the design and analysis of a hydraulic and pneumatic system and its functioning. 4. Develop sense of safety and expertise while working with hydraulic and pneumatic components and their fault and maintenance.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100%
2	E-learning		

No	Mode of Instruction	Contact Hours	Percentage
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		30

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Learning and applying the basic laws of physics in association with hydraulics and pneumatics and develop mechatronics system.	1	TS:1-Interactive lectures using PowerPoint slides TS:2- Engaging the students in problem-based learning through tutorials TS: 3 – Associating the topics in each chapter with the CLO. TS:4 – Conducting quizzes by the each chapter TS:5 – Giving more example programs in the lecture TS: 6 – Discussion with the students	-Test performance evaluation -Evaluation of participation in discussion and group assignments -Written Assessment.

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			in the class hours	
1.2	Learn to use the hydraulic and pneumatic valves and actuators in mechatronic systems.	1	TS:1-Interactive lectures using PowerPoint slides TS:2- Engaging the students in problem-based learning through tutorials TS: 3 – Associating the topics in each chapter with the CLO. TS:4 – Giving more assignment by the each chapter TS:5 – Giving more example programs in the lecture TS: 6 – Discussion with the students in the class hours	-Test performance evaluation -Evaluation of participation in discussion and group assignments -Practical Assessment
2.0	**Skills**			
2.1	Develop the skill of detecting fault and its maintenance following safety regulations in the mechatronic system.	6	TS:1-Interactive lectures using PowerPoint slides TS:2- Engaging the students in problem-based learning through tutorials TS: 3 – Associating the topics in each chapter with the CLO. TS:4 – Conducting quizzes by the each chapter TS: 5 – Discussion with the students in the class hours	•Locally Developed Exams such as Quiz, Mid & Final Exams with scoring rubrics •Assignments involving critical and logical thinking questions •Quizzes

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.2	Involving students to solve problems with practical use in mechatronic system design.	2	TS:1-Interactive lectures using PowerPoint slides TS:2- Engaging the students in problem-based learning through tutorials TS: 3 – Associating the topics in each chapter with the CLO. TS:4 – Conducting quizzes by the each chapter TS: 5 – Discussion with the students in the class hours	•Locally Developed Exams such as Quiz, Mid & Final Exams with scoring rubrics •Assignments involving critical and logical thinking questions •Quizzes
3.0	**Values, autonomy, and responsibility**			
3.1	Develop a sense of responsibility in designing user friendly and cost effective systems while working in a collaborative team of different streams.	5	TS:1-Interactive lectures using PowerPoint slides TS:2- Engaging the students in problem-based learning through tutorials TS: 3 – Associating the topics in each chapter with the CLO. TS:4 – Conducting midterm and Final Exam by the each chapter TS:5 – Giving more example programs in the lecture TS: 6 – Discussion with the students in the class hours	Locally Developed Exams such as Quiz, Mid & Final Exams with scoring rubrics •Assignments involving critical and logical thinking questions •Quizzes

C. Course Content

No	List of Topics	Contact Hours
1.	**Fundamental Principles:** Industrial Prime Movers, Brief comparison of systems, definitions, Pascal's Law, Pressure Measurement, Fluid Flow, Temperature, Gas Laws	**2**
2.	**Hydraulic Pumps and Pressure Regulation**	**3**
3.	**Air Compressors and Pressure Regulation**	**5**
4.	**Control Valves and Actuators for hydraulic and pneumatic applications**	**5**
5.	**Hydraulic and Pneumatic accessories**	**5**
6.	**Process Control Pneumatics**	**5**
7.	**Sequencing Applications, Safety, Fault Finding and Maintenance**	5
Total		0

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Test 1	Week 6	20 %
2.	Test 2	Week 12	20 %
3.	Assignments/Quizzes/group project and presentation	Every chapter	10 %
4.	Final Exam	At the end of the semester as determined by the academic calendar	50 %
Sum			**100**

*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	Andrew Parr, "Hydraulics and Pneumatics: A Technician's and Engineeri's Guide", Third Edition, Butterworth-Heinemann (Elsevier) Publication, 2011.
Supportive References	Jagadeesha, T, "Hydraulics and Pneumatics", Wiley Publications, 2019
Electronic Materials	NA
Other Learning Materials	NA

2. Required Facilities and equipment

Items	Resources
Facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms and laboratories
Technology equipment (projector, smart board, software)	**Projector**
Other equipment (depending on the nature of the specialty)	**--**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Program Leaders and Peer Reviwer	Direct and Indirect
Effectiveness of Students assessment	Students&Faculty	Direct and Indirect
Quality of learning resources	Students&Faculty	Direct and Indirect
The extent to which CLOs have been achieved	Students&Faculty	Direct and Indirect
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	14470730-1471-00010
DATE	16/1/2026

Course Specification
(Bachelor)

Course Title:	Robotics
Course Code:	333-MRE-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	1
Last Revision Date:	26/1/2026

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A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (2,1,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: 8th /4th					
4. Course General Description:					
This course provides an overview of the robotics, basic elements of the robot, basics of the robot design, programming and vision in robotics and applications of robots in biomedical, deep water and manufacturing.					
5. Pre-requirements for this course (if any)**:**					
321-MRE-3					
6. Co-requisites for this course (if any)**:**					
N/A					
7. Course Main Objective(s):					
After completing this course, the students should be able to: 1. Identify the robotic elements and spatial description & transformations. 2. To learn the fundamentals and design of robots. 3. To be familiar with applications of robotics in the industry. 4. Design and simulate robots of various degrees of freedom.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	30
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		60

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Identify the main element of robot design	1	Lectures	- Mid Exam 1 - Quiz Final exam
1.2	Identify the spatial description and transformations	1	Lectures	- Mid Exam 1 - Quiz Final exam
1.3				
2.0	**Skills**			
2.1	Design kinematic and dynamic response of robotic systems	2	Lectures	- Mid Exam 1 - Mid Exam 2 - Final exam Mini Project
2.2	Simulate robots of various degrees of freedom	6	Lab demonstration & simulation	- Lab Report - Quiz Final Exam
2.3	Communicate effectively to perform the presentation.	*3*	- Lectures - Simulation	Mini Project Presentation
3.0	**Values, autonomy, and responsibility**			
3.1	Perform as an effective team-player in executing related project with imposed design constraints.	*5*	- Lectures - Simulation	Mini Project
3.2				
3.3				

C. Course Content

No	List of Topics	Contact Hours
1.	An overview of robots	2
2.	Spatial description and transformations	6
3.	Robot manipulator kinematics	6
4.	Robot manipulator dynamics	6
5.	Velocity and torque parameters	4
6.	Manipulator-mechanism design	4
7.	Modern trends and applications of robots	2
8.	Robot Simulations	30
	Total	**60**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	Random	10
2.	Midterm 1 Exam	Week 6	15
3.	Midterm 2 Exam	Week 12	15
4.	Lab Report	Week 13	5
5.	Mini Project	Week 13	5
6.	Final Exam (Practical)	At the end of the semester as determined by the academic calendar	20
7.	Final Exam (Theoretical)	At the end of the semester as determined by the academic calendar	30
	Sum		**100**

*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.** Introduction to Robotics, mechanics and control by John J. Graig, Pearson, 4th Edition, 2017.
Supportive References	1. Saha, S.K., Introduction to Robotics, 2nd Edition, 2014, Tata McGraw-Hill. 2. Introduction to Robotics by P. J. McKerrow, Edition 2008, Wiley. 3. Introduction to AI Robotics by R. R. Murphy, Edition 2000, MIT Press.
Electronic Materials	http://lib.nu.edu.sa/digitallibbrary.aspx
Other Learning Materials	- MATLAB Program.

	Robot design and application videos from YouTube

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom, Lab
Technology equipment (projector, smart board, software)	- Laptops - Data show - MATLAB
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester to identify weaknesses in the course.
Effectiveness of Students assessment	Students	Feedback from Test 1, Test 2, and Final exam records.
Quality of learning resources	Students	A questionnaire is administered at the end of every semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

Public - عام

Course Specification
(Bachelor)

Course Title:	Mechanical Engineering Design (1)
Course Code:	335 MRE-2
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	College of Engineering
Institution:	Najran University
Version:	1.0
Last Revision Date:	07/6/2025

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A. General information about the course:

1. Course Identification

1. Credit hours: 2(2,0,0) (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: Third Year \ Level 6					
4. Course General Description:					
Introduction to Design Process & Phases of Design, Design Factors, Margin of Safety, Working Stresses, Theories of Failures Design against Fatigue, Factors affecting Fatigue, Stress Concentration, Notch Sensitivity, Practical Measures to Combat Fatigue Design of Screw Joints under Tension and Shear, Eccentrically Loaded Screws, Friction and Efficiency Springs: Types of Springs, Tension and Compression Springs, Design of Helical Spring, Leaf Spring, Combination in Series and Parallel					
5. Pre-requirements for this course (if any):					
213-MEC-3(Mechanics of Materials)					
6. Co-requisites for this course (if any):					
NIL					
7. Course Main Objective(s):					
1. Identify the different stages of designing machine components. 2 Design against different loading conditions such as fatigue and stress concentration. 3. Design different types of key and cotter joints under different loading conditions. 4. Design the different brakes, clutches and springs for moving machinery. 5. Design various types of pressure vessels for different work conditions					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	E-learning		

No	Mode of Instruction	Contact Hours	Percentage
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		60

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	**Demonstrate various aspects of fundamentals of Design and Develop a practical understanding of Machine and Designing of Machine Elements**	**1**	**TS:1-Interactive lectures using PowerPoint slides** **TS:2- Engaging the students in problem-based learning through tutorials** **TS: 3 – Associating the topics in each chapter with the CLO.** **TS:4 – Conducting quizzes from each chapter**	**-Test performance evaluation** **-Evaluation of participation in discussion and group assignments**

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			TS:5 – Giving more example programs in the lecture TS: 6 – Discussion with the students in the class hours	
1.2	In the present state of the art technology, it is of prime importance to use mathematical modeling and software for designing Machine Elements	7	TS:1-Interactive lectures using PowerPoint slides TS:2- Engaging the students in problem-based learning through tutorials TS: 3 – Associating the topics in each chapter with the CLO. TS:4 – Giving more assignment from each chapter TS:5 – Giving more example programs in the lecture TS: 6 – Discussion with the students in the class hours	-Test performance evaluation -Evaluation of participation in discussion and group assignments
...				
2.0	**Skills**			
2.1	Ability to think critically and analytically and to develop tests in the areas covered at different levels.	6	TS:1-Interactive lectures using PowerPoint slides TS:2- Engaging the students in problem-based learning through tutorials TS: 3 – Associating the topics in each	•Locally Developed Exams such as Quiz, Mid & Final Exams with scoring rubrics •Assignments involving critical and

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			chapter with the CLO. TS:4 – Conducting quizzes from each chapter TS: 5 – Discussion with the students in the class hours	logical thinking questions ●Quizzes
2.2	Ability to produce test items in areas studied, to retain information by understanding material and Decrease dependence on memorization	2	TS:1-Interactive lectures using PowerPoint slides TS:2- Engaging the students in problem-based learning through tutorials TS: 3 – Associating the topics in each chapter with the CLO. TS:4 – Conducting quizzes from each chapter TS: 5 – Discussion with the students in the class hours	●Locally Developed Exams such as Quiz, Mid & Final Exams with scoring rubrics ●Assignments involving critical and logical thinking questions ●Quizzes
...				
3.0	Values, autonomy, and responsibility			
3.1	complete all assignments in due time and also participate in class discussion and think critically	4	TS:1-Interactive lectures using PowerPoint slides TS:2- Engaging the students in problem-based learning through tutorials TS: 3 – Associating the topics in each chapter with the CLO.	Locally Developed Exams such as Quiz, Mid & Final Exams with scoring rubrics ●Assignments involving critical and logical thinking questions

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			TS:4 – Conducting midterm and Final Exam from each chapter TS:5 – Giving more example programs in the lecture TS: 6 – Discussion with the students in the class hours	●Quizzes
3.2	Communicate, listen, negotiate, and evaluate their strengths and weaknesses as members of a team And defend their points of view and/or proposed solution to any problem based on the acquired knowledge.	3	TS:1-Interactive lectures using PowerPoint slides TS:2- Engaging the students in problem-based learning through tutorials TS: 3 – Associating the topics in each chapter with the CLO. TS:4 – Conducting midterm and Final Exam from each chapter TS:5 – Giving more example programs in the lecture TS: 6 – Discussion with the students in the class hours	Locally Developed Exams such as Quiz, Mid & Final Exams with scoring rubrics ●Assignments involving critical and logical thinking questions ●Quizzes
3.3	Description of the interpersonal skills and capacity to carry responsibility to be Developed	5	TS:1-Interactive lectures using PowerPoint slides TS:2- Engaging the students in problem-based learning through tutorials	Locally Developed Exams such as Quiz, Mid & Final Exams with scoring rubrics ●Assignments

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			TS: 3 – Associating the topics in each chapter with the CLO. TS:4 – Conducting midterm and Final Exam from each chapter TS:5 – Giving more example programs in the lecture TS: 6 – Discussion with the students in the class hours	involving critical and logical thinking questions ●Quizzes

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Design Process & Phases of Design, Design Factors, Margin of Safety, Working Stresses, Theories of Failures	8
2.	Design against Fatigue, Factors affecting Fatigue, Stress Concentration, Notch Sensitivity, Practical Measures to Combat Fatigue	8
3.	Design of Screw Joints under Tension and Shear, Eccentrically Loaded Screws, Friction and Efficiency	8
4.	Springs: Types of Springs, Tension and Compression Springs, Design of Helical Spring, Leaf Spring, Combination in Series and Parallel	6
Total		30

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Test 1	Week 6	20 %
2.	Test 2	Week 12	20 %
3.	Assignments/Quizzes/group project and presentation	Every chapter	10 %
4.	Final Exam	At the end of the semester as	50 %

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
		determined by the academic calendar	
		Sum	**100**

*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. Mechanical Engineering Design by J. E. Shigley, C. R. Mischke, Tata McGraw Hill Publications. 2015**
Supportive References	**1.Machine Design by Paul H. Black and O. Eugene Adams, Auckland, McGraw hill Publications, 1968** **2.Design of Machine Elements by V. B. Bhandari, Tata McGraw Hill Publications, 2010**
Electronic Materials	**Online custom books**
Other Learning Materials	**NA**

2. Required Facilities and equipment

Items	Resources
Facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Classrooms and laboratories**
Technology equipment (projector, smart board, software)	**--**
Other equipment (depending on the nature of the specialty)	**--**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of Students assessment	Students & Faculty	Direct, Indirect
Quality of learning resources	Students & Faculty	Direct and Indirect
The extent to which CLOs have been achieved	Students & Faculty	Direct and Indirect
Other		Direct and Indirect

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	14470730-1471-00010
DATE	16/1/2026

Course Specification
(Bachelor)

Course Title:	Engineering Applications of Artificial Intelligence
Course Code:	344-MRE-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	1
Last Revision Date:	26/1/2026

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G. Specification Approval 6

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (2,1,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: 8th /4th					
4. Course General Description:					
To introduce to the basic concepts of Artificial Intelligence, with illustrations of current applications in engineering.					
5. Pre-requirements for this course (if any)**:**					
205-MRE-3					
6. Co-requisites for this course (if any)**:**					
N/A					
7. Course Main Objective(s):					
This course has following objectives: 1. Introduction to Artificial Intelligence (AI) 2. Exhibit strong familiarity with a number of important AI techniques. 3. Build awareness of AI facing major challenges and the complexity of typical problems within the field 4. Understand the fundamental of ANN, its need, advantages and limitations. 5. To learn methods to solve problems using ANN.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	30
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		60

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Introduction to Artificial Intelligence	1	- Class Lectures, Tutorials	Quizzes, Mid Term Exams, Final Exam
1.2	Ability to apply the AI to solve engineering problems	7	- Class Lectures, Tutorials	Quizzes, Mid Term Exams, Final Exam
1.3				
2.0	**Skills**			
2.1	Interpret and the Evaluate the structure of various ANN algorithms	6	- Class Lectures, Tutorials	, Mid Term, Exams, Final Exam
2.2	Design of ANN algorithms in Matlab/Python	2	- Class Lectures, Tutorials	Mini-Project, , Final Exam
2.3				
3.0	**Values, autonomy, and responsibility**			
3.1	Perform as an effective team-player in executing related project with imposed design constraints.	5	Class Lectures	Mini-project
3.2	Communicate effectively to perform the presentation.	3	Class Lectures	Presentation
3.3				

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Artificial Intelligence	10
2.	Knowledge Representation & Reasoning	10
3.	Probabilistic reasoning	10
4.	Fundamentals of Artificial Neural Network	10
5.	Learning Processes and Design	10
6.	Supervised and Unsupervised Learning	10
7.		
8.		
Total		60

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	Random	10
2.	Midterm 1 Exam	Week 6	15
3.	Midterm 2 Exam	Week 12	15
4.	Lab Report	Week 13	5
5.	Mini Project	Week 13	5
6.	Final Exam (Practical)	At the end of the semester as determined by the academic calendar	20
7.	Final Exam (Theoretical)	At the end of the semester as determined by the academic calendar	30
Sum			100

*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. Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern Approach, 2nd edition, Prentice Hall of India, 2004.
Supportive References	1. Michael Negnevitsky Artificial Intelligence: A Guide to Intelligent Systems, 3rd Edition, 2001 2. Satish Kumar, Neural Networks: A Classroom Approach, Tata McGraw Hill, 2004.
Electronic Materials	Youtube channel for AI concepts
Other Learning Materials	Lecture notes

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom, Lab
Technology equipment (projector, smart board, software)	- Laptops - Data show
Other equipment (depending on the nature of the specialty)	Students use their own Laptops to complete mini project

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester to identify weaknesses in the course.
Effectiveness of Students assessment	Students	Feedback from Test 1, Test 2, and Final exam records.
Quality of learning resources	Students	A questionnaire is administered at the end of every semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

Public - عام

Course Specification
(Bachelor)

Course Title:	Graduation Project I
Course Code:	391-MRE-2
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	1
Last Revision Date:	26/1/2026

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A. General information about the course:

1. Course Identification

1. Credit hours: (2)					
2 (1,2,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: 8th /4th					
4. Course General Description:					
The graduation project is a culminating handy course work for which the students are expected to integrate and apply what they have learned through previous academic work and field experiences, with faculty supervision. These projects may be "new," continuation of work done in previous courses; or may be projects started in a previous course that become significantly expanded and enhanced for the thesis. It has two phases- to be taken in consecutive two semesters at senior level. At the beginning of the semester, the students propose a topic on which they are supposed to work as a group. Project students meet in class weekly, discuss their research, and screen their progresses for peer and faculty critique and suggestions. At the end of the semester, students present their thesis projects to the supervising committee.					
5. Pre-requirements for this course (if any)**:**					
321-MRE-3 and 308-GEC-3 or Complete 120 Credit Hours out of 161 Credit Hours					
6. Co-requisites for this course (if any)**:**					
N/A					
7. Course Main Objective(s):					
T After completing this course, the students should be able to: 1. Ability to formulate design project and manage it. 2. Ability to review related data and knowledge from credible sources. 3. Ability to communicate orally and to report technically.To learn methods to solve problems using ANN.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	20	44
2	E-learning	25	56
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	15
2.	**Laboratory/Studio**	30
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		45

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Review the available literature in the project domain.	7	Discussion rounds, homework, assignments	- Discussion, presentation
1.2	Identify and formulate engineering problems in the area of Mechatronics and Robotics engineering	1	discussion rounds, homework, assignments	- Discussion, presentation
1.3				
2.0	**Skills**			
2.1	Design a system, component or process with defined constraints.	2	- Lectures - Discussion rounds Tutorials	- Presentation Final Report Draft
2.2	Solve engineering problems and implement designed solution	2	- Lectures - Discussion rounds	- Log book - Presentation

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
			Tutorials	Final Report Draft
2.3	Communicate effectively in written engineering report and in oral presentation	3	discussion rounds, homework, tutorials, assignments	Discussion, presentation
3.0	**Values, autonomy, and responsibility**			
3.1	Work effectively as a member of the team	5	discussion rounds, homework, assignments	Discussion, presentation
3.2	Plan a project effectively using project-planning techniques to ensure proper timing, budgeting and professional ethics.	4	discussion rounds, homework, assignments	Discussion, presentation
3.3				

C. Course Content

No	List of Topics	Contact Hours
1.	Choose a project and write a proposal.	5
2.	Initial Student Presentations: project title, description, motivation and aims.	6
3.	Project planning, process, management activities, work breakdown, time estimation, milestones, activity sequencing, activity network, scheduling, Gantt charts and re-planning.	8
4.	Literature survey: search and review, tracing the information, critical evaluation, writing literature review, ethics and responsibilities.	6
5.	Software development, life cycle, models, assistance in writing the progress report	6
6.	Student presentations: project proposal: problem definition, objectives, justification, and approach.	6
7.	Final presentation & final report (committee)	8
8.		
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Logbook (supervisor)	Every week	10
2.	Final Report Draft (supervisor)	Week 13	30
3.	Mid Term Presentation	Week 14	20
4.	Presentation (examination panel)	Week 14	15
5.	Final Report Draft (examination panel)	Week 14	25
	Sum		**100**

*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	Any available books in the library related to project work.
Supportive References	The students review the literature of the project from Published research articles.
Electronic Materials	Youtube channel for project concepts
Other Learning Materials	The work is done by the students on the software related to the project (like MATLAB, Pspice, Lab view, ARDUINO)

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	The department provides the classroom and Lab facilities needed by the students.
Technology equipment (projector, smart board, software)	MATLAB, Pspice, Lab view, ARDUINO
Other equipment (depending on the nature of the specialty)	NA

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester to identify weaknesses in the course.
Effectiveness of	Students	Feedback from Test 1, Test 2, and Final exam records.

Assessment Areas/Issues	Assessor	Assessment Methods
Students assessment		
Quality of learning resources	Students	A questionnaire is administered at the end of every semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

Course Specification
(Bachelor)

Course Title:	Industrial Automation
Course Code:	435-MRE-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	1
Last Revision Date:	26/1/2026

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G. Specification Approval 6

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (3,0,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: 9th /5th					
4. Course General Description:					
Industrial and specially Manufacturing Automation, Automation Theory; Computer Numerical Control (CNC) Machining Requirements, Limitations of Conventional Machining, Introduction of Numerical Control, Building blocks of CNC, CNC Programming, Machining Codes, Sensors/actuators/control cards used in CNC machines; Introduction to PLC, PLC Architecture and Operation, Advantages / Limitations of PLC, Ladder Logic and other Programming Formats, Relay Logic, Timers, Counters, Comparator, Math Instructions, Bit Shift Registers, Advanced instructions, industrial data communication protocols.					
5. Pre-requirements for this course (if any)**:**					
322-MRE-3 and 333-MRE-3					
6. Co-requisites for this course (if any)**:**					
N/A					
7. Course Main Objective(s):					
The course covers industrial automation with particular reference to CNC and PLC. After this course, the students would be able to understand the automation requirements of a modern industrial set-up.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	60
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		60

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	An ability to differentiate between conventional machine and CNC machines	1	- Class Lectures, Tutorials	Quizzes, Mid Term Exams, Final Exam
1.2	Identify the components of industrial automation systems	1	- Class Lectures, Tutorials	Quizzes, Mid Term Exams, Final Exam
1.3				
2.0	**Skills**			
2.1	Design different type of programs and codes using CNC Machines	2	Class Lectures	Quizzes, Mid Term Exams, Final Exam
2.2	Design and analyze mechatronics system control using PLC	6	Class Lectures	Quizzes, Mid Term Exams, Mini-Project Final Exam
2.3				
3.0	**Values, autonomy, and responsibility**			
3.1	Perform as an effective team-player in executing related project with imposed design constraints.	5	Class Lectures	Mini-project
3.2	Communicate effectively to perform the presentation.	3	Class Lectures	Presentation
3.3				

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Industrial Automation	10
2.	Components of Industrial Automation System	06
3.	Basics of CNC Machines	08
4.	Building blocks of CNC Machines	10
5.	PLC Architecture and Operation	06
6.	Ladder Logic and other Programming Formats	10
7.	Relay Logic, Timers, Counters, Comparator, Math Instructions, Bit Shift Registers in PLC	10
8.		
	Total	**60**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Test 1	Week 6	**15**
2.	Test 2	Week 12	**15**
3.	Assignments/ Quizzes	Every chapter	**10**
4.	Mini Project	Week 13	**10**
5.	Final Exam	At the end of the semester as determined by the academic calendar	**50**
	Sum		**100**

*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.** Mikeel P. Groover, Automation Production Systems and Computer Integrated Manufacturing, 3rd edition, Prentice Hall, 2007.
Supportive References	1. Frank Lamb, Industrial Automation, McGraw Hill, Fifth Edition, 2013. **2.** C. Ray Asfahl, Robots and Manufacturing Automation, 2nd edition, John Wiley & Sons, 1992.
Electronic Materials	Youtube channel for Industrial Automation concepts
Other Learning Materials	Lecture notes

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom
Technology equipment (projector, smart board, software)	White Board, Smart Board
Other equipment (depending on the nature of the specialty)	Students use their own Laptops to complete mini project

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester to identify weaknesses in the course.
Effectiveness of Students assessment	Students	Feedback from Test 1, Test 2, and Final exam records.
Quality of learning resources	Students	A questionnaire is administered at the end of every semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

Course Specification
(Bachelor)

Course Title:	Industrial Automation
Course Code:	443-MRE-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	1
Last Revision Date:	26/1/2026

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A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (3,0,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: 9th /5th					
4. Course General Description:					
Principles of electric drive; Definitions; Electrical considerations: running, starting, braking; Mechanical considerations: type of enclosure, noise, drive transmission, motor selection; Electric traction; DC & AC solid state drives.					
5. Pre-requirements for this course (if any)**:**					
317-MRE-3					
6. Co-requisites for this course (if any)**:**					
N/A					
7. Course Main Objective(s):					
After completing this course, the students should be able to: 1. Recognize the structure and operation of different types of electric drive systems. 2. Study the characteristics and use of electric drives.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	60
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		60

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Define and classify the different electrical machines and drive systems.	1	- Lectures Tutorials	- Homework - Assignment - Quizzes Final exam
1.2				
1.3				
2.0	**Skills**			
2.1	Analyze solid state power electronic circuits for DC and AC drive systems.	6	- Lectures Tutorials	- Homework - Assignment - Quizzes - Test 2 Final exam
2.2	Design models of DC, AC motors and speed controller.	2	- Lectures Tutorials	- Mini project - presentation - Assignment - Quizzes - Test 2 Final exam
2.3	Analyze the AC motor speed controller.	6	- Lectures Tutorials	- Assignment - Quizzes - Test 2 Final exam
2.4	Communicate effectively to perform the presentation.	3	- Lectures Tutorials	- Mini Project Presentation
3.0	**Values, autonomy, and responsibility**			

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
3.1	Recognize ethical and professional responsibilities in engineering situations and make informed judgments	4	- Lectures Tutorials	- Mini project Reports
3.2	Perform as an effective team-player in executing related project with imposed design constraints.	5	- Lectures Tutorials	Mini project
3.3				

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to electrical drives and solid-state power converters.	6
2.	Basic components of electrical drive systems.	4
3.	Analysis of the basic criterion of selecting an electric motor for a given drive system.	6
4.	DC solid state drive systems.	18
5.	AC solid state drive systems.	18
6.	Application of control methods to regulate motor speed, position, and torque.	8
7.		
8.		
Total		60

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Test 1	Week 6	15
2.	Test 2	Week 12	15
3.	Assignments/ Quizzes	Every chapter	10
4.	Mini Project	Week 13	10
5.	Final Exam	At the end of the semester as determined by the academic calendar	50
Sum			100

*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. Krishnan, "Electric Motor Drives", Prentice Hall, 2001. 2. Electrical Machines and Drives, Melkebeek, Jan, Springer, 2018
Supportive References	1. Theodore Wildi, "Electrical Machines, Drives, and Power Systems", 6Th Edition, 2006.
Electronic Materials	http://lib.nu.edu.sa/digitallibbrary.aspx
Other Learning Materials	MATLAB Program.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom
Technology equipment (projector, smart board, software)	- Laptops - Data show - MATLAB
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester to identify weaknesses in the course.
Effectiveness of Students assessment	Students	Feedback from Test 1, Test 2, and Final exam records.
Quality of learning resources	Students	A questionnaire is administered at the end of every semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**

REFERENCE NO.	14470730-1471-00010
DATE	16/1/2026

Course Specification
(Bachelor)

Course Title:	Mobile Robots and Autonomous Systems
Course Code:	444-MRE-3
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	1
Last Revision Date:	26/1/2026

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D. Students Assessment Activities 5
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F. Assessment of Course Quality 6
G. Specification Approval 6

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
3 (3,0,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: 9th /5th					
4. Course General Description:					
A mobile robot is a robot that is capable of moving around in a physical environment. This course will present various aspects of design, fabrication, motion planning, and control of autonomous mobile robotic systems. The course will cover the topics: Introduction to mobile robotics; mobile robot kinematics; perception; mobile robot localization; motion planning, navigation and control.					
5. Pre-requirements for this course (if any)**:**					
322-MRE-3 and 333-MRE-3					
6. Co-requisites for this course (if any)**:**					
N/A					
7. Course Main Objective(s):					
To provide training in rigorously applying mechatronic design principles to the development of a mobile robotic system, incorporating the use of advanced control, signal processing and machine learning algorithms.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	60
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		60

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	An ability to explain the operational principles of mobile robots and distinctions between various types of mobile robot architectures	1	- Class Lectures, Tutorials	Quizzes, Mid Term Exams, Final Exam
1.2	Recognize the perception and localization challenges of mobile robots	7	- Class Lectures, Tutorials	Quizzes, Mid Term Exams, Final Exam
1.3				
2.0	**Skills**			
2.1	Design and deploy an autonomous mobile robot capable of mapping, localization, path planning, and motion planning	2	- Class Lectures, Tutorials	Mini-Project, Mid Term, Exams, Final Exam
2.2	Evaluate the Mobile Robot Kinematics	6	- Class Lectures, Tutorials	Quizzes, Mid Term Exams, Final Exam
2.3				
3.0	**Values, autonomy, and responsibility**			
3.1	Perform as an effective team-player in executing related project with imposed design constraints.	5	Class Lectures	Mini-project
3.2	Communicate effectively to perform the presentation.	3	Class Lectures	Presentation
3.3				

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to mobile robotics and autonomous systems	06
2.	Robot Locomotion	04
3.	Mobile Robot Kinematics	12
4.	Perception in Mobile Robotics	14
5.	Mobile Robot Localization	14
6.	Planning and Navigation	10
7.		
8.		
	Total	**60**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Test 1	Week 6	15
2.	Test 2	Week 12	15
3.	Assignments/ Quizzes	Every chapter	10
4.	Mini Project	Week 13	10
5.	Final Exam	At the end of the semester as determined by the academic calendar	50
	Sum		**100**

*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. R. Siegwart, I. R. Nourbakhsh, "Introduction to Autonomous Mobile Robots", The MIT Press, 2011
Supportive References	1. Peter Corke , Robotics, Vision and Control: Fundamental Algorithms in MATLAB, Springer Tracts in Advanced Robotics, 2011. 2. Thrun, S., Burgard,W., and Fox, D., Probabilistic Robotics. MIT Press, Cambridge, MA, 2005. 3. H. Choset, K. M. Lynch, S. Hutchinson, G. Kantor, W. Burgard, L. E. Kavraki, and S. Thrun, Principles of Robot Motion: Theory, Algorithms and Implementations, PHI Ltd., 2005
Electronic Materials	Youtube channel for Industrial Automation concepts
Other Learning Materials	Lecture notes

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom
Technology equipment (projector, smart board, software)	White Board, Smart Board
Other equipment (depending on the nature of the specialty)	Students use their own Laptops to complete mini project

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester to identify weaknesses in the course.
Effectiveness of Students assessment	Students	Feedback from Test 1, Test 2, and Final exam records.
Quality of learning resources	Students	A questionnaire is administered at the end of every semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

Public - عام

Course Specification
(Bachelor)

Course Title:	Readiness
Course Code:	480-JHZ-0
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	1
Last Revision Date:	26/1/2026

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G. Specification Approval.....6

A. General information about the course:

1. Course Identification

1. Credit hours: (0)					
0(0,0,1)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: xx/xx					
4. Course General Description:					

This course prepares students for national and international engineering licensure examinations, including the Fundamentals of Engineering (FE) Exam and the Saudi National Engineering Examination. The course reviews core electrical engineering knowledge units, problem-solving strategies, exam techniques, and professional practice topics aligned with international standards and national learning outcomes.

The course emphasizes:

- Solving complex engineering problems
- Applying engineering standards and codes
- Time management in exam settings
- Ethical and professional responsibility

5. Pre-requirements for this course (if any)**:**

391-MRE-2

6. Co-requisites for this course (if any)**:**

7. Course Main Objective(s):

- Review and integrate core Electrical Engineering knowledge units.
- Solve FE-style and national exam-style problems efficiently.
- Apply engineering standards and professional codes.
- Demonstrate exam readiness through mock examinations.
- Identify knowledge gaps and develop lifelong learning strategies.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	15	100
2	E-learning	0	0

No	Mode of Instruction	Contact Hours	Percentage
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	15
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		15

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Explain core concepts in circuits, electronics, electromagnetics, power, control, communications, and mathematics.	1	Structured problem-solving sessions Timed mock examinations Group review sessions Practice quizzes Self-assessment diagnostics	Quizzes Midterm Mock Exam Homework & Practice Sets Final Comprehensive Mock Exam
1.2	Recognize engineering standards, safety codes, and professional ethics.	1		
1.3	Identify exam structure, format, and scoring methodology.	1		
2.0	**Skills**			
2.1	Solve complex engineering problems under time constraints.	6	Structured problem-solving sessions	Quizzes Midterm Mock Exam
2.2	Analyze and interpret data using	6		

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	engineering tools.		Timed mock examinations Group review sessions Practice quizzes Self-assessment diagnostics	Homework & Practice Sets Final Comprehensive Mock Exam
2.3	Apply appropriate solution strategies aligned with exam requirements.	6		
2.4	Use approved reference materials efficiently.	6		
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate ethical responsibility in professional practice.	4	Structured problem-solving sessions Timed mock examinations Group review sessions Practice quizzes Self-assessment diagnostics	Quizzes Midterm Mock Exam Homework & Practice Sets Final Comprehensive Mock Exam
3.2	Engage in self-directed learning for exam preparation.	7		
3.3	Manage time effectively during technical examinations.	4		

C. Course Content

No	List of Topics	Contact Hours
1.	Module 1: Mathematics & Basic Engineering Tools • Calculus (single & multivariable) • Differential equations • Linear algebra • Probability & statistics • Engineering economics	**2**
2.	Module 2: Electrical Circuits & Linear Systems • KCL, KVL • Thevenin & Norton • Phasors & impedance • Laplace transforms • Frequency response	**2**
3.	Module 3: Electronics • Diodes, BJT, MOSFET	**2**

	• Amplifiers • Operational amplifiers • Basic power electronics	
4.	Module 4: Signals & Communications • Fourier series & transforms • Sampling & aliasing • Modulation techniques • Digital communication basics	**2**
5.	Module 5: Power & Machines • Power systems basics • Transformers • Three-phase systems • Motors and generators	**2**
6.	Module 6: Control Systems • Block diagrams • Stability • Bode plots • Closed-loop response	**2**
7.	Module 7: Electromagnetics • Electrostatics & magnetostatics • Maxwell equations • Transmission lines	**1**
8.	Module 8: Ethics & Professional Practice • Engineering codes of ethics • Public safety • Professional responsibility • Engineering standards	**1**
9.	Module 9: Exam Strategies & Mock Exams • FE computer-based test format • Time management techniques • Practice exams • Performance analysis	**1**
10.		
11.		
12.		
13.		
14.		

Total	15

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	Every Week	20
2.	Midterm Mock Exam	Week 8	20
3.	Homework & Practice Sets	Every chapter	10
4.	Final Comprehensive Mock Exam	At the end of the semester as determined by the academic calendar	50
5.			
	Sum		100

*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	National Council of Examiners for Engineering and Surveying, *FE Electrical and Computer Exam Specifications*, latest edition.
Supportive References	1. Education and Training Evaluation Commission, Key Learning Outcomes for Electrical Engineering Programs. 2. Saudi Council of Engineers – Professional Licensure Guidelines. 3. FE Review Manuals (Electrical & Computer). 4. Previous national engineering exam practice materials.
Electronic Materials	None
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room for a maximum of 20 students
Technology equipment (projector, smart board, software)	- Laptops - Data show
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester to identify weaknesses in the course.
Effectiveness of Students assessment	Students	Feedback from Test 1, Test 2, and Final exam records.
Quality of learning resources	Students	A questionnaire is administered at the end of every semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

Course Specification
(Bachelor)

Course Title:	Graduation Project II
Course Code:	492-MRE-2
Program:	Mechatronics and Robotics Engineering
Department:	Electrical Engineering
College:	Engineering
Institution:	Najran University
Version:	1
Last Revision Date:	26/1/2026

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G. Specification Approval 6

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
2 (1,2,0) Credit hours (Theory, Lab, Tutorial)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: 9th /5th					
4. Course General Description:					
The graduation project is a culminating handy course work for which the students are expected to integrate and apply what they have learned through previous academic work and field experiences, with faculty supervision. This is the continuation of graduation project-I, and consequently graduation project-II is supposed to be taken in the consecutive semester. Throughout the semester, the students try to implement what they proposed in graduation project-I as a group. Project students meet in class or lab weekly, segregate the work into sub-projects, and integrate the individual works to reach their target and faculty critique and suggestions. At the conclusion of the semester, students present their design projects along with the thesis to the supervising committee.					
5. Pre-requirements for this course (if any)**:**					
391-MRE-2					
6. Co-requisites for this course (if any)**:**					
N/A					
7. Course Main Objective(s):					
After completing this course the students should be able to: 1. Identify and formulate engineering problems in the area of electrical engineering. 2. Work effectively as a member of the team 3. Conduct enough literature review in the project domain. 4. Design a system, component, or process with defined constraints. 5. Solve engineering problems and implement designed solution. 6. Collect and analyze data, and draw conclusions though experiments while testing a project.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	54	90
2	E-learning	06	10
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	15
2.	**Laboratory/Studio**	30
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		45

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Conduct enough literature review in the project domain.	7	- Lectures - Discussion rounds	- Presentation Final Report Draft
1.2	Identify and formulate engineering problems in the area of Mechatronics and Robotics engineering	1	- Lectures - Discussion rounds	- Log book - Presentation Final Report Draft
1.3				
2.0	**Skills**			
2.1	Design a system, component or process with defined constraints.	2	- Lectures - Discussion rounds	- Presentation Final Report Draft
2.2	Collect and analyze data, and draw conclusions though	6	- Lectures - Discussion	- Presentation

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	experiments while testing a project		rounds - Computer programing tools Lab	Final Report Draft
2.3	Solve engineering problems and implement designed solution	2	- Lectures - Discussion rounds	- Log book - Presentation Final Report Draft
2.4	Communicate orally and in writing the project design details in a technical report.	3	Discussion rounds	- Log book Presentation
3.0	**Values, autonomy, and responsibility**			
3.1	Work effectively as a member of the team.	5	- Lectures Discussion rounds	Log book
3.2	Recognize ethical and professional responsibilities in engineering situations and make informed judgments.	4	Discussion rounds	- Log book Presentation
3.3				

C. Course Content

No	List of Topics	Contact Hours
1.	Prepare a road-map, collect the necessary equipment/software for the project that was proposed, planned and studied in graduation project I.	8
2.	Planning and implementation, peer review, critical comments and suggestions from the supervisor.	4
3.	Design and investigation of complex problems using proper techniques, tools and resources	8
4.	Testing, data analysis, validation and critical thinking	8
5.	Results and discussion including societal/health/safety impact	8
6.	Comparison, conclusion, recommendation and assessment on implication to society/environment	5
7.	Submit the report along with the project work to the committee	4
8.		
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Logbook	Every week	15
2.	Presentation and Poster (Assessment Panel)	Week 16	20
3.	Final Report Draft (Supervisor)	Week 16	35
4.	Final Report Draft (Assessment Panel)	Week 16	30
5.			
	Sum		**100**

*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	Any available books in the library related to project work.
Supportive References	The students review the literature of the project from Published research articles.
Electronic Materials	Youtube channel for project concepts
Other Learning Materials	The work is done by the students on the software related to the project (like MATLAB, Pspice, Lab view, ARDUINO)

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	The department provides the classroom and Lab facilities needed by the students (maximum 3 students for each group).
Technology equipment (projector, smart board, software)	MATLAB, Pspice, Lab view, ARDUINO
Other equipment (depending on the nature of the specialty)	NA

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	1. A questionnaire is administered upon completing the course syllabus. 2. Open discussion with students during the semester to identify weaknesses in the course.

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of Students assessment	Students	Feedback from Test 1, Test 2, and Final exam records.
Quality of learning resources	Students	A questionnaire is administered at the end of every semester.
The extent to which CLOs have been achieved	Teaching staff	Analysis of students' results using an Excel sheet to measure CLO achievement.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Electrical Engineering Department Council**
REFERENCE NO.	**14470730-1471-00010**
DATE	**16/1/2026**

2024
TP-155

Field Experience Specification
(Bachelor)

Course Title:	**Cooperative Training**
Course Code:	**490-MRE-3**
Program:	**Mechatronics and Robotics Engineering**
Department:	**Electrical Engineering**
College:	**Engineering**
Institution:	**Najran University**
Field Experience Version Number:	*1*
Last Revision Date:	**26/1/2026**

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A. Field Experience Details:

1. Credit hours: 3

2. Level/year at which Field Experience is offered: 10th/5th

3. Time allocated for Field Experience activities

(15) Weeks	(75) Days	(600)Hours

4. Corequisite (or prerequisites, if any) to join Field Experience

At least complete 162 Credit hours

5. Mode of delivery

☒ In-person/onsite	☐ hybrid (onsite/online)	☐ Online

B. Field Experience Course Learning Outcomes (CLOs), Training Activities and Assessment Methods

Code	Learning Outcomes	Aligned PLO Code	Training Activities	Assessment Methods	Assessment Responsibility
1.0	Knowledge and understanding				
1.1	Apply design concepts and skills learned from previous courses in the fieldwork to solve problems related to Mechatronics and Robotics Engineering.	2	• Independent learning • Cooperative learning	Practical test Field report Oral test Presentation	Teaching Staff Field Supervisor
1.2	Analyze and interpret the machine drawings and its operations.	6	• Independent learning • Cooperative learning	Field report	Teaching Staff Field Supervisor
2.0	Skills				
2.1	Deliver and present the work field reports effectively through written and oral communication.	3	• Independent learning • Cooperative learning	Oral test Presentation	Teaching Staff Field Supervisor
2.2	Communicate effectively within the working environment in a teamwork.	5	• Independent learning • Cooperative learning	Oral test Presentation	Teaching Staff Field Supervisor
2.3	Follow safety regulations and professional	4	• Independent learning	Practical test	Teaching Staff Field Supervisor

Code	Learning Outcomes	Aligned PLO Code	Training Activities	Assessment Methods	Assessment Responsibility
	responsibility in the fieldwork and office work to make proper judgements.		Cooperative learning	Oral test Presentation	
3.0	**Values, autonomy, and responsibility**				
3.1					
3.2					
...					

*Assessment methods (i.e., practical test, field report, oral test, presentation, group project, essay, etc.).

Assessment Responsibilities

#	Category	Assessment Responsibility
1	Teaching Staff	• Evaluate the student's performance based on weekly reports and direct feedback from the field supervisor. • Visit the trainee students in the field training at least once per period of training. • Prepare the field experience report after completing the requirements of the field training. • List recommendations for continuous improvement.
2	Field Supervisor	• Supervising the students during the field work. • Follow and monitor the student's performance and progress. • Evaluate the students and report to the teaching staff after completing the requirements of the field training.
3	Others (specify)	None.

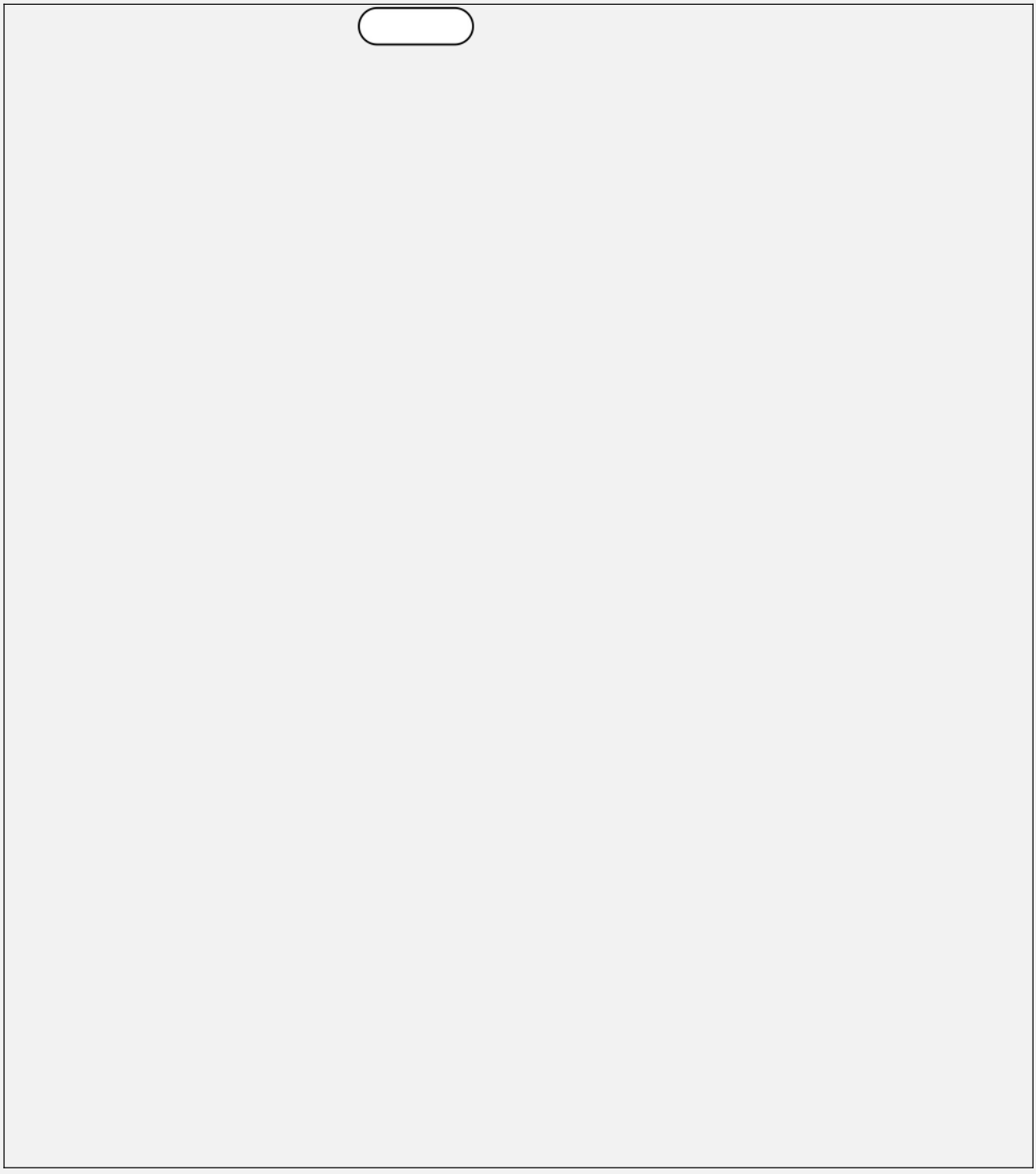
Students Assessment Timetable

#	Assessment task*	Assessment timing (Week)	Percentage of Total Assessment Score
1	Final training report	8th week	20%
2	Defense of training	8th week	20%
3	Supervisor of training	Weekly	20%
4	Training Evolution (Form No. 4)	8th week	20%
5	Logbook	Weekly	20%
Total			**100%**

C. Field Experience Administration

1. Field Experience Flowchart for Responsibility

Including units, departments, and committees responsible for field experience identifying by the interrelations.



2. Distribution of Responsibilities for Field Experience Activities

Activities	Department or College	Teaching Staff	Student	Training Organization	Field Supervisor
Selection of a field experience site	√	√	√		
Selection of supervisory staff	√	√			
Provision of the required equipment				√	√
Provision of learning resources	√	√		√	√
Ensuring the safety of the site				√	√
Commuting to and from the field experience site	√	√	√	√	√
Provision of support and guidance		√		√	√
Implementation of training activities (duties, reports, projects ...)		√		√	√
Follow up on student training activities		√		√	√
Monitoring attendance and leave				√	√
Assessment of learning outcomes	√	√		√	√
Evaluating the quality of field experience		√	√		√
Others (specify)					

3. Field Experience Location Requirements

Suggested Field Experience Locations	General Requirements*	Special Requirements**
Saudi Electricity Company	• Availability of resources. • Availability of equipment. Availability of laboratories (if any).	Must follow safety standards, regulations, and instructions of every field experience location.
Saudi Telecom Company (STC)		
Najran Municipality		
Projects Management Companies at Najran University		
Any other private company in the field of Mechatronics and Robotics engineering		

* E.g., Provides information technology, equipment, laboratories, halls, housing, learning sources, clinics ... etc.
** E.g., Criteria of the institution offering the training or those related to the specialization, such as safety standards, dealing with patients in medical specialties ... etc.

4. Decision-Making Procedures for Identifying Appropriate Locations for Field Experience

The training field committee in the program will identify the appropriate locations for field experience based on the following points:

1. Feedback from the trainee students: The field trainee students can meet their academic supervisor during the official working hours or by email to submit the weekly report and to explain the work carried out in the company and difficulties if any.
2. Feedback from the teaching staff (academic supervisor): The academic supervisor should visit the trainee students in the field training at least one time per period of training to see its appropriateness for students' training.
3. Direct feedback from the field supervisor.
4. Questionnaires (trainee students, field supervisor).
5. Field experience report after completing the requirements of the field training.
6. The listed recommendations by trainee students, field supervisor, and academic supervisor.

5. Safety and Risk Management

Potential Risks	Safety Actions	Risk Management Procedures
The expulsion of training without compelling reasons.	Official agreement should be formalized between the college and the field training location.	Work in accordance with the conditions as given in the agreement.
Possibility of injury the trainee during the field training.	Official agreement should be formalized between the college and the field training location.	Work in accordance with the conditions as given in the agreement.

D. Training Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of training and assessment	- Students - Company's supervisors	- A questionnaire is administered upon completing the course. - Open discussion for the students during the semester to recognize their weak points in the course
Extent of students' achievement of course learning outcomes	Academic supervisor	Excel sheet
Improvement of field training	- Students Company's supervisors	- Learning from students' feedback - Learning from company's supervisors' feedback
Quality of learning resources	Students	Questionnaire is administered by the end of every semester
Verifying standards of student achievement	- Program leader Academic supervisor	Check student's marks by the program leader of a sample of student work.

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

Evaluators (Students, Supervisory Staff, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

E. Specification Approval Data

Council /Committee	**Electrical Engineering Department Council**
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