هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification

(Bachelor)

Course Title: Electrical Circuits (1)	
Course Code: ELEN1201	
Program: Bachelor of Science in Electrical Engineering	
Department: Department of Electrical Engineering	
College: Faculty of Engineering	
Institution: University of Tabuk	
Version: 4	
Last Revision Date: 10 October 2023	

Table of Contents

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: (4th Level/ 2nd Year)					
4. Course general Description:					

Basic Concepts: Systems of Units, Charge and Current, Voltage, Power and Energy, Circuit Elements; Basic Laws: Ohm's Law, Nodes, Branches, and Loops, Kirchhoff's Laws, Series Resistors and Voltage and Current Division, Wye-Delta Transformations; Methods of Analysis: Mesh and Nodal Analysis; Circuit Theorems: Linearity Property, Superposition, Source Transformation, Thevenin's Theorem, Norton's Theorem, Maximum Power Transfer; Capacitors and Inductors: Capacitors, Series and Parallel Capacitors, Inductors, Series and Parallel Inductors, Current-voltage Relationships, DC steady-state analysis; First-Order Circuits: Source-Free RC and RC Circuits, Step Response of an RC and RC Circuits; Operational Amplifiers: Ideal Op Amp, Feedback, Inverting Amplifier, Noninverting Amplifier, Summing Amplifier; differentiator, Integrator, Comparator.

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

MATH1205: Linear Algebra& PHYS1271: General Physics

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

None

7. Course Main Objective(s):

- Learn basic electrical laws, units, and dimensional analysis.
- Apply different techniques to analyze dc electric 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	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**	39
.2	**Laboratory/Studio**	0
.3	**Field**	0
.4	**Tutorial**	0
.5	**Problem solving sessions**	6
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	Demonstrate a comprehensive Knowledge and understanding of electric circuits concepts.	**K1**	Lectures	Exams
2.0	**Skills**			
2.1	Apply fundamental circuit laws and techniques to calculate voltage, current, power, and equivalent resistance in resistive networks	**S1**	Lectures and Problem-based learning	Quizzes/ Assignments/ Exams
2.2	Analyze complex resistive electric circuits using mesh and nodal analysis methods.	**S1**	Lectures and Problem-based learning	Quizzes/ Assignments/ Exams
2.3	Apply circuit theorems for the simplification and analysis of resistive electrical circuits	**S1**	Lectures and Problem-based learning.	Quizzes/ Assignments/ Exams

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.4	Use the current-voltage relationships of capacitors and inductors to calculate equivalent capacitance and inductance values and analyze their circuits under DC steady-state conditions.	**S1**	Lectures and Problem-based learning.	Quizzes/ Assignments/ Exams
2.5	Analyze transient responses in first order RL and RC circuits.	**S1**	Lectures and Problem-based learning.	Quizzes/ Assignments/ Final Exam
2.6	Analyze different types of basic Operational Amplifier (Op-Amp) circuits.	**S1**	Lectures and Problem-based learning	Quizzes/ Assignments/ Final Exam
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate a commitment to academic integrity and values by consistently engaging in ethical conduct throughout assessments.	**V1**	Lectures	Calculate the percentage of instances reflecting exemplary ethical behavior during assessments.

C. Course Content

No	List of Topics	Contact Hours
1.	Basic Concepts: Systems of Units, Charge and Current, Voltage, Power and Energy, Circuit Elements.	3
2.	Basic Laws: Ohm's Law, Nodes, Branches, and Loops.	3
3.	Basic Laws: Kirchhoff's Laws, Series Resistors and Voltage and Current Division.	3
4.	Wye-Delta Transformations.	3
5.	Methods of Analysis: Mesh Analysis.	3
6.	Methods of Analysis: Nodal Analysis.	3
7.	Methods of Analysis Review and Exercises	3

8.	Circuit Theorems: Linearity Property, Superposition, Source Transformation.	3
9.	Circuit Theorems: Thevenin's Theorem, Norton's Theorem, Maximum Power Transfer	3
10.	Operational Amplifiers: Ideal Op Amp, Feedback, Inverting Amplifier, Noninverting Amplifier,	3
11.	Operational Amplifiers: Summing Amplifier; differentiator, Integrator, Comparator.	3
12.	Capacitors: Capacitors, Series and Parallel Capacitors, Current-voltage Relationships, DC steady-state analysis.	3
13.	Inductors: Series and Parallel Inductors, Current-voltage Relationships, DC steady-state analysis.	3
14.	First-Order Circuits: Source-Free RC and RL Circuits.	3
15.	First-Order Circuits: Step Response of an RL and RC Circuits	3
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	3,5,9,13,14	10%
2.	Assignments and Attendance	Every week	10%
3.	Midterm Exam 1	5-7	20%
.4	Midterm Exam 2	10-12	20%
.5	Final Exam	17	40%

*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	Charles K. Alexander, Matthew N. O. Sadiku, Fundamentals of Electric Circuits, 7th Edition, McGraw-Hill, 2021.
Supportive References	• Lecture Handouts
Electronic Materials	Course Page on Blackboard
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Classroom with 25 seats**
Technology equipment (projector, smart board, software)	**Data show, Blackboard Teaching-Learning Interface**
Other equipment (depending on the nature of the specialty)	**Reprographic facilities**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect through survey
Effectiveness of Students assessment	• Students • Head of the department • Vice dean	Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary
Quality of learning resources	Students	Indirect through survey
The extent to which CLOs have been achieved	Course Instructor	Direct through tests
Other	None	None

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

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1201/Semester-1/1445 H
DATE	30/10/2023

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification

(Bachelor)

Course Title: Engineering Analysis	
Course Code: ELEN1202	
Program: Bachelor of Science in Electrical Engineering	
Department: Department of Electrical Engineering	
College: Faculty of Engineering	
Institution: University of Tabuk	
Version: 4	
Last Revision Date: 30 October 2023	

Table of Contents

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: (6th Level/ 3rd Year)					
4. Course general Description:					
Imaginary numbers, complex numbers, operations on complex numbers, Euler's formula, De Moivre's theorem, functions of complex numbers, limits, Cauchy-Riemann conditions, differentiation of complex functions, partial fractions, integration of complex functions, contour integration, sets and set theory, propositional logic and proof, graphs, Introduction to MATLAB®. MATLAB® Environment. Built-in MATLAB® Functions and complex numbers. Matrices and vectors.					
5. Pre-requirements for this course (if any)**:**					
MATH1271, MATH 1205					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
• To introduce students to complex functions and set theory concepts arising in Electrical Engineering. • To analyze complex functions and set theory.					

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**	39
.2	**Laboratory/Studio**	0
.3	**Field**	0
.4	**Tutorial**	0
.5	**Problem Solving Sessions**	6
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	Demonstrate a comprehensive Knowledge and understanding of engineering analysis concepts.	**K1**	Lectures	Exams
2.0	**Skills**			
2.1	Apply basic operations of complex variables.	**S1**	Lectures and Problem-based learning	Assignments / Quizzes / Exams
2.2	Apply Cauchy-Riemann conditions and differentiate functions of complex variables.	**S1**	Lectures and Problem-based learning	Assignments / Quizzes / Exams
2.3	Apply partial fraction expansion to complex functions.	**S1**	Lectures and Problem-based learning	Assignments / Quizzes / Exams
2.4	Integrate complex functions.	**S1**	Lectures and Problem-based learning	Assignments / Quizzes / Exams

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.5	Perform basic operations on sets.	**S1**	Lectures and Problem-based learning	Assignments / Quizzes / Exams
2.6	Derive and analyze logical statements.	**S1**	Lectures and Problem-based learning	Assignments / Quizzes / Exams
2.7	Perform scientific calculations using computer software (MATLAB®)	**S5**	Lectures and Experimental-based learning	Assignments / Quizzes / Exams
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate a commitment to academic integrity and values by consistently engaging in ethical conduct throughout assessments.	**V1**	Lectures	Calculate the percentage of instances reflecting exemplary ethical behavior during assessments.

C. Course Content

No	List of Topics	Contact Hours
1.	Complex numbers and their operations	3
2.	Functions of complex and De Moivre's Theory	3
3.	Differentiation of complex functions	3
4.	Analytic complex functions and Cauchy-Riemann equations	3
5.	Partial fraction expansion of complex functions	3
6.	Integration of complex functions	3
7.	Cauchy's integral formulas	3
8.	Sets and relations theory	3
9.	Logical statements	3
10.	Directed Graphs, or digraphs, of relation	3
11.	Finite State Machines	3
12.	Introduction and overview of MATLAB	3
13.	Practice examples on the built in functions in MATLAB	3
14.	Apply complex number calculation in MATLAB	3
15.	Using MATLAB to deal with matrices and vectors	3

Total	45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignments / Quizzes	3, 9, 14	20%
2.	Midterm Exam 1	5-7	20%
.3	Midterm Exam 2	10-12	20%
.4	Final Exam	16-17	40%

*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	James W. Brown, Ruel V. Churchill, "Complex Variables and Applications", McGraw-Hill Education, 9th Edition, 2014.
Supportive References	• Lecture Handouts
Electronic Materials	Course Page on Blackboard
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Classroom with 25 seats**
Technology equipment (projector, smart board, software)	**Data show, Blackboard Teaching-Learning Interface**
Other equipment (depending on the nature of the specialty)	**Reprographic facilities**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect through survey
Effectiveness of Students assessment	• Students • Head of the department • Vice dean	Indirect, where students use survey and head of the department and vice dean review the grades

Assessment Areas/Issues	Assessor	Assessment Methods
		excel sheets and meet with instructors and provide feedback when necessary
Quality of learning resources	Students	Indirect through survey
The extent to which CLOs have been achieved	Course Instructor	Direct through tests
Other	None	None

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1202/Semester-1/1445 H
DATE	30/10/2023

Course Specification

(Bachelor)

Course Title: Fundamentals of Electrical Engineering	
Course Code: ELEN1215	
Program: Bachelor of Science in Electrical Engineering	
Department: Department of Electrical Engineering	
College: Faculty of Engineering	
Institution: University of Tabuk	
Version: 4	
Last Revision Date: 10 November 2023	

Table of Contents

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: (6th Level/3rd Year)					
4. Course general Description:					
Basic concepts: systems of units, charge and current, voltage, power, and energy; circuit elements; basic circuit laws; circuit theorems; inductance and capacitance; introduction to ideal operational amplifiers and its applications; AC circuits; three-phase circuits; transformers; concepts of electrical machines; semiconductor materials; diodes and transistors.					
5. Pre-requirements for this course (if any):					
MATH1205: Linear Algebra; PHYS1271: General Physics					
6. Co-requisites for this course (if any):					
None					
7. Course Main Objective(s):					
• Provide the student with the fundamental knowledge of basic electrical concepts that will form a major part of the foundation required to analyze electrical and electronic systems. • Develop an overall understanding of electrical laws and rules and methods of analysis.					

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 CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Understand basic principles of electrical charges, current, voltage, power, energy, resistance, capacitance, inductance, impedance, and three-phase circuits.	K1	Lecture-Based Learning	Quizzes, Exams
1.2	Demonstrate the knowledge of ideal operational amplifiers and its applications, concepts of transformers and electrical machines, and the operation and applications of diodes and transistors.	K1	Lecture-Based Learning	Quizzes, Exams
2.0	**Skills**			
2.1	Apply basic circuit laws.	S1	Lectures and Problem-based learning	Quizzes, Exams
2.2	Analyze simple DC and AC circuits.	S1	Lectures and Problem-based learning	Quizzes, Exams

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.3	Solve problems of ideal operational amplifiers and its applications	S1	Lectures and Problem-based learning	Quizzes, Exams
2.4	Conduct experimentation for electric circuits.	S3	Experiment-Based Learning	Assignments
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate a commitment to academic integrity and values by consistently engaging in ethical conduct throughout assessments.	V1	Lectures and Problem-based learning	Assignment s/Exams

C. Course Content

No	List of Topics	Contact Hours
1.	Electric circuit variables.	4
2.	Circuit elements.	4
3.	Basic circuit laws: Ohm’s law, Nodes, Branches and Loops	4
4.	Basic circuit laws: Kirchhoff’s Laws, and Series Resistors	4
5.	Basic circuit laws: voltage and current division	4
6.	Circuit analysis: Mesh Analysis	4
7.	Circuit analysis: Nodal Analysis	4
8.	Inductance: Series and Parallel Inductors, Current-voltage Relationships	4
9.	Capacitance: Series and Parallel Capacitors, Current-voltage Relationships	4
10.	Operational amplifiers.	4
11.	AC circuits.	4
12.	Transformers.	4
13.	Electrical machines.	4
14.	Diodes	4
15.	Transistors.	4
Total		**60**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	6, 10, 14	20%
2.	Midterm Exam 1	8	15%
.3	Midterm Exam 2	12	15%
.4	Lab Reports	Every week	20%
.5	Final Exam	18	30%

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

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Robert L. Boylestad, "Introductory Circuit Analysis", Pearson Education Limited, 13th Edition, 2016.
Supportive References	• Lecture slides • Stephen J. Chapman, "Electric Machinery Fundamentals", McGraw-Hill, 5th Edition, 2012.
Electronic Materials	Course Page on Blackboard
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom, Electrical Circuits Laboratory
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	Students	Indirect through survey
Effectiveness of Students’ assessment	• Students • Head of the department • Vice dean	Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary.
Quality of learning resources	Students	Indirect through survey
The extent to which CLOs have been achieved	Course Instructor	Direct from exam results
Other	None	None

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1215/Semester-1/1445 H
DATE	10/11/2023

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
(Bachelor)

Course Title: Electrical Circuits (2)	
Course Code: ELEN1301	
Program: Bachelor of Science in Electrical Engineering	
Department: Department of Electrical Engineering	
College: Faculty of Engineering	
Institution: University of Tabuk	
Version: 4	
Last Revision Date: 10 October 2023	

Table of Contents

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 Level/ 3rd Year)					
4. Course general Description:					
Transient analysis of RLC circuits, Sinusoids and Phasors, Sinusoidal Steady-State Analysis, AC Power Analysis, Introduction to Three-Phase Circuits, Frequency Response of Circuits, Two-port Networks, magnetically coupled circuits.					
5. Pre-requirements for this course (if any)**:**					
ELEN1201: Electrical Circuits (1), MATH1215:Differnatial Equations					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
The course aims to equip students with skills required in analyzing complex AC electrical 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**	39
.2	**Laboratory/Studio**	0
.3	**Field**	0
.4	**Tutorial**	0
.5	**Problem solving sessions**	6
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	Demonstrate a comprehensive Knowledge and understanding of AC electric circuits concepts.	**K1**	Lectures	Exams
2.0	**Skills**			
2.1	Analyze transient responses in second order RLC circuits.	**S1**	Lectures and Problem-based learning	Quiz / Assignment/ Exams
2.2	Analyze AC circuits under sinusoidal steady-state conditions.	**S1**	Lectures and Problem-based learning	Quiz / Assignment/ Exams
2.3	Apply circuit theorems for the simplification and analysis of AC circuits	**S1**	Lectures and Problem-based learning	Quiz / Assignment/ Exams
2.4	Calculate and analyze power in AC circuits, including real, reactive, and apparent power, as well as power factor.	**S1**	Lectures and Problem-based learning	Quiz / Assignment/ Exams
2.5	Analyze simple three phase circuits.	**S1**	Lectures and Problem-based learning	Quiz / Assignment/ Final Exam
2.6	Analyze frequency response of circuits.	**S1**	Lectures and Problem-based learning	Quiz/Final Exam

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.7	Analyze magnetically coupled circuits.	**S1**	Lectures and Problem-based learning	Quiz/ Assignment/ Final Exam
2.8	Analyze two-port networks.	**S1**	Lectures and Problem-based learning	Final Exam
2.9	Engage in a collaborative mini project to develop a practical electrical system that fosters hands-on application of learned concepts.	**S2**	Project-based learning	Deliverables/ outcomes of the project
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate effective teamwork skills by collaborating with peers in the successful completion of projects.	**V2**	Project-based learning	Rubrics

C. Course Content

No	List of Topics	Contact Hours
1.	Transient responses in second order RLC circuits: Source-free series and parallel RLC circuit and Step response of a series and a parallel RLC circuit.	3
2.	Sinusoids and Phasors: Motivation, Sinusoids' features, and Phasors.	3
3.	Sinusoids and Phasors: Phasor relationships for circuit elements, Impedance and admittance, Kirchhoff's laws in the frequency domain, and Impedance combinations.	3
4.	Sinusoidal Steady-State Analysis: Basic Approach, Nodal Analysis, and Mesh Analysis.	3
5.	Sinusoidal Steady-State Analysis: Superposition Theorem, Source Transformation, Thevenin and Norton Equivalent Circuits	3
6.	AC Power Analysis: Instantaneous and Average Power, Maximum Average Power Transfer, Effective or RMS Value, Apparent Power, and Power Factor.	3
7.	AC Power Analysis: Complex Power, Conservation of AC Power, and Power Factor Correction.	3
8.	Three-Phase Circuits: What is a Three-Phase Circuit?, Balanced Three-Phase Voltages and Balanced Three-Phase Connections (Y-Y, Y-Δ, Δ-Δ, and Δ-Y).	3
9.	Three-Phase Circuits: Power in a Balanced System and Unbalanced Three-Phase Systems.	3

10.	Magnetically Coupled Circuits: What is a transformer? Mutual Inductance, and Energy in a Coupled Circuit.	3
11.	Magnetically Coupled Circuits: Linear Transformers, Ideal Transformers, and Applications.	3
12.	Frequency Response: Transfer Function and Series Resonance.	3
13.	Frequency Response: Parallel Resonance and Passive Filters.	3
14.	Two-port Networks: Impedance parameters (z) & Admittance parameters (y)	3
15.	Two-port Networks: Hybrid parameters (h) & Transmission parameters (T)	3
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	3,5,9,13,14	10%
2.	Assignments	Every week	10%
3.	Midterm Exam 1	8-9	25%
.4	Mini-Project	10-17	15%
.5	Final Exam	17	40%

*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	Charles K. Alexander, Matthew N. O. Sadiku, Fundamentals of Electric Circuits, 7th Edition, McGraw-Hill, 2021.
Supportive References	• Lecture Handouts
Electronic Materials	Course Page on Blackboard
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Classroom with 25 seats**
Technology equipment (projector, smart board, software)	**Data show, Blackboard Teaching-Learning Interface**

Items	Resources
Other equipment (depending on the nature of the specialty)	**Reprographic facilities**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect through survey
Effectiveness of Students assessment	• Students • Head of the department • Vice dean	Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary
Quality of learning resources	Students	Indirect through survey
The extent to which CLOs have been achieved	Course Instructor	Direct through tests
Other	None	None

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1301/Semester-1/1445 H
DATE	10/10/2023

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023

TP-153

Course Specification

(Bachelor)

Course Title: Electronics (1)	
Course Code: ELEN1302	
Program: Bachelor of Science in Electrical Engineering	
Department: Department of Electrical Engineering	
College: Faculty of Engineering	
Institution: University of Tabuk	
Version: 4	
Last Revision Date: 12.October.2023	

Table of Contents

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: (5^{th} Level/ 3^{rd} Year)					
4. Course general Description:					
Semiconductors: Intrinsic semiconductor, doped semiconductor, current flow in semiconductor, PN junction. Diodes: Ideal Diode, Terminal Characteristics of Junction Diodes, Modeling the Diode Forward Characteristic, Operation in the Reverse Breakdown Region-Zener Diodes, Rectifier Circuits, Limiting and Clamping Circuits, and Special diodes (Varactor, Photodiode, Zener, LED, Schottky, solar cell). Bipolar Junction Transistor (BJT): Device Structure and Physical Operation, Regions of Operation, Current–Voltage Characteristics, DC (large signal) analysis and AC (small signal) analysis of BJT circuits including input/output resistance, and current and voltage gain.					
5. Pre-requirements for this course (if any)**:**					
ELEN1201: Electrical Circuits (1)					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
Upon completion of this course the students will be able to demonstrate the basics of semiconductor physics and the pn junction and shall be able to analyze the operation of diodes, large signal (DC) and small signal (AC) analysis of bipolar junction transistors along with design electronic circuits with diodes and transistors.					

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	39
2.	Laboratory/Studio	0
3.	Field	0
4.	Tutorial	0
5.	Problem Solving Sessions	6
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	Demonstrate knowledge of intrinsic and extrinsic semiconductor, current flow, and pn junction in semiconductor	K2	Lectures and Problem-based Learning	Quizzes/ Assignments/ Exams
1.2	Demonstrate knowledge of Special diodes	K2	Lectures	Quizzes/ Assignments/ Exams
2.0	Skills			
2.1	Solving problems related to semiconductor physics for doping, current flow, and PN junction	S1	Lectures and Problem-based Learning	Quizzes/ Assignments/ Exams
2.2	Analyze Basic diodes and Zener diodes circuits	S1	Lectures and Problem-based Learning	Quizzes/ Assignments/ Exams
2.3	Design diodes circuits	S2	Lectures	Quizzes/ Exams
2.4	Perform large signal analysis (DC Analysis) for BJT	S1	Lectures and Problem-based Learning	Quizzes/ Assignments/ Exams

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.5	Perform small signal analysis (AC Analysis) for BJT	S1	Lectures and Problem-based Learning	Quizzes/ Assignments/ Exams
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate a commitment to academic integrity and values by consistently engaging in ethical conduct throughout assessments.	V1	Lectures	Calculate the percentage of instances reflecting exemplary ethical behavior during assessments.

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Semiconductor material, Atomic Structure, analysis of Bohr's model, direct bandgap, and indirect bandgap materials.	3
2.	Semiconductor material: Introduction of electrons and holes, current flow in semiconductors, comparison of energy band diagram of insulator, semiconductor, and metal.	3
3.	Introduction to doping process, extrinsic semiconductor.	3
4.	Introduction to pn junction.	3
5.	Diodes: Ideal Diode, Terminal Characteristics of Junction Diodes, Modeling the Diode Forward Characteristic.	3
6.	Diodes: Operation in the Reverse Breakdown Region-Zener and Avalanche, junction capacitance – varactor diodes.	3
7.	Special diodes: LEDs, Photodiodes, Solar cells, Schottky Diode, Zener diodes and circuits.	3
8.	Diode circuits: Designing a dc power supply, including rectifiers, filters, voltage regulators	3
9.	Diode circuits: Designing voltage limiter circuits – Clippers and clampers	3
10.	Introduction to Bipolar Junction Transistors (BJT), types of BJT, terminals of BJT and their structures, Forward Active mode of operation (FA)	3
11.	Bipolar Junction Transistor (BJT): Regions of Operation, Current–Voltage Characteristics	3
12.	BJT - Large signal (DC) analysis, dc load line, forward active and saturation mode of operation.	3
13	BJT - DC Biasing including Positive-Negative biasing	3
14	BJT - Small signal (AC) analysis of BJT circuits: input/output resistance.	3
15.	BJT - Small signal (AC) analysis of BJT circuits: current and voltage gain.	3
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	2,4,6,9,13,14	20%
2.	Midterm Exam 1	5-7	20%
3.	Midterm Exam 2	10-12	20%
4.	Final Exam	16	40%

*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	Microelectronics Circuit Analysis and Design, Donald A Neaman, 4th ed.
Supportive References	• Lecture Notes, Handouts on PowerPoint Slides. • Principles of Electronic Materials and Devices, Safa O Kasap, 3rd ed.
Electronic Materials	Course Page on Blackboard
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom with 25 seats
Technology equipment (projector, smart board, software)	Data show, Blackboard Teaching-Learning Interface
Other equipment (depending on the nature of the specialty)	Reprographic facilities

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect through survey
Effectiveness of Students' assessment	• Students • Head of the department • Vice dean	Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and

Assessment Areas/Issues	Assessor	Assessment Methods
		provide feedback when necessary
Quality of learning resources	Students	Indirect through survey
The extent to which CLOs have been achieved	Course Instructor	Direct through tests
Other	None	None

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1302/Semester-1/1445 H
DATE	12/October/2023

2023
TP-153

Course Specification

(Bachelor)

Course Title:	Engineering Computation
Course Code:	ELEN1303
Program:	Bachelor of Science in Electrical Engineering
Department:	Department of Electrical Engineering
College:	Faculty of Engineering
Institution:	University of Tabuk
Version:	4
Last Revision Date:	30 October 2023

Table of Contents

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 Level/ 3rd Year)					
4. Course general Description:					
Fundamentals of numerical methods; numerical errors and error propagation; numerical solution for linear and nonlinear algebraic equations; interpolation and curve fitting; numerical differentiation and integration; numerical solution of differential equations. Write Built-in MATLAB® Functions and user defined functions. Plotting in 2D and 3D. Numerical techniques: solving equations.					
5. Pre-requirements for this course (if any)**:**					
MATH1216, CSC1103					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
• To obtain an understanding of numerical methods and how they can be used to solve electrical engineering problems. • To apply this knowledge by solving practical engineering problems using MATLAB.					

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**	39
.2	**Laboratory/Studio**	0
.3	**Field**	0
.4	**Tutorial**	0
.5	**Problem solving Sessions**	6
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	Demonstrate a comprehensive Knowledge and understanding of engineering computations concepts.	**K1**	Lectures	Exams
2.0	**Skills**			
2.1	Calculate different types of errors.	**S1**	Lectures/Problem-based learning	Assignments / Quizzes / Exams
2.2	Solve linear and nonlinear algebraic equations numerically.	**S1**	Lectures/Problem-based learning	Assignments / Quizzes / Exams
2.3	Apply numerical methods for solving differentiation and integration problems.	**S1**	Lectures/Problem-based learning	Assignments / Quizzes / Exams
2.4	Solve differential equations using numerical methods.	**S1**	Lectures/Problem-based learning	Assignments / Quizzes / Exams
2.5	Apply interpolation and curve fitting.	**S1**	Lectures/Problem-based learning	Assignments / Quizzes / Exams
2.6	Write script and function files to solve engineering problems	**S5**	Lectures Experimental-based learning	Assignments / Quizzes / Exams

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	using computer software (MATLAB®).			
2.7	Plot various 2D and 3D data using computer software (MATLAB®).	**S5**	Lectures Experimental-based learning	Assignments / Quizzes / Exams
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate a commitment to academic integrity and values by consistently engaging in ethical conduct throughout assessments.	V1	Lectures	Calculate the percentage of instances reflecting exemplary ethical behavior during assessments.

C. Course Content

No	List of Topics	Contact Hours
1.	Approximations and errors.	3
2.	Numerical solution of a system of linear equations by Jacobi iterative methods.	3
3.	Numerical solution of a system of linear equations by Gauss-Seidel iterative methods.	3
4.	Numerical solution of a system of nonlinear equations by Newton's method.	3
5.	Numerical differentiation.	3
6.	Numerical integration by trapezoid Rule.	3
7.	Numerical integration by Simpson’s Rule.	3
8.	Numerical solution of differential equations by Euler’s method.	3
9.	Numerical solution of differential equations by fourth-order Runge-Kutta method.	3
10.	Interpolation using a single polynomial.	3
11.	Curve fitting with a linear equation.	3
12.	Introduction and overview of MATLAB	3
13.	Writing MATLAB scripts and user defined functions	3
14.	Solving series and sequence problems in MATLAB	3
15.	Advanced Plotting in MATLAB including 2D, 3D, curve fitting, and polar plot	3

Total	45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignments and Quizzes	3, 9,14	20%
2.	Midterm Exam 1	5-7	20%
.3	Midterm Exam 2	10-12	20%
.4	Final Exam	16-17	40%

*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	Richard L. Burden and J. Douglas Faires, "Numerical Analysis", Richard Stratton, Ninth Edition, 2011.
Supportive References	• Lecture Handouts • Reference: John. H. Mathews and Kurtis D. Fink, "Numerical Methods Using MATLAB", Pearson Prentice Hall, Fourth Edition, 2004.
Electronic Materials	Course Page on Blackboard
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Classroom with 25 seats**
Technology equipment (projector, smart board, software)	**Data show, Blackboard Teaching-Learning Interface**
Other equipment (depending on the nature of the specialty)	**Reprographic facilities**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect through survey
Effectiveness of Students assessment	• Students • Head of the department • Vice dean	Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary
Quality of learning resources	Students	Indirect through survey
The extent to which CLOs have been achieved	Course Instructor	Direct through tests
Other	None	None

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1303/Semester-1/1445 H
DATE	30/10/2023

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
(Bachelor)

Course Title: Electromagnetics (1)	
Course Code: ELEN1304	
Program: Bachelor of Science in Electrical Engineering	
Department: Department of Electrical Engineering	
College: Faculty of Engineering	
Institution: University of Tabuk	
Version: 4	
Last Revision Date: 10 October 2023	

Table of Contents

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 Level/ 3th Year)					
4. Course general Description:					
Review to vector calculus; Electrostatic fields; Gauss's law and divergence; Electric potential; Dielectrics and capacitance; Poisson's and Laplace’s equations; Charge images; Current density and conductors; Magnetostatic fields; Biot–Savart and Ampere's laws; Curl and Stoke's theorem; Magnetic materials and circuits; Self and mutual inductances; Energy in static Fields.					
5. Pre-requirements for this course (if any):					
MATH1216: Multivariate Calculus, PHYS1271: General Physics					
6. Co-requisites for this course (if any):					
None					
7. Course Main Objective(s):					
The main goal of this course is to provide a comprehensive understanding of electromagnetic principles, encompassing topics such as electrostatic and magnetostatic fields, Maxwell's equations, and their applications.					

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**	39
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	0
5.	**Problem solving sessions**	6
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	Demonstrate a comprehensive Knowledge and understanding of electromagnetics concepts.	K1	Lectures	Exams
2.0	**Skills**			
2.1	Apply coordinate systems and vector analysis techniques.	S1	Lectures and Problem-based learning	Quizzes/ Assignments/ Midterm Exam
2.2	Calculate the electric field and electric force using Coulomb's law.	S1	Lectures and Problem-based learning	Quizzes/ Assignments/ Midterm and Final Exams
2.3	Apply Gauss's law to determine the electric field.	S1	Lectures and Problem-based learning	Quizzes/ Assignments / Midterm and Final Exams
2.4	Derive the electric potential and energy from the electric field, and vice versa,	S1	Lectures and Problem-based learning	Quizzes/ Assignments/ Final Exams

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	employing Poisson's Equation.			
2.5	Apply Poisson and Laplace equations in relevant electromagnetic scenarios.	S1	Lectures	Quizzes/ Final Exam
2.6	Calculate the magnetic field for various configurations.	S1	Lectures	Final Exam
2.7	Analyze the electrical and magnetic properties of materials influenced by electromagnetic fields.	S1	Lectures	Final Exam
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate a commitment to academic integrity and values by consistently engaging in ethical conduct throughout assessments.	V1	Lectures	Calculate the percentage of instances reflecting exemplary ethical behavior during assessments.

C. Course Content

No	List of Topics	Contact Hours
1.	Review of Vector Calculus	3
2.	Vectors Analysis	3
3.	Coordinate Systems and Transformation	3
4.	Electrostatic fields	3
5.	Coulomb's law	3
6.	Gauss law	3
7.	Energy and Potential	3
8.	Conductors, Dielectrics and Capacitance	3
9.	Poisson's and Laplace's Equations	3

10	Biot–Savart and Ampere's laws	3
11.	Magnetic Field Intensity	3
12.	Magnetic properties of materials	3
13.	Curl and Stoke's theorem	3
14.	Self and mutual inductances	3
15.	Energy in static Fields.	3
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes, Assignments	2-12	20%
2.	Midterm Exam 1	5-7	20%
3.	Midterm Exam 2	10-12	20%
4.	Final Exam	17	40%

*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	Fawwaz T. Ulaby "Fundamentals of Applied Electromagnetics", 8th Edition, 2015, Prentice Hall.
Supportive References	• Lecture Handouts • William Hayt and John Buck, "Engineering Electromagnetics", McGraw-Hill Series, 9th Edition, 2018.
Electronic Materials	Course Page on Blackboard
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Classroom**

Items	Resources
Technology equipment (projector, smart board, software)	**Data show, Blackboard Teaching-Learning Interface**
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 through survey**
Effectiveness of Students assessment	• **Students** • **Head of the department** • **Vice dean**	**Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary**
Quality of learning resources	**Students**	**Indirect through survey**
The extent to which CLOs have been achieved	**Course Instructor**	**Direct through tests**
Other	**None**	**None**

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1304/Semester-1/1445 H
DATE	10/10/2023

Course Specification

(Bachelor)

Course Title:	Electrical Circuit Lab
Course Code:	ELEN1305
Program:	Bachelor of Science in Electrical Engineering
Department:	Department of Electrical Engineering
College:	Faculty of Engineering
Institution:	University of Tabuk
Version:	4
Last Revision Date:	14 October 2023

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (1)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required			☐Elective	
3. Level/year at which this course is offered: (5th Level/ 3rd Year)					
4. Course general Description:					
This laboratory introduces the students to Laboratory Safety and lab regulations; Electric components; Electric equipment: sources, multimeters, oscilloscopes; Measuring electric circuit parameters; Verifying basic laws and theorems of DC circuits; Recording, evaluating, and analyzing experimental data; Measure time constant and rising time for first order circuit overshoot; Measure rising time, peak voltage and final voltage for second order circuit; Measuring waveform parameters; Measuring reactance and phase angle in RC and RL circuit; Use op-amp as Inverting amplifier, Non-inverting amplifier, Voltage follower, Differential amplifier, Integrator and differentiators.					
5. Pre-requirements for this course (if any)**:**					
6. Co-requisites for this course (if any)**:**					
ELEN1301: Electrical Circuits (2)					
7. Course Main Objective(s):					
To introduce students to Laboratory Safety, lab regulations and Electric circuits devices, Instruments and components; Measuring electric circuit parameters.					

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**	0
.2	**Laboratory/Studio**	45
.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	Demonstrate a comprehensive understanding of safety protocols specific to electrical engineering laboratories.	K1	Lectures	Exams
2.0	**Skills**			
2.1	Record, analyze and interpret experimental data.	**S3**	Experiment-based Learning	Exams and Reports
2.2	Connect electric circuits.	**S3**	Experiment-based Learning	Exams and Reports
2.3	Conduct experiments to measure electric circuit parameters and variables.	**S3**	Experiment-based Learning	Exams and Reports
2.4	Conduct experiments to measure waveform parameters.	**S3**	Experiment-based Learning	Exams and Reports

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.5	Conduct experiments to measure reactance and phase angle in RC and RL circuit and perform transient analysis of RLC circuit.	**S3**	Experiment-based Learning	Exams and Reports
2.6	Conduct experiments to use op-amp as Inverting amplifier, Non-inverting amplifier, Voltage follower, Differential amplifier, Integrator and differentiators.	**S3**	Experiment-based Learning	Exams and Reports
2.7	Develop an experiment to demonstrate knowledge of electric circuit concepts.	**S3**	Experiment-based Learning	Exams and Reports
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate effective teamwork skills by collaboratively engaging with peers during laboratory experiments to achieve successful outcomes.	V2	Experimental-based learning	Rubrics

C. Course Content

No	List of Topics	Contact Hours
1	Lab Safety and Introduction to circuit lab	3
2	Implementing simple circuit on breadboard	3
3	Resistor Color Code	3
4	Ohm's Law	3
5	Series circuits and Parallel circuits	3
6	Kirchhoff's laws	3
7	Series/parallel circuits	3
8	Oscilloscope Operation	3
9	Average and RMS Values	3
11	First Order Circuits and Second Order Circuits	3
12	Capacitors and Series RC Circuits	3

13	Inductors and Series RL Circuits	3
14	Op-amp circuits: Inverting amplifier, Non-inverting amplifier and voltage follower.	3
15	Op-amp circuits: Differential amplifier, Integrator and differentiators.	3
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Reports	Every week	30%
2.	Midterm	8	30%
.3	Final Exam	16	40%

*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	Charles K. Alexander, Matthew N. O. Sadiku, Fundamentals of Electric Circuits, 7th Edition, McGraw-Hill, 2021.
Supportive References	Lab assignments manual prepared by instructor.
Electronic Materials	Course Page on Blackboard
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Electric Circuit laboratory
Technology equipment (projector, smart board, software)	None
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	Indirect through survey
Effectiveness of Students assessment	• Students • Head of the department • Vice dean	Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary
Quality of learning resources	Students	Indirect through survey
The extent to which CLOs have been achieved	Course Instructor	Direct through tests
Other	None	None

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1305/Semester-1/1445 H
DATE	14/10/2023

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
(Bachelor)

Course Title:	Digital Design
Course Code:	ELEN1306
Program:	Bachelor of Science in Electrical Engineering
Department:	Department of Electrical Engineering
College:	Faculty of Engineering
Institution:	University of Tabuk
Version:	4
Last Revision Date:	30 October 2023

Table of Contents

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 Level/ 3rd Year)					
4. Course general Description:					
Numbering systems; Boolean algebra; Logic gates, Boolean functions; Design of combinational logic circuits: Digital comparator, encoder, decoder, multiplexer, de-multiplexer. Sequential circuits; Types of flip flops; R-S FF, J-K FF, D type FF, T type FF.					
5. Pre-requirements for this course (if any):					
ELEN1201: Electrical Circuits (1), ELEN1202: Engineering Analysis					
6. Co-requisites for this course (if any):					
None					
7. Course Main Objective(s):					
• Learn the types of numbering systems, • Solve Boolean algebra problems, • Discriminate between electronic logic families, • Perform combinational logic circuits, to minimize the Boolean 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**	39
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	0
5.	**Problem solving sessions**	6
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	Demonstrate a comprehensive Knowledge and understanding of digital design concepts.	K2	Lectures	Exams
2.0	**Skills**			
2.1	Solve problems related to numbering systems.	S1	Lectures and Problem-based learning	Quizzes/ Assignments/ Midterm-Final Exams
2.2	Derive and simplify Boolean functions and truth tables.	S1	Lectures and Problem-based learning	Quizzes/ Assignments/ Midterm-Final Exams
2.3	Perform logic gate level minimization methods.	S1	Lectures based Learning	Quizzes/ Assignments/ Midterm-Final Exams
2.4	Design combinational logic circuits.	S2	Lectures and Problem-based learning	Quizzes/ Assignments/ Midterm-Final Exams / Design Project
2.5	Analyze sequential logic circuits.	S1	Lectures and Problem-based learning	Quizzes/ Assignments/ Midterm-Final Exams

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.6	Validate the logic Design procedure using related software	S5	Project-based learning	Deliverables/ outcomes of the project
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate effective teamwork skills by collaborating with peers in the successful completion of projects.	V2	Project-based learning	Rubrics

C. Course Content

No	List of Topics	Contact Hours
1.	Numbering systems.	3
2.	Binary addition, subtraction, multiplication, and division.	3
3.	Boolean functions.	3
4.	Logic gates.	3
5.	Canonical and standard forms, minterms and maxterms.	3
6.	Map simplification, two variable map , and three variable map.	3
7.	Product of sums simplification.	3
8.	Design procedures.	3
9.	Adders (half adder, full adder) .	3
10.	Subtractors.	3
11.	Digital comparators.	3
12.	Decoders and encoders.	3
13.	Multiplexers, and de multiplexers.	3
14.	Sequential circuits	3
15.	flip flops.	3
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignments / Quizzes	3, 9, 14	20%
2.	Midterm Exam 1	8-10	25%

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
3.	Mini-Project	10-17	15%
4.	Final Exam	17-19	40%

*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	Digital Design (*), M. Moris Mano, Michel D. Ciletti, Pearson, McGraw-Hill; 5th edition, 2010
Supportive References	• Lecture Handouts
Electronic Materials	Course Page on Blackboard
Other Learning Materials	Logisim Digital Software Tool.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Classroom with 25 seats**
Technology equipment (projector, smart board, software)	**Data show, Blackboard Teaching-Learning Interface**
Other equipment (depending on the nature of the specialty)	**Reprographic facilities**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	**Students**	**Indirect through survey**
Effectiveness of Students assessment	• **Students** • **Head of the department** • **Vice dean**	**Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary**

Assessment Areas/Issues	Assessor	Assessment Methods
Quality of learning resources	Students	Indirect through survey
The extent to which CLOs have been achieved	Course Instructor	Direct through tests
Other	None	None

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1306/Semester-1/1445 H
DATE	30/10/2023

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
(Bachelor)

Course Title:	Signals and Systems
Course Code:	ELEN1307
Program:	Bachelor of Science in Electrical Engineering
Department:	Department of Electrical Engineering
College:	Faculty of Engineering
Institution:	University of Tabuk
Version:	4
Last Revision Date:	30 October 2023

Table of Contents

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: (6^{th} Level/ 3^{rd} Year)					
4. Course general Description:					
Elementary signals; signal operations; classification of signals; continuous and discrete time signals; Continuous and Discrete time system properties; LTI systems; impulse response; discrete and continuous time convolution; continuous time Fourier series; continuous time Fourier transform; Fourier transform properties; Laplace transform and properties, system modeling and transfer function; frequency response of Electric Circuits.					
5. Pre-requirements for this course (if any)**:**					
ELEN1201: Electric Circuits (1) , ELEN1202: Engineering Analysis					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
To equip students with the knowledge and skills to analyze and manipulate signals, understand the properties of systems, and perform frequency domain analysis.					

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**	39
.2	**Laboratory/Studio**	0
.3	**Field**	0
.4	**Tutorial**	0
.5	**Problem solving sessions**	6
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	Demonstrate a comprehensive Knowledge and understanding of signals and systems concepts.	K2	Lectures	Exams
2.0	**Skills**			
2.1	Apply fundamental operations, including integration, differentiation, scaling, and shifting, to analyze, classify, and calculate parameters such as power and energy for both continuous and discrete time signals.	**S1**	Lectures, and Problem-based learning.	Quizzes/ Assignments/ Exams
2.2	Identify the fundamental properties of both continuous and discrete time systems such as linearity, time-invariance,	**S1**	Lectures, and Problem-based learning.	Quizzes/ Assignments/ Exams

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	stability, and causality.			
2.3	Apply convolution to determine the time responses of LTI systems to input signals in both continuous and discrete time domains."	**S1**	Lectures, and Problem-based learning.	Quizzes/ Assignments/ Exams
2.4	Apply Fourier series to represent and decompose periodic signals into their harmonic components to continuous time signal.	**S1**	Lectures, and Problem-based learning.	Quizzes/ Assignments/ Exams
2.5	Apply the Fourier transform and its properties to investigate the spectral content of continuous-time signals.	**S1**	Lectures, and Problem-based learning.	Quizzes/ Assignments/ Exams
2.6	Analyze frequency response of continuous-time LTI system, electric circuits, and filters using Fourier Transform.	**S1**	Lectures, and Problem-based learning.	Quizzes/ Assignments/ Exams
2.7	Apply the Laplace transform and its inverse to determine the Laplace and time domain representation of signals and systems and to analyze the ROC, poles, and	**S1**	Lectures, and Problem-based learning.	Quizzes/ Assignments/ Exams

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	zeros and system stability.			
2.8	Utilize the Laplace Transform and its inverse to determine the transfer function and the response of electrical circuits.	**S1**	Lectures, and Problem-based learning.	Quizzes/ Assignments/ Exams
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate a commitment to academic integrity and values by consistently engaging in ethical conduct throughout assessments.	**V1**	Lectures	Calculate the percentage of instances reflecting exemplary ethical behavior during assessments.

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Signals and Systems	3
2.	Classification of Signals	3
3.	Basic Operations on Signals	3
4.	Elementary Continuous and Discrete Time Signals	3
5.	Continuous and Discrete Time System Properties	3
6.	Impulse Response and classification of LTI system	3
7.	Continuous Time Convolution	3
8.	Discrete Time Convolution	3
9.	Continuous Time Fourier Series	3

10.	Fourier Transform and its Properties	3
11.	Frequency Response of LTI systems and Electric Circuits and Filters	3
12.	Laplace Transform and its Properties	3
13.	Inverse Laplace Transform	3
14.	Analysis of Electric Circuits Using Laplace Transform	3
15.	System modeling and transfer function	3
	Total	**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	3,6,9,13,14	20%
2.	Midterm Exam 1	5-7	20%
3.	Midterm Exam 2	10-12	20%
.4	Final Exam	17-19	40%

*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	Signals and Systems, 2nd Edition, by Simon Haykin and Barry Van Veen.
Supportive References	• Lecture Handouts • Signals and Systems" by Alan V. Oppenheim, Alan S. Willsky, and S. Hamid Nawab.
Electronic Materials	Course Page on Blackboard
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom with 25 seats
Technology equipment (projector, smart board, software)	Data show, Blackboard Teaching-Learning Interface
Other equipment (depending on the nature of the specialty)	Reprographic facilities

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect through survey
Effectiveness of Students assessment	• Students • Head of the department • Vice dean	Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary
Quality of learning resources	Students	Indirect through survey
The extent to which CLOs have been achieved	Course Instructor	Direct through tests
Other	None	None

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1307/Semester-1/1445 H
DATE	30/10/2023

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023

TP-153

Course Specification

(Bachelor)

Course Title: Electronics (2)	
Course Code: ELEN1308	
Program: Bachelor of Science in Electrical Engineering	
Department: Department of Electrical Engineering	
College: Faculty of Engineering	
Institution: University of Tabuk	
Version: 4	
Last Revision Date: 10 October 2023	

Table of Contents

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: (6th Level/ 3rd Year)					
4. Course general Description:					
Metal Oxide Field Effect Transistors (MOSFET): Device Structure and Physical Operation, Regions of Operation, Current–Voltage Characteristics, DC (large signal) analysis and AC (small signal) analysis of FET circuits including input/output resistance, and current and voltage gain; Differential amplifiers, current mirrors, multistage cascade, and cascode configurations; Frequency response: miller effect, stability, poles, zeros, and Bode plot; Negative and positive feedback.					
5. Pre-requirements for this course (if any)**:**					
ELEN 1301: Electrical Circuits (2), ELEN1302: Electronics I					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
Upon completion of this course the students will be able to analyze FET amplifier biasing networks; small-signal equivalent circuits; single and multi-stage small-signal amplifiers; Frequency response; negative feedback amplifiers.					

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**	39
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	0
5.	**Problem solving sessions**	6
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	Demonstrate understanding of positive and negative feedback in amplifier design	**K2**	Lectures	Quizzes/ Exams
2.0	**Skills**			
2.1	Perform large signal analysis (DC Analysis) for Field Effect Transistors	**S1**	Lectures and Problem-based Learning	Quizzes/ Midterm Exam
2.2	Perform small signal analysis (AC Analysis) for FET amplifier circuits.	**S1**	Lectures and Problem-based Learning	Quizzes/ Midterm Exam
2.3	Analyze differential amplifier	**S1**	Lectures and Problem-based Learning	Quizzes/ Midterm Exam
2.4	Analyze multistage amplifier	**S1**	Lectures and Problem-based Learning	Quizzes/ Midterm Exam
2.5	Analyze frequency response of amplifiers	**S1**	Lectures and Problem-based Learning	Quizzes/ Final Exam
2.6	Engage in a collaborative mini project to develop a practical electronic system that fosters hands-on application of learned concepts.	**S2**	Project-based learning	Deliverables/ outcomes of the project
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate a commitment to academic	V1	Lectures	Calculate the percentage of

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	integrity and values by consistently engaging in ethical conduct throughout assessments.			instances reflecting exemplary ethical behavior during assessments.

C. Course Content

No	List of Topics	Contact Hours
1.	Metal Oxide Field Effect Transistors (MOSFET): Device Structure and Physical Operation.	3
2.	Metal Oxide Field Effect Transistors (MOSFET): Regions of Operation, Current–Voltage Characteristics.	3
3.	DC (large signal) analysis of FET circuits.	3
4.	AC (small signal) analysis of FET circuits: input/output resistance.	3
5.	AC (small signal) analysis of FET circuits: current and voltage gain.	3
6.	Differential amplifiers.	3
7.	Current Mirrors.	3
8.	Multistage cascade configuration	3
9.	Multistage cascode configurations.	3
10.	Frequency response: miller effect.	3
11.	Frequency response: stability, poles, zeros, and Bode plot.	3
12.	Analysis of amplifier.	3
13.	Analysis of multistage amplifier.	3
14.	Negative and positive feedback: Properties, Frequency response of the op-amp, gain-bandwidth product limitation, topologies	3
15.	Negative and positive feedback: Study of Series-Shunt feedback Amplifier	3
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	4,8,11,14	20%
2.	Midterm Exam 1	8-9	25%
3.	Mini-Project	10-17	15%
4.	Final Exam	18	40%

*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	Microelectronics Circuit Analysis and Design, Donald A Neaman, 4th ed.
Supportive References	• Lecture Handouts • Microelectronic Circuits – Sedra & Smith, Oxford University Press, 6th Edition5
Electronic Materials	Course Page on Blackboard
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Classroom with 25 seats**
Technology equipment (projector, smart board, software)	**Data show, Blackboard Teaching-Learning Interface**
Other equipment (depending on the nature of the specialty)	**Reprographic facilities**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect through survey
Effectiveness of Students assessment	• Students • Head of the department • Vice dean	Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary
Quality of learning resources	Students	Indirect through survey
The extent to which CLOs have been achieved	Course Instructor	Direct through tests
Other	None	None

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

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1308/Semester-1/1445 H
DATE	10/10/2023

2023
TP-153

Course Specification

(Bachelor)

Course Title: Electromagnetics (2)	
Course Code: ELEN1309	
Program: Bachelor of Science in Electrical Engineering	
Department: Department of Electrical Engineering	
College: Faculty of Engineering	
Institution: University of Tabuk	
Version: 4	
Last Revision Date: 10 October 2023	

Table of Contents

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: (6th Level/ 3th Year)					
4. Course general Description:					
Time varying fields; Faraday's law: Transformer and motional emfs; Displacement current; Maxwell's equations and time harmonic fields; Transmission lines; Standing waves and reflection coefficient; Impedance matching; Wave equation; Power transfer and Pointing vector; Plane wave propagation: in free space, in lossy dielectrics and in good conductors; Reflection of plane wave; Introduction to radiation and antennas.					
5. Pre-requirements for this course (if any):					
ELEN1304: Electromagnetics (1)					
6. Co-requisites for this course (if any):					
None					
7. Course Main Objective(s):					
This course presents the physics and theory of time-varying electromagnetic waves.					

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**	39
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	0
5.	**Problem solving sessions**	6
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	Demonstrate a comprehensive Knowledge and understanding of electromagnetics concepts.	K1	Lectures	Exams
2.0	**Skills**			
2.1	Extract the wave properties from the wave equation.	S1	Lectures and Problem-based learning	Quizzes/ Assignments/ Midterm-Final Exams
2.2	Calculate transmission line parameters, reflection coefficient ratio, standing wave ratio, and power flow.	S1	Lectures and Problem-based learning	Quizzes/ Assignments/ Midterm-Final Exams
2.3	Design impedance matching using lumped elements or shorted-stub methods via the Smith Chart.	S2	Lectures and Problem-based learning	Assignments/ Midterm-Final Exams

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.4	Apply Faraday's law to analyze transformer and motional electromotive forces.	S1	Lectures and Problem-based learning	Quizzes/ Assignments/ Midterm-Final Exams
2.5	Analyze wave propagation within and between different media.	S1	Lectures and Problem-based learning	Quizzes/ Assignments/ Midterm-Final Exams
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate a commitment to academic integrity and values by consistently engaging in ethical conduct throughout assessments.	V1	Lectures	Calculate the percentage of instances reflecting exemplary ethical behavior during assessments.

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction of Electrostatics and Magnetostatics	3
2.	Electromagnetics wave properties	3
3.	Transmission lines: equations, wave propagation.	3
4.	Lossless transmission line: voltage reflection coefficient and standing waves.	3
5.	Power flow on a lossless transmission line	3
6.	The Smith chart.	3
7.	Impedance matching techniques using Smith Chart	3
8.	Maxwell’s equations for time-varying fields: Faraday's law, Stationary loop	3
9.	Maxwell’s equations for time-varying fields: Moving Conductor, Displacement current.	3
10.	Maxwell’s equations for time-varying fields: Boundary conditions, charge-current continuity relation, free-charge dissipation in a conductor	3
11.	Maxwell’s equations for time-varying fields: Electromagnetic Potential.	3
12.	Plane wave propagation: Time-harmonic fields, Wave Polarization	3
13	Plane wave propagation: Wave Polarization	3
14.	Plane wave propagation in lossless and lossy media	3
15.	Plane wave propagation: Electromotive power density	3

Total	45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes, Assignments	2-12	20%
2.	Midterm Exam 1	5-7	20%
3.	Midterm Exam 2	10-12	20%
4.	Final Exam	17	40%

*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	Fawwaz T. Ulaby "Fundamentals of Applied Electromagnetics", 8th Edition, 2015, Prentice Hall.
Supportive References	• Lecture Handouts • William Hayt and John Buck, "Engineering Electromagnetics", McGraw-Hill Series, 9th Edition, 2018.
Electronic Materials	Course Page on Blackboard
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Classroom**
Technology equipment (projector, smart board, software)	**Data show, Blackboard Teaching-Learning Interface**
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 through survey
Effectiveness of Students assessment	• Students • Head of the department • Vice dean	Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary
Quality of learning resources	Students	Indirect through survey
The extent to which CLOs have been achieved	Course Instructor	Direct through tests
Other	None	None

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1309/Semester-1/1445 H
DATE	10/10/2023

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023

TP-153

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Course Specification

(Bachelor)

Course Title:	Electrical Data Networks
Course Code:	ELEN1310
Program:	Bachelor of Science in Electrical Engineering
Department:	Department of Electrical Engineering
College:	Faculty of Engineering
Institution:	University of Tabuk
Version:	1
Last Revision Date:	14 October 2023

Table of Contents

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: (6th Level/ 3rd Year)					
4. Course general Description:					

This Course provided students with the fundamentals of data structures and algorithms and the fundamentals of computer networking. This course covers the principles of a number of data structures, including array, array list, stack, queue, linked list, tree, and graph. This course also covers time complexity analysis of algorithms using Big O notation. This course provides students with a proper grounding in the fundamentals of computer networking. Also, the course will cover classic concepts of computer networking such as Internet architecture, naming and addressing, routing, forwarding, reliability, flow control, congestion control, and socket programming.

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

ELEN1202: Engineering Analysis ,CSC1103: Introduction to Programming

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

7. Course Main Objective(s):

- To introduce data abstraction and data representation in memory
- To describe and use elementary data structures such as stack, queue, linked list, tree and graph
- To introduce algorithms and their complexity
- To introduce fundamentals of computer networks, main protocols and applications of the Internet.

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	Choose an appropriate data structure such as stack, queue, binary tree, or graph required to solve a problem.	**K2**	Lecture Based Learning	Quizzes/Assignments/ Exams
1.2	Recognize the theory, algorithm and design of algorithmic solutions.	**K2**	Lecture Based Learning	Quizzes/Assignments/ Exams
1.3	Understand the architectural principles underlying the Internet design.	**K2**	Lecture Based Learning	Quizzes/Assignments/ Exams
1.4	understand the design of various layers in the	**K2**	Lecture Based Learning	Quizzes/Assignments/ Exams

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	network stack, including datalink layer, network layer, transport layer, and application layer			
2.0	**Skills**			
2.1	Employ mathematics in the solution of computing problems	**S1**	Lecture Based Learning	Quizzes/Assignments/ Exams
2.2	Select an appropriate data structure such as stack, queue, binary tree, or graph required to solve a problem	**S1**	Lecture Based Learning	Quizzes/Assignments/ Exams
2.3	Identify the theory, algorithm and design of algorithmic solutions	**S1**	Lecture Based Learning	Quizzes/Assignments/ Exams
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate a commitment to academic integrity and values by consistently engaging in ethical conduct throughout assessments.	**V1**	Lectures	Calculate the percentage of instances reflecting exemplary ethical behavior during assessments.

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to Data Structures	3
2	Generic Types and Algorithm Efficiency	3
3	Recursive Functions	3
4	Sorting Algorithms	3
	Searching	3
5	Arrays and Linked List	3
6	Stack and Queue	3
7	Tree	3
8	Graph	3
9	Introduction to computer networks	3
11	Internet Architecture Principles	3

12	Data Link Layer - MAC Addressing, ARP, CSMA/CD, Switched Ethernet, MAC Learning, STP	3
13	Network Layer - IP Addressing, NAT, IP Forwarding, Distance Vector, Link State, BGP, DNS	3
14	Network Layer - Distance Vector, Link State, BGP, DNS	3
15	Transport Layer - UDP, TCP Reliability, TCP Flow Control, TCP Congestion Control	3
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Class Works (Class Activities, Quizzes, Homework)	Every week	20%
2.	Mid-Term Exam -1	6-7	20%
3.	Mid-Term Exam-2	11-12	20%
4.	Final Exam	16	40%

*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	• Introduction to Algorithms, Tomas H. Cormen et al., MIT press, 3rd edition, 2009, ISBN 978-0262033848. • Computer Networking: A Top-Down Approach Featuring the Internet, Seventh Edition, James Kurose and Keith Ross, Addison Wesley, 2017.
Supportive References	
Electronic Materials	Course Page on Blackboard
Other Learning Materials	Handouts

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Classroom (50 seats)**
Technology equipment (projector, smart board, software)	**White board, Data show 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	Students	Indirect through survey
Effectiveness of Students assessment	• Students • Head of the department • Vice dean	Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary
Quality of learning resources	Students	Indirect through survey
The extent to which CLOs have been achieved	Course Instructor	Direct through tests
Other	None	None

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1310/Semester-1/1445 H
DATE	14/10/2023

Course Specification

(Bachelor)

Course Title: Digital Design Lab	
Course Code: ELEN1311	
Program: Bachelor of Science in Electrical Engineering	
Department: Department of Electrical Engineering	
College: Faculty of Engineering	
Institution: University of Tabuk	
Version: 4	
Last Revision Date: 14 October 2023	

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (1)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (6th Level/ 3th Year)					
4. Course general Description:					
The laboratory exercises are designed to give students the ability to design, build, and implement digital circuits and systems. Laboratory assignments progress from investigation of the properties of basic logic gates (AND, OR,NAND, NOR and XOR), Decoders to the design of combinational circuits.					
5. Pre-requirements for this course (if any)**:**					
ELEN1305: Electrical Circuits Laboratory, ELEN1306: Digital Design.					
6. Co-requisites for this course (if any)**:**					
7. Course Main Objective(s):					
To provide students with hand-on experience in designing and implementing digital/logic 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**	0
.2	**Laboratory/Studio**	45
.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	Demonstrate a comprehensive understanding of safety protocols specific to electrical engineering laboratories.	K2	Lectures	Exams
2.0	**Skills**			
2.1	Conduct experiments to implement basic combinational logic circuits.	**S3**	Experiment-based Learning	Exams and Reports
2.2	Conduct experiments to simplify and implement logic circuits using Karnaugh-Map and NAND realization.	**S3**	Experiment-based Learning	Exams and Reports
2.3	Conduct experiments to implement binary adders, subtractors, BCD adder/ subtractor circuits	**S3**	Experiment-based Learning	Exams and Reports
2.4	Record, analyze and interpret experimental data.	**S3**	Experiment-based Learning	Exams and Reports

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
3.0	Values, autonomy, and responsibility			
3.1	Demonstrate effective teamwork skills by collaboratively engaging with peers during laboratory experiments to achieve successful outcomes.	V2	Experimental-based learning	Rubrics

C. Course Content

No	List of Topics	Contact Hours
1	Lab safety	3
2	Introduction to Hardware.	3
3	The Input-Control/Output-Display Unit (ICOD).	3
4	Study Basic gates: INV, AND, OR, NAND.	3
5	Study Basic gates: NOR, XOR, XNOR	3
6	Realization of logic functions using NAND Gate	3
7	Realization of logic functions using NOR Gate	3
8	Simplification-using-Karnaugh-Map	3
9	Simplification-using-Nand realization	3
10	Binary Addition and Subtraction	3
11	Multiplexers and Demultiplexers	3
12	BCD adder and comparators	3
13	Implement function using Decoders	3
14	Implement function using Encoders	3
15	Latches and Flip Flop	3
Total		45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Reports and Prelab Reports	Every week	34%
2.	Midterm	8	30%
.3	Final Exam	16	36%

*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	Digital Design (*), M. Moris Mano, Michel D. Ciletti, Pearson, McGraw-Hill; 5th edition, 2010
Supportive References	Lab assignments manual prepared by instructor.
Electronic Materials	Course Page on Blackboard
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Digital Logics laboratory
Technology equipment (projector, smart board, software)	None
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	Indirect through survey
Effectiveness of Students assessment	• Students • Head of the department • Vice dean	Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary
Quality of learning resources	Students	Indirect through survey
The extent to which CLOs have been achieved	Course Instructor	Direct through tests
Other	None	None

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1311/Semester-1/1445 H
DATE	14/10/2023

Course Specification

(Bachelor)

Course Title: Electronics Lab	
Course Code: ELEN1312	
Program: Bachelor of Science in Electrical Engineering	
Department: Department of Electrical Engineering	
College: Faculty of Engineering	
Institution: University of Tabuk	
Version: 4	
Last Revision Date: 14 October 2023	

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (1)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (6th Level/ 3rd Year)					
4. Course general Description:					
This laboratory introduces the students to the practical implementation of electronic circuits including various diodes and Transistors types; this include driving silicon diode characteristics, LED characteristics, Zener characteristics, BJT Transistor characteristics, MOSFET Transistor characteristics, and build half wave and full wave rectification circuits.					
5. Pre-requirements for this course (if any):					
ELEN1305: Electrical Circuits Laboratory					
6. Co-requisites for this course (if any):					
ELEN1307: Electronics (2)					
7. Course Main Objective(s):					
To provide students with hand-on experience in designing and implementing electronic 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**	0
.2	**Laboratory/Studio**	45
.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	Demonstrate a comprehensive understanding of safety protocols specific to electrical engineering laboratories.	K2	Lectures	Exams
2.0	**Skills**			
2.1	Show effectively experimental findings by writing laboratory reports.	**S3**	Experiment-based Learning	Exams and Reports
2.2	Conduct experiments to get characteristics of various types of diodes.	**S3**	Experiment-based Learning	Exams and Reports
2.3	Conduct experiments to perform rectification function (half and full wave rectification).	**S3**	Experiment-based Learning	Exams and Reports
2.4	Conduct experiments to get characteristics of BJT Transistor and MOSFET Transistor.	**S3**	Experiment-based Learning	Exams and Reports

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.5	Conduct experiments to calculate the amplification factor (Beta), voltage amplification Gain, Input and output impedances of BJT NPN Transistor.	**S3**	Experiment-based Learning	Exams and Reports
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate effective teamwork skills by collaboratively engaging with peers during laboratory experiments to achieve successful outcomes.	V2	Experimental-based learning	Rubrics

C. Course Content

No	List of Topics	Contact Hours
1	Lab Safety and Identification of circuit components	3
2	V-I characteristics of diode	3
3	V-I characteristics OF Zener diode	3
4	V-I characteristics OF LED diode	3
5	Half wave rectifier	3
6	Full wave rectifier	3
7	Common emitter characteristics of npn	3
8	Common base characteristics of npn	3
9	Common collector characteristics of npn	3
11	Common - emitter transistor amplifier	3
12	Common-base transistor amplifier	3
13	Emitter-follower transistor amplifier	3
14	MOSFET characteristics.	3
15	Common-source and source follower transistor amplifier	3
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Reports and Pre-Lab Reports	Every week	35%
2.	Midterm	8	30%
.3	Final Exam	16	35%

*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	Microelectronics Circuit Analysis and Design, Donald A Neaman, 4th ed..
Supportive References	Lab assignments manual prepared by instructor
Electronic Materials	Course Page on Blackboard
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Electronics laboratory
Technology equipment (projector, smart board, software)	None
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	Indirect through survey
Effectiveness of Students assessment	• Students • Head of the department • Vice dean	Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet

Assessment Areas/Issues	Assessor	Assessment Methods
		with instructors and provide feedback when necessary
Quality of learning resources	Students	Indirect through survey
The extent to which CLOs have been achieved	Course Instructor	Direct through tests
Other	None	None

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1312/Semester-1/1445 H
DATE	14/10/2023

2023
TP-153

Course Specification
(Bachelor)

Course Title:	Probabilistic Methods in Electrical Engineering
Course Code:	ELEN1401
Program:	Bachelor of Science in Electrical Engineering
Department:	Department of Electrical Engineering
College:	Faculty of Engineering
Institution:	University of Tabuk
Version:	4
Last Revision Date:	30 October 2023

Table of Contents

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: (7^{th} Level/ 4^{th} Year)					
4. Course general Description:					
Fundamentals of probability theory: Axioms of probability, Discrete probability Law, Continuous Probability, Joint, Conditional, and Total Probabilities, Baye's Rule, Independent and Mutually Exclusive Events, Bernoulli Trials; Continuous and Discrete Random Variables: Probability Mass Function (PMF), Probability Density Function (PDF), Cumulative distribution Function (CDF), Common Distribution Functions, Bernoulli, Binomial, Uniform, Exponential, and Gaussian or Normal RVs; Operations on RV's: Expectation, Moments, Variance, Skewness, Characteristic Function, Function of RV; Multiple Continuous and Discrete RV's: Joint PMF, PDF, and CDF, Independent RV's, Expected value in case of multiple RVs, Joint Moments, Covariance, Correlation Coefficient, Central Limit Theorem; Random processes: Ensemble Average and Time Average, Distribution and Density functions of RP, Stationarity, Autocorrelation and Power Spectral Density, Power calculations, Wide Sense Stationary (WSS) Process, Ergodicity, White Noise and Gaussian Random Process, White Gaussian Noise, Linear Time-Invariant (LTI) system with Random input.					
5. Pre-requirements for this course (if any)**:**					
ELEN1307: Signals and Systems, MATH1216: Multivariate Calculus					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
This course familiarizes the students with the concepts of probability theory, random variables and standard distributions as well as the methods and tools used to analyze random signals and systems handling random signals.					

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	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	Demonstrate a comprehensive Knowledge and understanding of probability and random process concepts.	K2	Lectures	Exams
2.0	**Skills**			
2.1	Apply fundamental probability laws to determine the marginal, conditional, joint, and total probabilities of discrete and continuous events.	**S1**	Lectures, and Problem-based learning.	Quizzes/ Assignments/ Exams

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.2	Formulate discrete random variables describing a given random experiment and derive the mass (PMF) and distribution (CDF) functions.	**S1**	Lectures and Problem-based learning	Quizzes/ Assignments/ Exams
2.3	Analyze the density (PDF) and distribution (CDF) functions of a continuous random variables, including common probability mass and distribution functions (RVs).	**S1**	Lectures and Problem-based learning	Quizzes/ Assignments/ Exams
2.4	Derive probability density functions (PDFs) when performing random variable transformations.	**S1**	Lectures and Problem-based learning	Quizzes/ Assignments/ Exams
2.5	Analyze PMF, PDF, and CDF for multiple continuous and discrete random variables.	**S1**	Lectures and Problem-based learning	Quizzes/ Assignments/ Exams
2.6	Perform operations on both continuous and discrete random variables, including calculations of moments, central moments, covariance, and correlation coefficient.	**S1**	Lectures and Problem-based learning	Quizzes/ Assignments/ Exams
2.7	Analyze random processes, focusing on essential elements such as stationarity, ergodicity, autocorrelation functions, and power spectral density.	**S1**	Lectures and Problem-based learning	Quizzes/ Assignments/ Exams

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.8	Perform calculations related to white and Gaussian noise when subjected to a linear time-invariant systems.	**S1**	Lectures and Problem-based learning	Quizzes/ Assignments/ Exams
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate a commitment to academic integrity and values by consistently engaging in ethical conduct throughout assessments.	**V1**	Lectures	Calculate the percentage of instances reflecting exemplary ethical behavior during assessments.

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction, sets, and set operation	3
2.	Fundamentals of Probability Theory (Axioms of Probability), Discrete Probability Law, Continuous Probability	3
3.	Joint, Conditional, and Total Probabilities, and Bayes' Rule	3
4.	Independent and Mutually Exclusive Events, Bernoulli Trials	3
5.	Probability Mass Function (PMF), Probability Density Function (PDF), and Cumulative Distribution Function (CDF)	3
6.	Common Probability Distributions (Bernoulli, Binomial, Uniform, Exponential, and Gaussian RVs)	3
7.	Operations on Random Variables (Expectation, Moments, Variance, Skewness, Characteristic Function)	3
8.	Function of Random Variables	3
9.	Multiple Discrete Random Variables: Joint, Marginal, and Conditional PMFs	3
10.	Multiple Continuous Random Variables PDF, and CDF, Independent RVs.	3

11.	Expected Value in the Case of Multiple Random Variables, Joint Moments, Covariance, and Correlation Coefficient	3
12.	Random Processes (Ensemble Average, Time Average, Distribution and Density functions of RP, Stationarity, WSS Process, Ergodicity)	3
13.	Autocorrelation function and Power Spectral Density	3
14.	White Noise, Gaussian Random Process, White Gaussian Noise,	3
15.	Linear Time-Invariant (LTI) system with Random input and Power and probability calculations	3
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	3,6,9,13,14	20%
2.	Midterm Exam 1	5-7	20%
3.	Midterm Exam 2	10-12	20%
.4	Final Exam	17-19	40%

*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	Peebles, P. Z. “Probability, Random Variables, and Random Signal Principles”, McGraw-Hill, 4th Edition, 2001.
Supportive References	• Lecture Handouts • Leon-Garcia, A. “Probability and Random Processes for EE”, Addison Wesley, 2nd Edition, 1994.
Electronic Materials	Course Page on Blackboard
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom with 25 seats
Technology equipment (projector, smart board, software)	Data show, Blackboard Teaching-Learning Interface
Other equipment (depending on the nature of the specialty)	Reprographic facilities

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect through survey
Effectiveness of Students assessment	• Students • Head of the department • Vice dean	Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary
Quality of learning resources	Students	Indirect through survey
The extent to which CLOs have been achieved	Course Instructor	Direct through tests
Other	None	None

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1401/Semester-1/1445 H
DATE	30/10/2023

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification

(Bachelor)

Course Title:	Electrical Machines
Course Code:	ELEN1402
Program:	Bachelor of Science in Electrical Engineering
Department:	Department of Electrical Engineering
College:	Faculty of Engineering
Institution:	University of Tabuk
Version:	4
Last Revision Date:	29 October 2023

Table of Contents

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: (7^{th} Level/ 4^{th} Year)					
4. Course general Description:					
Basic principles of electrical machines and energy conversion, magnetic circuits, principles and operation of single phase and three-phase transformers, principles, operation, key characteristics and applications of three phase induction motors, introduction to DC machines and synchronous generators.					
5. Pre-requirements for this course (if any)**:**					
ELEN1301 Electrical Circuits II , ELEN1309 Electromagnetics II					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
• **To clearly understand the basic concepts of the electrical machines working** in the modern power system. • To model and analyze various types of generators and motors.					

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**	39
.2	**Laboratory/Studio**	0
.3	**Field**	0
.4	**Tutorial**	0
.5	**Problem solving sessions**	6
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	Demonstrate understanding of DC machine operation and construction principles.	K3	Lectures	Quizzes/ Midterm and Final Exam
2.0	**Skills**			
2.1	Analyze magnetic circuits.	S1	Lectures and Problem-based learning	Quizzes/ Assignments/ Midterm Exam
2.2	Analyze single-phase transformers, including equivalent circuits, regulation, efficiency, and performance under open and short circuit tests.	S1	Lectures and Problem-based learning	Quizzes/ Assignments/ Midterm Exam
2.3	Analyze three-phase transformers, considering equivalent circuits, various connections, and autotransformers.	S1	Lectures and Problem-based learning	Quizzes/ Assignments/ Final Exam
2.4	Solve problems related to synchronous machines.	S1	Lectures and Problem-based learning	Quizzes/ Assignments/ Final Exam

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.5	Solve problems related to induction motors.	S1	Lectures and Problem-based learning	Quizzes/ Assignments/ Final Exam
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate a commitment to academic integrity and values by consistently engaging in ethical conduct throughout assessments.	V1	Lectures	Calculate the percentage of instances reflecting exemplary ethical behavior during assessments.

C. Course Content

No	List of Topics	Contact Hours
1.	Ohm's law for magnetic circuits - Magnetic circuits with air gap- Energy losses in a ferromagnetic core.	3
2.	Characteristics of ideal transformer.	3
3.	Exact equivalent circuit of a practical transformer.	3
4.	Approximate equivalent circuit of a practical transformer.	3
5.	Determination of Equivalent Circuit Parameters of a practical transformer.	3
6.	Efficiency and voltage regulation of a practical transformer.	3
7.	Autotransformer - Three-phase transformers.	3
8.	Rotating Machines basics.	3
9.	Induction motor theory.	3
10	Equivalent circuit of an induction motor.	3
11.	Determination of equivalent circuit parameters of an induction motor.	3
12.	Principles of operation, construction, and equivalent circuits of synchronous generators.	3
13.	Separately Excited DC machines.	3
14.	Shunt (Self-Excited) DC machines Compound DC Machines.	3
15.	Series DC Machines.	3
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	3,6,9,13,14	20%
2.	Midterm Exam 1	5-7	20%
.3	Midterm Exam 2	10-12	20%
.4	Final Exam	12	40%

*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	Paresh C. Sen, “Principles of Electric Machines and Power Electronics”, Wiley John Wiley & Sons, Third Edition, 2014.
Supportive References	• Lecture Handouts • Stephen J. Chapman, “Electric Machinery Fundamentals”, McGraw-Hill, Fifth Edition, 2012.
Electronic Materials	Course Page on Blackboard
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Classroom with 25 seats**
Technology equipment (projector, smart board, software)	**Data show, Blackboard Teaching-Learning Interface**
Other equipment (depending on the nature of the specialty)	**Reprographic facilities**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect through survey

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of Students assessment	• Students • Head of the department • Vice dean	Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary
Quality of learning resources	Students	Indirect through survey
The extent to which CLOs have been achieved	Course Instructor	Direct through tests
Other	None	None

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1402/Semester-1/1445 H
DATE	29/10/2023

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
(Bachelor)

Course Title:	Control Systems
Course Code:	ELEN1403
Program:	Bachelor of Science in Electrical Engineering
Department:	Department of Electrical Engineering
College:	Faculty of Engineering
Institution:	University of Tabuk
Version:	4
Last Revision Date:	26 October 2023

Table of Contents

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: (7th Level/ 4th Year)					
4. Course general Description:					
Basics of control systems, modeling of electrical/mechanical systems, block diagrams, signal flow graph, initial and final value theorems, steady state error analysis, system orders, transient and steady-state responses, stability analysis, proportional-integral-derivative (PID) control systems.					
5. Pre-requirements for this course (if any)**:**					
ELEN1303: Engineering Computations, ELEN1307: Signals and Systems					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
To understand the fundamentals of control systems, study of steady state errors, stability analysis, PID controller and its application using MATLAB.					

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**	39
.2	**Laboratory/Studio**	0
.3	**Field**	0
.4	**Tutorial**	0
.5	**Problem solving sessions**	6
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	Demonstrate knowledge of PID control systems.	**K3**	Lectures	Quizzes/ Assignments/ Final Exam
2.0	**Skills**			
2.1	Apply fundamental laws of physics to model systems.	**S1**	Lectures and Problem-based learning	Quizzes/ Assignments/ Midterm and final Exams
2.2	Derive system transfer functions and analyze system output responses.	**S1**	Lectures and Problem-based learning	Quizzes/ Assignments/ Midterm and final Exams
2.3	Represent control systems using block diagrams and signal flow graphs.	**S1**	Lectures and Problem-based learning	Quizzes/ Midterm and Final Exam
2.4	Analyze the characteristics of feedback control systems and steady state error.	**S1**	Lectures and Problem-based learning	Quizzes/ Assignments/ Midterm and final Exams
2.5	Apply Routh-Hurwitz criterion to determine stability requirements in control systems design.	**S2**	Lectures and Problem-based learning	Quizzes/ Assignments/ Midterm and final Exams

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.6	Utilize MATLAB in a mini project to study and evaluate the impact of PID controllers on control system performance.	**S5**	Project-Based Learning	Deliverables/ outcomes of the project
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate effective teamwork skills by collaborating with peers in the successful completion of projects.	V2	Project-based learning	Rubrics

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to control systems	3
2.	Review of the basic issues in Laplace transform. • Laplace transformation. • Laplace transformation theorems. • Inverse Laplace transformation. • Solving linear differential equations.	3
3.	Block diagram models and transfer functions	3
4.	Simplification of block diagrams of control systems.	3
5.	Mathematical Modeling of mechanical dynamic systems.	3
6.	Mathematical Modeling of electrical circuits.	3
7.	Feedback Control Systems Characteristics • Typical Test Signals for Time Response of Control Systems. • Classification of Feedback Control Systems by Type.	3
8.	Analysis of Steady State Errors of Linear Systems.	3
9.	Transient response of first order systems	3

10.	Performance of feedback control systems for Second-Order Systems	3
11.	Stability of Linear Systems • Concepts of stability. • Effects of pole locations in s-plane on stability of control systems.	3
12.	The Routh-Hurwitz Stability Criterion	3
13.	PID Controller.	3
14.	The effects of parameters of PID controller on control systems.	3
15.	Utilize simulation tools (MATLAB) to evaluate the impact of PID parameters on the control system .	3
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes and Assignments	3,5,9,13,14	20%
2.	Midterm Exam 1	8-9	25%
3.	Mini-project	10-17	15%
.4	Final Exam	18	40%

*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	Modern Control Engineering, Katsuhiku Ogata, Pearson, 5th edition, 2009.
Supportive References	• Lecture Handouts • Modern Control Systems, Richard C. Dorf and Robert Bishop, Pearson, 11th edition, 2008.
Electronic Materials	Course Page on Blackboard
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities	**Classroom with 25 seats**

Items	Resources
(Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	
Technology equipment (projector, smart board, software)	**Data show, Blackboard Teaching-Learning Interface**
Other equipment (depending on the nature of the specialty)	**Reprographic facilities**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	**Students**	**Indirect through survey**
Effectiveness of Students assessment	• **Students** • **Head of the department** • **Vice dean**	**Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary**
Quality of learning resources	**Students**	**Indirect through survey**
The extent to which CLOs have been achieved	**Course Instructor**	**Direct through tests**
Other	**None**	**None**

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1403/Semester-1/1445 H
DATE	26/10/2023

2023
TP-153

Course Specification

(Bachelor)

Course Title: Instrumentation and Measurements	
Course Code: ELEN1404	
Program: Bachelor of Science in Electrical Engineering	
Department: Department of Electrical Engineering	
College: Faculty of Engineering	
Institution: University of Tabuk	
Version: 4	
Last Revision Date: 26 October 2023	

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (2)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required			☐Elective	
3. Level/year at which this course is offered: (7th Level/ 4th Year)					
4. Course general Description:					
Fundamentals of measurements; Instrument types; Performance characteristics: accuracy, precision, sensitivity, resolution, hysteresis, etc.; Measurement errors: systematic and random errors; Signal Conditioning: OP-amp, amplifiers, filters, integrator, etc.; Sensors: displacement, temperature, flow, capacitive, light, etc.; Digital to analog and analog to digital converters; Digital voltmeter; oscilloscopes.					
5. Pre-requirements for this course (if any)**:**					
ELEN1309: Digital Design					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
To provide an introduction to the field of Measurements and Instrumentation and covers various sensors, their characteristics and their applications in the instruments.					

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**	26
.2	**Laboratory/Studio**	0
.3	**Field**	0
.4	**Tutorial**	0
.5	**Problem solving sessions**	4
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	Explain fundamentals of measurements.	K2	Lecture	Quizzes/ Exams
1.2	Demonstrate the knowledge of types of sensors and their characteristics, operation, and applications.	K2	Lecture	Quizzes /Exams
1.3	Demonstrate the knowledge of digital voltmeter and oscilloscopes.	K2	Lecture	Exams
2.0	**Skills**			
2.1	Analyze measurement errors.	S1	Lectures, Problem-based learning	Quizzes/ Exams
2.2	Design interfacing and signal Conditioning circuits	S2	Lectures, Problem-based learning	Quizzes/ Exams
2.3	Design analog to digital and digital to analog converters.	S2	Lectures, Problem-based learning	Quizzes/ Exams
2.4	Engage in a collaborative mini project to develop a practical measurement system that fosters	**S2**	Project-based learning	Deliverables/ outcomes of the project

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	hands-on application of learned concepts.			
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate effective teamwork skills by collaborating with peers in the successful completion of projects.	V2	Project-based learning	Rubrics

C. Course Content

No	List of Topics	Contact Hours
1.	Fundamentals of measurements	2
2.	Instrument types	2
3.	Static performance characteristics: accuracy, precision, sensitivity, resolution, hysteresis, etc;	2
4.	Measurement Uncertainty: Systematic error	2
5.	Measurement Uncertainty: Random errors	2
6.	Statistical Analysis of Measurements Subject to Random Errors	2
7.	Signal Conditioning: OP-amp, integrator, Differentiator.	2
8.	Signal Conditioning: voltage divider, voltage follower, amplifiers	2
9.	Signal Conditioning: comparator, filters	2
10.	Sensors: displacement, temperature.	2
11.	Sensors: flow, capacitive, light.	2
12.	Sensors: level, Mass, Pressure.	2

13.	Digital to analog and analog to digital converters	2
14.	Digital voltmeter	2
15.	Oscilloscopes	2
	Total	**30**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignments, quizzes and class performance	-	20%
2.	Midterm	8-9	25%
3.	Mini-project	10-17	15%
.4	Final Exam	16th	40%

*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	Measurement and Instrumentation, Alan S Morris and Reza Langari, Academic Press, 2nd edition, 2015.
Supportive References	• Handouts and lecture slides • Reference: Electronic Instrumentation and measurement Techniques, W. D. Cooper and A. D. Helfrick, Prentice Hall, 3rd edition, 1985.
Electronic Materials	Course Page on Blackboard
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Classroom with 25 seats**

Items	Resources
Technology equipment (projector, smart board, software)	**Data show, Blackboard Teaching-Learning Interface**
Other equipment (depending on the nature of the specialty)	**Reprographic facilities**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect through survey
Effectiveness of Students assessment	• Students • Head of the department • Vice dean	Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary
Quality of learning resources	Students	Indirect through survey
The extent to which CLOs have been achieved	Course Instructor	Direct through tests
Other	None	None

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1404/Semester-1/1445 H
DATE	26/10/2023

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification

(Bachelor)

Course Title:	Fundamentals of Design in Electrical Engineering
Course Code:	ELEN1405
Program:	Bachelor of Science in Electrical Engineering
Department:	Department of Electrical Engineering
College:	Faculty of Engineering
Institution:	University of Tabuk
Version:	4
Last Revision Date:	30 October 2023

Table of Contents

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: (7th Level/ 4th Year)					
4. Course general Description:					
This course is an introduction to engineering design, equipping students with fundamental concepts and skills essential for problem-solving and creative design in the engineering field. The course introduces students to the comprehensive engineering design cycle, covering diverse aspects such as literature surveys, problem formulation, customer needs analysis, and design methodologies. Students will have the opportunity to apply their knowledge and skills in hands-on design projects, fostering creativity, problem-solving, effective communication, and teamwork.					
5. Pre-requirements for this course (if any)**:**					
ELEN1312: Electronics Lab, LANT1207: Writing (2)					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
This course aims to cultivate a foundation in engineering design and equip students with the tools needed to tackle real-world engineering challenges.					

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	Demonstrate an understanding of the main principles of the engineering design process.	K2	Lecture-based Learning. Project-Based Learning	Exams/ projects
2.0	**Skills**			
2.1	Formulate clear problem definitions, design goals, and design objectives for an engineering design	**S1**	Lectures and Project-Based Learning	Assignments / Exams/ Projects
2.2	Generate and evaluate conceptual design ideas	**S1**	Lectures and Project-Based Learning	Assignments / Quizzes / Exams
2.3	Apply mathematical methods for the comprehensive analysis of engineering designs.	**S1**	Project-based Learning	Assignments / Exams/ Projects
2.4	Design a system or process to meet	**S2**	Lectures and Project-Based Learning	Projects

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	specifications with engineering constraints			
2.5	Identify and evaluate realistic constraints that are applicable on the engineering system design.	**S6**	Project-Based Learning	Projects
2.6	Develop and refine oral and written communication skills	**S4**	Lectures and Project-based learning	Projects
3.0	**Values, autonomy, and responsibility**			
3.1	Function as a member of an engineering team.	**V2**	Project-Based Learning	Projects
3.2	Demonstrate an understanding of ethical and professional issues as well as engineering standards.	**V1**	Lecture and Project-Based Learning	Assignments/ Exams/Projects

C. Course Content

No	List of Topics	Contact Hours
1.	Engineering design process and formulation of design problems	3
2.	Problem identification and customer needs analysis	3
3.	Requirement setting and engineering design specifications	3
4.	Teams and teamwork, meeting management, professionalism	3
5.	Oral Presentations,	3
6.	technical writing: reports, proposals, lab report	3
7.	Project management, planning, Gantt charts, schedules	3
8.	Concept generation and evaluation,	3
9.	brainstorming, SCAMPER and pugh matrix	3
10.	System design: Functional decomposition and applications.	3
11.	System design: Functional decomposition (cont. applications, and coupling and cohesion)	3
12.	System design: Behavior models (Models, state diagram, flowchart)	3

13.	System design: Behavior models (Data flow diagram, entity relationship, unified modeling language)	3
14.	Ethical and Legal Issues, academic honesty, code of ethics	3
15.	Testing principles	3
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignments and Quizzes	3,6,9,13	20%
2.	Project	4,8,15	50%
.3	Midterm Exam	9	10%
.4	Final Exam	17	20%

*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. Ford, C. Coulston, Design for Electrical and Computer Engineers, McGraw Hill, 2008
Supportive References	• Clive L. Dym, Patrick Little, Engineering Design: A Project-Based Introduction, 3rd Ed., John Wiley, 2008 • Kosky P. et al., " Exploring Engineering: An introduction for Freshmen to Engineering and to the Design Process", Elsevier Inc. 2006.
Electronic Materials	Course Page on Blackboard
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Classroom with 10 seats**
Technology equipment (projector, smart board, software)	**Data show, Blackboard Teaching-Learning Interface**

Items	Resources
Other equipment (depending on the nature of the specialty)	**Reprographic facilities**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect through survey
Effectiveness of Students assessment	• Students • Head of the department • Vice dean	Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary
Quality of learning resources	Students	Indirect through survey
The extent to which CLOs have been achieved	Course Instructor	Direct through tests
Other	None	None

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1405/Semester-1/1445 H
DATE	30/10/2023

2023
TP-153

Course Specification

(Bachelor)

Course Title: Practical Engineering Essentials
Course Code: ELEN1406
Program: Bachelor of Science in Electrical Engineering
Department: Department of Electrical Engineering
College: Faculty of Engineering
Institution: University of Tabuk
Version: 1
Last Revision Date: 28 October 2023

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (1)					
2. Course type					
A.	☐University	☒ College	☐Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (10th Level / 5th Year)					
4. Course general Description:					
This course introduces students to: Technical reports in engineering (research, feasibility, design, progress), Technical drawings in engineering and computer-aided design (CAD), Professional presentation (technical content, visual aids, delivery, time constraint), Measurement and instrumentation in engineering, Gathering and analyzing accurate data, Evaluate the constraints of sustainability, economy, environment, politics, health and safety, society in engineering solutions, Benefits of teamwork and community service.					
5. Pre-requirements for this course (if any)**:**					
None					
6. Pre-requirements for this course (if any)**:**					
None					
7. Course Main Objective(s):					
This course introduces students to: technical reports and drawings in engineering, professional presentation, gathering and analyzing accurate data, and evaluating the several constraints. Encourage students to participate in community service through their mini-projects by solving engineering problems and spread engineering-related awareness.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	15	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**	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 CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Demonstrate knowledge of Measurement, instrumentation, and simulation in engineering	K1	Lecture Based Learning	Direct via Exam
2.0	**Skills**			
2.1	Apply communications skills to effectively present/write on specific topic	S4	Problem Based Learning	Direct Mini-project

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.2	Identify and evaluate the issues and constraints of sustainability, economy, environment, politics, health and safety, and society in an engineering topic/project	S6	Problem Based Learning	Direct Mini-project
3.0	**Values, autonomy, and responsibility**			
3.1	Participate in a team providing community service via training, presentation, ...etc.	V2	Problem Based Learning	Direct Mini-project

C. Course Content

No	List of Topics	Contact Hours
1	Technical reports in engineering (research, feasibility)	1
2	Technical reports in engineering (design, progress)	1
3	Technical drawings in engineering	1
4	Computer-aided design (CAD)	1
5	Professional presentation (technical content, visual aids)	1
6	Professional presentation (delivery, time constraint)	1
7	Measurement, instrumentation, and simulation in engineering	1
8	Gathering and analyzing accurate data	1
9	Evaluate the constraints of sustainability in engineering solutions	1
10	Evaluate the constraints of economy in engineering solutions	1
11	Evaluate the constraints of environment in engineering solutions	1
12	Evaluate the constraints of politics in engineering solutions	1
13	Evaluate the constraints of health and safety in engineering solutions	1
14	Evaluate the constraints of society in engineering solutions	1
15	Benefits of teamwork and community service	1
Total		**15**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Class attendance and participation	All	20%
2.	presentation	3,6,8	20%
.3	Mini-Project	8,10,14	60%
…			

*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	J. Abarca, et al, " Engineering Design: A project-Based Approach", University of Colorado boulder
Supportive References	Handouts
Electronic Materials	Course Blackboard Page
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom and laboratory for 20 students
Technology equipment (projector, smart board, software)	Interactive course
Other equipment (depending on the nature of the specialty)	Computer

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect through survey
Effectiveness of Students assessment	• Students • Head of the department • Vice dean	Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and

Assessment Areas/Issues	Assessor	Assessment Methods
		provide feedback when necessary
Quality of learning resources	Students	Indirect via survey
The extent to which CLOs have been achieved	Peer Reviewer	Direct via Exams
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Faculty of Engineering Council
REFERENCE NO.	ELEN1406/Semester-1/1445 H
DATE	23/10/2023

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification

(Bachelor)

Course Title: Control Lab	
Course Code: ELEN1407	
Program: Bachelor of Science in Electrical Engineering	
Department: Department of Electrical Engineering	
College: Faculty of Engineering	
Institution: University of Tabuk	
Version: 4	
Last Revision Date: 26 October 2023	

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (1)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (8th Level/ 4th Year)					
4. Course general Description:					
Practical implementation of modeling and various PID control combinations, impact of closed-loop control on system performance, applications include process, HVAC, and DC motor systems.					
5. Pre-requirements for this course (if any)**:**					
ELEN1305: Electrical Circuits Lab ELEN1403: Control Systems					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
To provide students with hand-on experience in modeling and implementing of various combinations of PID controller for DC motor and HVAC					

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 CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Demonstrate the knowledge about modeling, closed loop control systems and performance of various PID controller.	**K3**	Lectures	Quizzes
2.0	**Skills**			
2.1	Conduct experiments to extract the parameters of process.	**S3**	Experimental-based learning	Laboratory Reports / Quizzes
2.2	Conduct experiments related to closed loop control systems	**S3**	Experimental-based learning	Laboratory Reports / Quizzes
2.3	Conduct experiments related to PID controller.	**S3**	Experimental-based learning	Laboratory Reports / Quizzes
2.4	Record, analyze and interpret experimental data.	**S3**	Experimental-based learning	Laboratory Reports / Quizzes
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate effective teamwork skills by collaboratively engaging with peers during laboratory	V2	Experimental-based learning	Rubrics

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	experiments to achieve successful outcomes.			

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction and lab safety	2
2.	Refreshment about Control System and its importance in practice	2
3.	Revision of modeling and its importance in control systems	2
4.	Step response characteristics of first order systems	2
5.	Step response characteristics of second order systems	2
6.	Revision of MATLAB commands in control issues	2
7.	Using MATLAB to simulate PID controller	2
8.	DC Bump test Modeling for DC motor	2
9.	Model Validation for DC motor	2
10.	Proportional speed control for DC motor	2
11.	Qualitative PI speed Control for DC motor	2
12.	Qualitative PD Position Control for DC motor	2
13.	HVAC ON-Off Control	2
14.	HVAC Qualitative PI Control	2

15.	HVAC Saturation and Windup	2
Total		**30**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes (prelab exams)	Every week	20%
2.	Reports	Every week	70%
.3	Lab activity	Every week	10%
.4			

*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	• Modern Control Engineering, Katsuhiko Ogata, Pearson, 5th edition, 2009. • Modern Control Systems, Richard C. Dorf and Robert Bishop, Pearson, 11th edition, 2008.
Supportive References	• Lab manual
Electronic Materials	Course Page on Blackboard
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**laboratories with 12 seats**
Technology equipment (projector, smart board, software)	**Data show, Blackboard Teaching-Learning Interface**
Other equipment (depending on the nature of the specialty)	**NI ELVIS II+ workstation- QNET DC motor control trainer module- QNET HVAC trainer module**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect through survey
Effectiveness of Students assessment	• Students • Head of the department • Vice dean	Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary
Quality of learning resources	Students	Indirect through survey
The extent to which CLOs have been achieved	Course Instructor	Direct through tests
Other	None	None

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1406/Semester-1/1445 H
DATE	26/10/2023

2023

TP-153

Course Specification

(Bachelor)

Course Title:	Communications Engineering
Course Code:	ELEN1408
Program:	Bachelor of Science in Electrical Engineering
Department:	Department of Electrical Engineering
College:	Faculty of Engineering
Institution:	University of Tabuk
Version:	4
Last Revision Date:	30 October 2023

Table of Contents

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: (8th Level/ 4th Year)					
4. Course general Description:					
Amplitude modulations: Time and frequency domain analysis of AM, DSB-SC, SSB, QAM, and VSB modulation techniques, Superheterodyne Receiver; Angle Modulation: Frequency Modulation, Phase Modulation; Direct and Indirect Generation of FM signal, Spectrum of Single Tone FM Signal, NBFM, WBFM, Carson's rule; Pulse Modulation: PAM, PWM, PPM, Sampling Theorem, PCM, DPCM, DM; Multiplexing techniques: FDM, TDM; Signal-to-noise ratio.					
5. Pre-requirements for this course (if any):					
ELEN1401: Probabilistic Methods in Electrical Engineering					
6. Co-requisites for this course (if any):					
None					
7. Course Main Objective(s):					
The main objectives of this course are to provide a comprehensive understanding of various modulation techniques, including AM, FM, and pulse modulation, as well as multiplexing methods in both time and frequency domain.					

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**	39
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	0
5.	**Problem solving sessions**	6
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	Demonstrate the knowledge of amplitude, frequency, and pulse modulation systems.	**K2**	Lectures Based Learning	Quizzes/ Midterm Exam
1.2	Compare different AM, FM, Pulse modulation as well as multiplexing techniques in terms of power, bandwidth, and complexity.	**K2**	Lectures Based Learning	Quizzes/ Midterm Exam
2.0	**Skills**			
2.1	Analyze amplitude modulation techniques including AM, DSV-SC, SSB, VSB, and QAM in both time and frequency domains.	**S1**	Lectures and Problem-based learning	Quizzes/ Midterm Exam
2.2	Analyze angle modulation techniques, including both narrowband and wideband FM and PM, in both the time and frequency domains.	**S1**	Lectures and Problem-based learning	Quizzes/ Midterm Exam

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.3	Analyze pulse modulation techniques including PCM, DPCM, and Delta modulation.	**S1**	Lectures and Problem-based learning	Quizzes/ Final Exam
2.4	Apply the concept of the Nyquist-Shannon sampling theorem.	**S1**	Lectures and Problem-based learning	Quizzes/ Final Exam
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate a commitment to academic integrity and values by consistently engaging in ethical conduct throughout assessments.	V1	Lectures	Calculate the percentage of instances reflecting exemplary ethical behavior during assessments.

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction and Components of Communication Systems	3
2.	Review of Signals and Systems	3
3.	Double Side Band Suppressed Carrier	3
4.	Amplitude Modulation	3
5.	Single Side Band and Vestigial Side Band	3
6.	Quadrature Amplitude Modulation	3
7.	Frequency Division Multiplexing and Super-heterodyne Receiver	3
8.	Basics of Angle Modulation	3
9.	Spectrum of Narrowband and Wideband FM Signals	3
10.	Direct and Indirect Generation of FM Signal	3
11.	FM Demodulation	3
12.	Sampling Theorem, Quantization, Encoding	3
13.	Pulse Code Modulation and DPCM	3
14.	Delta Modulation and Line Codes	3
15.	Signal-to-noise ratio.	3
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	3,6,9,13,14	20%
2.	Midterm Exam 1	5-7	20%
3.	Midterm Exam 2	10-12	20%
4.	Final Exam	17-19	40%

*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	An Introduction to Analog and Digital Communications, Simon Haykin, Michael Moher, Wiley, 2nd edition, 2006.
Supportive References	• Lecture Handouts • Modern Digital and Analog Communication Systems, B.P. Lathi and Zhi, Oxford University Press; 5th edition, 2018
Electronic Materials	Course Page on Blackboard
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Classroom with 25 seats**
Technology equipment (projector, smart board, software)	**Data show, Blackboard Teaching-Learning Interface**
Other equipment (depending on the nature of the specialty)	**Reprographic facilities**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect through survey

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of Students assessment	• Students • Head of the department • Vice dean	Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary
Quality of learning resources	Students	Indirect through survey
The extent to which CLOs have been achieved	Course Instructor	Direct through tests
Other	None	None

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1407/Semester-1/1445 H
DATE	30/10/2023

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification

(Bachelor)

Course Title:	Electrical Machines Lab
Course Code:	ELEN1409
Program:	Bachelor of Science in Electrical Engineering
Department:	Department of Electrical Engineering
College:	Faculty of Engineering
Institution:	University of Tabuk
Version:	4
Last Revision Date:	29 October 2023

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (1)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required			☐ Elective	
3. Level/year at which this course is offered: (8th Level/ 4th Year)					
4. Course general Description:					
The aim of this course is to introduce the students to three-phase circuits and power measurements, single phase transformer, three-phase transformers, DC machine, parameters of three-phase synchronous generator, three-phase induction motor.					
5. Pre-requirements for this course (if any):					
ELEN1402: Electric Machines, ELEN1305: Electrical Circuits Lab					
6. Co-requisites for this course (if any):					
None					
7. Course Main Objective(s):					
To provide students with hand-on experience in designing and implementing electrical machines and transformers.					

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 CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Demonstrate the knowledge about three phase circuits , induction machines, transformers, and synchronous machines.	K3	Experiment-Based Learning	Assignments / Final Exam
1.2				
2.0	**Skills**			
2.1	Conduct experiments related to three-phase circuits and power measurements.	S3	Experiment-Based Learning	Assignments / Final Exam
2.2	Conduct experiments related to transformers.	S3	Experiment-Based Learning	Assignments / Final Exam
2.3	Conduct experiments related to induction machine.	S3	Experiment-Based Learning	Assignments / Final Exam
2.4	Conduct experiments related to synchronous machines.	S3	Experiment-Based Learning	Assignments / Final Exam
2.5	Record, analyze and interpret experimental data.	S3	Experiment-Based Learning	Assignments / Final Exam
2.6				
3.0	**Values, autonomy, and responsibility**			

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
3.1	Demonstrate effective teamwork skills by collaboratively engaging with peers during laboratory experiments to achieve successful outcomes.	V2	Experimental-based learning	Rubrics

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction and Lab Safety.	2
2.	Magnetic Powder Brake & electronic control.	2
3.	Three-phase circuits.	2
4.	Power measurements.	2
5.	Equivalent circuit of Single phase transformers.	2
6.	Performance of Single phase transformers.	2
7.	Equivalent circuit of Three-phase transformers.	2
8.	Performance of Three-phase transformers.	2
9.	DC Generator Characteristics	2
10..	Equivalent circuit parameters of three-phase induction motor.	2
11.	Performance of three-phase induction motor.	2
12.9	Torque- Speed Characteristics of three-phase induction motor.	2

13.1	Parameters of the synchronous Generator.	2
14.1	Equivalent circuit parameters of synchronous motor.	2
15.1	Parameters of the synchronous motor.	2
Total		**30**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	------	-----
2.	Assignments	Every week	60%
3.	Lab activity	Every week	20%
4.	Final Exam	16	20%

*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	Paresh C. Sen, "Principles of Electric Machines and Power Electronics", Wiley John Wiley & Sons, Third Edition, 2014.
Supportive References	• Lab manual • Stephen J. Chapman, "Electric Machinery Fundamentals", McGraw-Hill, Fifth Edition, 2012.
Electronic Materials	Course Page on Blackboard
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Electric Machines Lab with 20 seats**
Technology equipment (projector, smart board, software)	**Data show, Blackboard Teaching-Learning Interface**
Other equipment (depending on the nature of the specialty)	**Computers, Experiments kits**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	**Students**	**Indirect through survey**
Effectiveness of Students assessment	• **Students** • **Head of the department** • **Vice dean**	**Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary**
Quality of learning resources	**Students**	**Indirect through survey**
The extent to which CLOs have been achieved	**Course Instructor**	**Direct through tests**
Other	**None**	**None**

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1408/Semester-1/1445 H
DATE	30/10/2023

2023
TP-153

Course Specification

(Bachelor)

Course Title: Embedded Systems	
Course Code: ELEN1410	
Program: Bachelor of Science in Electrical Engineering	
Department: Department of Electrical Engineering	
College: Faculty of Engineering	
Institution: University of Tabuk	
Version: 4	
Last Revision Date: 14 October 2023	

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (4)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (8th Level/ 4th Year)					
4. Course general Description:					
In this course the student will learn the high-level programming model of microcontrollers based on digital systems. Students will study and analyze the basic concepts related to integration of programs developed as a mixture of high-level languages (C language) and low-level (assembly) to extract the Hex file (in machine language). This is complemented with the study, analysis and design of the buses and input/output microcontroller interfaces. The PIC 16F8xx microcontroller family will be used to get the particularization of all the theoretical concepts. Practically, the necessary steps, experiments and methods are used to interface a microcontroller system to external devices.					
5. Pre-requirements for this course (if any)**:**					
ELEN1404 Instrumentation and Measurements, CSC1103: introduction to programming					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
• To have the knowledge of the structure, organization, operation and interconnection of 8 bit microcontroller architecture. • To design digital systems, including implementing different system interfacing, microcontroller - based systems and communications systems such as motors, LCD, sensors, etc. • To be able to use and program microcontrollers					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	75	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**	30
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 CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Explain the basics of microcontroller-based embedded systems such as structure and processes	K2	Lectures	Midterm Exam
2.0	**Skills**			
2.1	Employ the microcontroller interfacing methods with parallel I/O devices.	S2	Lectures and Problem-based learning Project-Based Learning	Quizzes/ min project/ Midterm Exam/ Final Exam
2.2	Write programs using "C" programming language to interface microcontroller with analog and digital sensors.	S5	Lectures and Problem-based learning Project-Based Learning	Quizzes/ min project/ Midterm Exam/ Final Exam

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.3	Apply the advanced concepts related to microcontrollers interrupts to design advanced systems.	S2	Lectures and Problem-based learning	Final Exam
2.4	Design PIC-based embedded systems, including parallel/serial and analog/digital peripherals.	S6	Lectures and Problem-based learning Project-Based Learning	Quizzes/ min project/Midterm Exam/ Final Exam
2.5	Construct embedded systems using implementing, programming, troubleshooting, debugging, testing tools.	S3	Lectures, Experiment-Based Learning	Midterm Exam/ Final Exam
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate effective teamwork skills by collaborating with peers in the successful completion of projects.	V2	Project-based learning	Rubrics

C. Course Content

No	List of Topics	Contact Hours
1.	Evolution of Microcontroller/microprocessor and types. Numbers, Logic Circuit.	5
2.	CPU, I/O, devices, clock, memory, bussed architecture, address bus, data bus and control bus.	5
3.	Development of semiconductor memory, internal structure and decoding, memory read and write timing diagrams, MROM, ROM, EPROM, EEPROM, DRAM.	5
4.	Silent features, architecture, pin diagram, register organization, limitations of PIC 16f8xx Microcontroller.	5
5.	Details of memory segmentation, spatial function registers (SFR) and memory address generation for PIC 16f887 microcontroller.	5
6.	Concept of Machine Language, Instruction format, addressing modes.	5

7.	Instruction set (Arithmetic, logical, data transfer, bit manipulation, string, program control transfer, process control).	5
8.	Describe the conventions, functions parameters process, results return and so on.	5
9.	Design and write programs combining assembly language (low-level) and C language (high-level).	5
10.	Use the editor development and debugging environment to write programs combining assembly and C languages.	5
11.	Parallel I/O, Programmed I/O, I/O port address decoding, Pulling;	5
12.	Interfacing of I/O devices, LEDs, motors, LCD and toggle-switches.	5
13.	Internal structure of the Analog, CCP Capture/Compare/PWM, clock oscillators and timers.	5
14.	Interfacing between microcontroller and analog sensors.	5
15.	Micro-Controller interrupts. Serial port communication.	5
Total		**75**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	9,13	20%
2.	Midterm Exam	7	20%
3.	Mini project	10	10%
4.	Lab (including reports and lab final)	7-16	20%
5.	Final Exam	16	30%

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

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	PIC Microcontroller - Programming in C, by Milan Verle, MikroElektronika, 2009. ISBN-13: 9788684417178.
Supportive References	• Lecture Handouts • Embedded System Design: A Unified Hardware/Software Introduction, Frank Vahid and Toni Givargis, Wiley, 6th

	• PIC Microcontroller Projects in C: Basic to Advanced, Dogan Ibrahim, Newnes, 7th ,2014, ISBN: 0080999247
Electronic Materials	Course Page on Blackboard
Other Learning Materials	NA

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom with 25 seats Embedded Lab with 12 seats
Technology equipment (projector, smart board, software)	Data show, Blackboard Teaching-Learning Interface
Other equipment (depending on the nature of the specialty)	Computer, 8-bit microcontroller kits.

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	**Students**	**Indirect through survey**
Effectiveness of Students assessment	• **Students** • **Head of the department** • **Vice dean**	**Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary**
Quality of learning resources	**Students**	**Indirect through survey**
The extent to which CLOs have been achieved	**Course Instructor**	**Direct through tests**
Other	**None**	**None**

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1410/Semester-1/1445 H
DATE	14/10/2023

2023
TP-153

Course Specification
(Bachelor)

Course Title: Electrical Energy Engineering
Course Code: ELEN1411
Program: Bachelor of Science in Electrical Engineering
Department: Department of Electrical Engineering
College: Faculty of Engineering
Institution: University of Tabuk
Version: 4
Last Revision Date: 14 October 2023

Table of Contents

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: (8th Level/4th Year)					
4. Course general Description:					
Power system components: generation, transmission, and distribution; Energy sources: fossil, nuclear, and renewable; Energy conversion; Three-phase analysis of balanced systems; Power factor correction; Per-unit Analysis; Transformers; Overhead transmission line parameters: resistance, inductance, and capacitance calculations; Overhead transmission line equivalent circuits; Voltage regulation and efficiency of transmission line.					
5. Pre-requirements for this course (if any)**:**					
ELEN1402: Electrical Machines					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
To understand the components and fundamental concepts of electrical power systems and the basics of their analysis.					

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**	39
.2	**Laboratory/Studio**	0
.3	**Field**	0
.4	**Tutorial**	0
.5	**Problem solving sessions**	6
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	Demonstrate knowledge of concepts of power system components, sources of energy, and single line diagram.	K3	Lectures	Quizzes, Exams
2.0	**Skills**			
2.1	Conduct three-phase analysis of balanced systems.	S1	Lectures and Problem-based learning	Quizzes, Exams
2.2	Implement three-phase power factor correction techniques	S1	Lectures and Problem-based learning	Quizzes, Exams
2.3	Analyze three-phase systems using per-unit analysis.	S1	Lectures and Problem-based learning	Quizzes, Exams
2.4	Derive the equivalent circuit for both transmission lines and transformers.	S1	Lectures and Problem-based learning	Quizzes, Exams

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.5	Determine transmission line parameters including impedance and capacitance.	S1	Lectures and Problem-based learning	Quizzes, Exams
2.6	Analyze voltage regulation, efficiency, and characteristics lossless transmission lines.	S1	Lectures and Problem-based learning	Quizzes, Exams
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate a commitment to academic integrity and values by consistently engaging in ethical conduct throughout assessments.	V1	Lectures	Calculate the percentage of instances reflecting exemplary ethical behavior during assessments.

C. Course Content

No	List of Topics	Contact Hours
1.	Concepts of power system components, sources of energy, and single line diagram	3
2.	Balanced three-phase systems	3
3.	Power system analysis: voltage drop and regulation	3
4.	Power factor correction	3
5.	Three-phase transformer connections, phase shift, and equivalent circuit.	3
6.	The per-unit system	3
7.	Per-unit equivalent circuits of balanced three-phase	3
8.	Concepts of transmission lines	3
9.	Equivalent circuit for transmission lines: Short and Medium length	3
10.	Equivalent circuit for transmission lines: Long Length	3
11.	Voltage regulation and Profiles, efficiency, and lossless transmission lines	3

12.	Inductance: single-phase two-wire line	3
13.	Inductance: three-phase three-wire line	3
14.	Inductance: composite conductors, unequal phase spacing, bundled conductors.	3
15.	Capacitance: single-phase two-wire line and three-Phase	3
	Total	**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	6, 10, 14	20%
2.	Midterm Exam 1	7-8	20%
.3	Midterm Exam 2	11-12	20%
.4	Final Exam	18	40%

*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	Hadi Saadat, "Power System Analysis", McGraw-Hill Series, Third Edition, 2010.
Supportive References	• Lecture slides • John J. Grainger and William D. Stevenson, "Power System Analysis", McGraw-Hill Series, 1994.
Electronic Materials	Course Page on Blackboard
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom

Items	Resources
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	Students	Indirect through survey
Effectiveness of Students' assessment	• Students • Head of the department • Vice dean	Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary.
Quality of learning resources	Students	Indirect through survey
The extent to which CLOs have been achieved	Course Instructor	Direct from exam results
Other	None	None

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1411/Semester-1/1445 H
DATE	14/10/2023

Course Specification

(Bachelor)

Course Title:	Power Electronics
Course Code:	ELEN1412
Program:	Bachelor of Science in Electrical Engineering
Department:	Department of Electrical Engineering
College:	Faculty of Engineering
Institution:	University of Tabuk
Version:	4
Last Revision Date:	11 October 2023

Table of Contents

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: (9th Level/ 5th Year)					
4. Course General Description:					
Understanding of power electronics and devices concepts; performing power computations; analyzing rectifiers, including controlled and uncontrolled single- and three-phase rectifiers, as well as voltage controllers; analyzing non-isolated and isolated DC-to-DC converters; designing different types of DC-DC converters, such as buck, boost, buck-boost converters; analyze DC-AC inverters and explore pulse-width modulation techniques for their control.					
5. Pre-requirements for this course (if any)**:**					
ELEN1308: Electronics II					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
The main objective of the course is to provide students with a comprehensive understanding of power electronics and devices, enabling them to perform power computations, analyze and design various power electronics topologies.					

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**	39
.2	**Laboratory/Studio**	0
.3	**Field**	0
.4	**Tutorial**	0
.5	**Problem solving sessions**	6
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	Demonstrate knowledge of concepts of power electronics and devices.	K3	Lecture	Quizzes/ Assignments/ Midterm Exam/Final Exam
2.0	**Skills**			
2.1	Perform power computations.	S1	Lectures, Problem-based learning	Quizzes/ Assignments/ Midterm Exam/Final Exam
2.2	Analyze rectifiers controlled and uncontrolled single- and three-phase and voltage controllers.	S1	Lectures, Problem-based learning	Quizzes/ Assignments/ Midterm Exam/Final Exam
2.3	Analyze non-isolated and isolated DC-to-DC converters.	S1	Lectures, Problem-based learning	Quizzes/ Assignments/ /Final Exam
3.4	Design various DC-DC converters.	S2	Lectures, Problem-based learning	Quizzes/ Assignments/ Midterm Exam/Final Exam
2.5	Analyze DC-AC inverter and use pulse-width modulation techniques.	S1	Lectures, Problem-based learning	Quizzes/ Assignments/ Midterm Exam/Final Exam
2.6	Implement a power electronics system using computer	S5	Project-based learning	Deliverables/ outcomes of the project

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	software to model, simulate, and/or analyze.			
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate effective teamwork skills by collaborating with peers in the successful completion of projects.	V2	Project-based learning	Rubrics

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to power electronics	3
2.	Power Computations.	3
3.	Power semiconductor devices	3
4.	Half-Wave Rectifiers: Controlled rectifiers	3
5.	Half-Wave rectifiers: Uncontrolled Rectifiers	3
6.	Full-Wave Rectifiers: Controlled Rectifiers	3
7.	Full-Wave Rectifiers: Uncontrolled Rectifiers	3
8.	Three-phase rectifiers	3
9.	AC Voltage Controllers.	3
10.	DC-DC Converters: Boost Converter	3
11.	DC-DC Converters: Buck Converter	3
12.	DC-DC Converters: Buck-Boost Converter	3
13.	DC Power Supplies.	3
14.	Inverters: half-bridge inverter	3
15.	Inverters: full-bridge inverter	3
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignments and Quizzes	-	20%
2.	Midterm Exam	8-10	25%
.3	Mini-Project	10-17	15%
.4	Final Exam	17-19	40%

*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	Power Electronics, Daniel W Hart, 1st edition, 2010.
Supportive References	• Handouts and lecture slides
Electronic Materials	Course Page on Blackboard
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Classroom with 25 seats**
Technology equipment (projector, smart board, software)	**Data show, Blackboard Teaching-Learning Interface**
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**	**Indirect through survey**
Effectiveness of Students assessment	**• Students • Head of the department • Vice dean**	**Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary**
Quality of learning resources	**Students**	**Indirect through survey**

Assessment Areas/Issues	Assessor	Assessment Methods
The extent to which CLOs have been achieved	Course Instructor	Direct through Exams
Other	None	None

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1412/Semester-1/1445 H
DATE	11/10/2023

2023
TP-153

Course Specification
(Bachelor)

Course Title:	Communications Lab
Course Code:	ELEN1413
Program:	Bachelor of Science in Electrical Engineering
Department:	Department of Electrical Engineering
College:	Faculty of Engineering
Institution:	University of Tabuk
Version:	4
Last Revision Date:	14 October 2023

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (1)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (9th Level/ 5th Year)					
4. Course general Description:					
This laboratory introduces the students to the practical implementation of communications transceivers for various techniques like DSB, SSB, AM and FM and introduce sampling and multiplexing techniques					
5. Pre-requirements for this course (if any):					
ELEN1305: Electrical Circuits Laboratory, ELEN1408: Communications Engineering					
6. Co-requisites for this course (if any):					
7. Course Main Objective(s):					
To provide students with hand-on experience in designing and implementing communications transceivers for various techniques.					

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 CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Demonstrate a comprehensive understanding of safety protocols specific to electrical engineering laboratories.	K2	Lectures	Exams
2.0	**Skills**			
2.1	Record, analyze and interpret experimental data.	**S3**	Experiment-Based Learning	Exams and Reports
2.2	Conduct experiments about the transmitter and receiver of DSB ,SSB, and AM signals as a modulation technique	**S3**	Experiment-Based Learning	Exams and Reports
2.3	Conduct experiments about FM Transceiver	**S3**	Experiment-Based Learning	Exams and Reports
2.4	Conduct experiments about PCM Encoder-Decoder	**S3**	Experiment-Based Learning	Exams and Reports
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate effective teamwork skills by collaboratively	V2	Experimental-based learning	Rubrics

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	engaging with peers during laboratory experiments to achieve successful outcomes.			

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction and Lab Safety.	2
2.	An introduction to the NI ELVIS II test.	2
3.	DATEx experimental add-in module and soft front panel control.	2
4.	Amplitude modulation (AM).	2
5.	AM demodulation.	2
6.	Double Sideband (DSBSC) modulation.	2
7.	DSBSC demodulation	2
8.	Observations of AM signals in the frequency domain.	2
9.	Observations of DSBSC signals in the frequency domain.	2
10.	Single Sideband (SSB) modulation.	2
11.	SSB demodulation.	2
12.	Frequency Modulation (FM).	2
13.	FM demodulation.	2
14.	Sampling & reconstruction.	2
15.	PCM encoding and decoding.	2
	Total	**30**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Reports	Every week	30%
2.	Midterm	8	30%
3.	Final Exam	16	40%

*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	An Introduction to Analog and Digital Communications, Simon Haykin, Michael Moher, Wiley, 2nd edition, 2006.

Supportive References	Emona DATEx Lab assignments manual.
Electronic Materials	Course Page on Blackboard
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Communications laboratory**
Technology equipment (projector, smart board, software)	**Emona DATEx Elvis II with Labview software.**
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**	**Indirect through survey**
Effectiveness of Students assessment	• **Students** • **Head of the department** • **Vice dean**	**Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary**
Quality of learning resources	**Students**	**Indirect through survey**
The extent to which CLOs have been achieved	**Course Instructor**	**Direct through tests**
Other	**None**	**None**

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1413/Semester-1/1445 H
DATE	14/10/2023

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
(Bachelor)

Course Title:	Electrical Energy Lab
Course Code:	ELEN1414
Program:	Bachelor of Science in Electrical Engineering
Department:	Department of Electrical Engineering
College:	Faculty of Engineering
Institution:	University of Tabuk
Version:	4
Last Revision Date:	29 October 2023

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (1)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (9th Level/ 5th Year)					
4. Course general Description:					
The aim of this course is to introduce the students to three-phase power factor correction, three-phase transformers with different connections, performance of transmission lines (short, medium, and long) under different load conditions, synchronous generators and synchronization circuits, and bus systems.					
5. Pre-requirements for this course (if any)**:**					
ELEN1410: Electrical Energy Engineering					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
To provide students with hand-on experience in testing and implementation of power and energy measurements.					

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 CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Demonstrate the knowledge of power factor correction, three-phase transformers, transmission lines, synchronization circuits, and bus systems.	K3	Experiment-Based Learning	Assignments / Final Exam
1.2				
2.0	**Skills**			
2.1	Conduct experiments to examine power factor correction.	S3	Experiment-Based Learning	Assignments / Final Exam
2.2	Conduct experiments related to three-phase transformers.	S3	Experiment-Based Learning	Assignments / Final Exam
2.3	Conduct experiments related to transmission lines (short, medium, long).	S3	Experiment-Based Learning	Assignments / Final Exam
2.4	Conduct experiments related to synchronous generators and synchronization circuits.	S3	Experiment-Based Learning	Assignments / Final Exam

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.5	Conduct experiments related to double busbar systems.	S3	Experiment-Based Learning	Assignments / Final Exam
2.6	Record, analyze and interpret experimental data.	S3	Experiment-Based Learning	Assignments / Final Exam
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate effective teamwork skills by collaboratively engaging with peers during laboratory experiments to achieve successful outcomes.	V2	Experimental-based learning	Rubrics

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction and Lab safety	2
2.	Power Factor Correction	2
3.	Three-phase Transformers: Δ-Δ, Y-Y connections	2
4.	Three-phase Transformers: Δ-Y, Y-Δ connections	2
5.	Synchronization Circuits	2
6.	Synchronous Generator	2
7.	Performance Characteristics of Synchronous Machines in Isolated Operation	2
8.	Performance of Transmission Lines Under no load and R Load	2
9.	Performance of Transmission Lines Under L Load	2
10.	Performance of Transmission Lines Under C Load	2

11.	Performance of Transmission Lines Under Mixed Loads	2
12.	Series Operation of Transmission Lines	2
13.	Parallel Operation of Transmission Lines	2
14.	Double Busbar System basics	2
15.	Double Busbar System with Load.	2
Total		**30**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	------	-----
2.	Assignments	Every week	60%
3.	Lab activity	Every week	20%
4.	Final Exam	16	20%

*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	• Paresh C. Sen, “Principles of Electric Machines and Power Electronics”, Wiley John Wiley & Sons, Third Edition, 2014. • John J. Grainger and William D. Stevenson, “Power System Analysis”, McGraw-Hill Series, 1994.
Supportive References	Lab manual
Electronic Materials	Course Page on Blackboard
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Electric Machines and energy Lab with 20 seats**
Technology equipment (projector, smart board, software)	**Data show, Blackboard Teaching-Learning Interface**
Other equipment (depending on the nature of the specialty)	**Computers, Experiments kits**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	**Students**	**Indirect through survey**
Effectiveness of Students assessment	• **Students** • **Head of the department** • **Vice dean**	**Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary**
Quality of learning resources	**Students**	**Indirect through survey**
The extent to which CLOs have been achieved	**Course Instructor**	**Direct through tests**
Other	**None**	**None**

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1414/Semester-1/1445 H
DATE	29/10/2023

2023
TP-153

Course Specification

(Bachelor)

Course Title:	Digital Signal Processing
Course Code:	ELEN1414
Program:	Bachelor of Science in Electrical Engineering
Department:	Department of Electrical Engineering
College:	Faculty of Engineering
Institution:	University of Tabuk
Version:	4
Last Revision Date:	30 October 2023

Table of Contents

A. General information about the course:

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: (9^{th} Level/ 5^{th} Year)					

4. Course general Description:

Discrete time Fourier Transform: Definition, Properties, periodicity, spectral analysis, inverse DTFT, Frequency Response; Discrete Fourier Transform; Introduction to Fast Fourier Transform Algorithms (FFT); Z Transform and Inverse Z Transform; Finite impulse response (FIR); Infinite impulse response (IIR) ; Structure for Discrete-Time Systems: Direct, Cascade, and Parallel forms; Filter design techniques, Design of Discrete Time FIR and IIR Filter.

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

ELEN1403: Control Systems

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

None

7. Course Main Objective(s):

To equip students with the skills required to analyze and manipulate discrete-time signals, design IIR and FIR filters, and comprehend the underlying principles of spectral analysis and frequency response evaluation in discrete-time systems.

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%

No	Activity	Contact Hours
1.	**Lectures**	39
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	0
5.	**Problem solving sessions**	6
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	Demonstrate a comprehensive Knowledge and understanding of signal processing concepts.	K2	Lectures	Exams
2.0	**Skills**			
2.1	Apply DTFT and its properties for spectral analysis of discrete-time signals.	S1	Lectures and Problem-based learning	Quizzes/ Midterm Exam
2.2	Analyze frequency response of discrete-time LTI system using DTFT.	S1	Lectures and Problem-based learning	Quizzes/ Midterm Exam
2.3	Apply DFT and IDFT to discrete-time signals.	S1	Lectures and Problem-based learning	Quizzes/ Midterm Exam
2.4	Perform Z and inverse Z transforms.	S1	Lectures and Problem-based learning	Quizzes/ Midterm Exam
2.5	Realize discrete-time LTI systems.	S1	Lectures and Problem-based learning	Quizzes/ Final Exam
2.6	Design IIR filters.	S2	Lectures and Problem-based learning Project-Based Learning	Final Exam
2.7	Design FIR filters.	S2	Lectures and Problem-based learning	Quizzes/ Final Exam
2.8	Utilize appropriate tools and/or software to collaboratively simulate, design, and implement DSP-based systems within the context of mini projects.	S5	Project-based learning	Deliverables/ outcomes of the project

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate effective teamwork skills by collaborating with peers in the successful completion of projects.	V2	Project-based learning	Rubrics

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Digital Signal Processing and Sampling Theorem	**3**
2.	Revision of discrete time signals and systems	**3**
3.	Discrete time Fourier transform	**3**
4.	Properties of DTFT	**3**
5.	Analyze frequency response of discrete-time LTI system using DTFT.	**3**
6.	Discrete Fourier Transform and its properties	**3**
7.	Inverse DFT	**3**
8.	Introduction to Fast Fourier Transform Algorithms (FFT)	**3**
9.	Z transform	**3**
10.	Properties of Z transform and region of conversion	**3**
11.	Inverse Z transform	**3**
12.	Structure for Discrete-Time Systems: Direct, Cascade, and Parallel forms	**3**
13	Design of IIR filter	**3**
14.	Design of IIR filter	**3**
15.	Design of FIR filter	**3**
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	3,6,9,13,14	20%
2.	Midterm Exam	8-9	25%
3.	Mini Project	10-14	15%
4.	Final Exam	17-19	40%

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

E. Learning Resources and Facilities

Essential References	A. Oppenheim, R. Schafer, J. Buck: Discrete-Time Signal Processing, Prentice Hall, ISBN 0-13-754920-2.
Supportive References	• Lecture Handouts • John G. Proakis and Dimitris G. Manolakis, Digital Signal Processing Principle algorithm and applications, 4^{th} Edition, Pearson, 2006.
Electronic Materials	Course Page on Blackboard
Other Learning Materials	None

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Classroom with 25 seats**
Technology equipment (projector, smart board, software)	**Data show, Blackboard Teaching-Learning Interface**
Other equipment (depending on the nature of the specialty)	**Reprographic facilities**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect through survey
Effectiveness of Students assessment	• Students • Head of the department • Vice dean	Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary
Quality of learning resources	Students	Indirect through survey
The extent to which CLOs have been achieved	Course Instructor	Direct through tests
Other	None	None

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

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1415/Semester-1/1445 H

DATE	30/10/2023

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-155

Field Experience Specification

Course Title:	*Practical*
Course Code:	*ELEN1495*
Program:	*Bachelor of Science in Electrical Engineering*
Department:	*Department of Electrical Engineering*
College:	*Faculty of Engineering*
Institution:	*University of Tabuk*
Field Experience Version Number:	***V4***
Last Revision Date:	*29 Oct 2023*

Table of Contents

A. Field Experience Details:

1. Credit hours: (4).

2. Level/year at which Field Experience is offered: (10th Level).

3. Time allocated for Field Experience activities

(16) Weeks	(64) Days	(512) Hours

4. Corequisite (or prerequisites if any) to join Field Experience

Departmental Approval

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	**Demonstrate knowledge relevant to training.**	**K1**	• Regular attendance at training locations. • Actively participating in different work tasks at the training location and linking them to theory.	• Weekly reports from training organization. • The overall assessment report of the training organization.	• Direct training supervisor. • Faculty responsible for practical training.
1.2	**Describe safety precautions in the training site.**	**K1**	Attending and/or receiving safety orientation by the training organization.	• Final report submitted by the student. • Practical training assessment interview.	Faculty responsible for practical training.
2.0	Skills				
2.1	**Apply relevant knowledge to solve engineering problems.**	**S1**	Perform the tasks assigned by the direct supervisor.	The overall assessment report of the training organization.	Direct training supervisor
2.2	**Illustrate the ability to gain experience as related to training.**	**S1**	Effective participation and involvement in relevant tasks at the training location	• The overall assessment report of the training organization. • Practical training assessment interview.	• Direct training supervisor • Faculty responsible for practical training.
2.3	**Demonstrate effective oral communications of the training activities.**	**S4**	• Team meetings at the training location • Discussions and communication of relevant information to different audiences as needed.	• The overall assessment report of the training organization. • Practical training assessment interview.	• Direct training supervisor • Faculty responsible for practical training.
2.4	**Demonstrate the ability to communicate the training activities in writing.**	**S4**	Produce a comprehensive informative report on the different aspects of field training.	• Final report submitted by the student.	• Faculty responsible for practical training.
3.0	Values, autonomy, and responsibility				

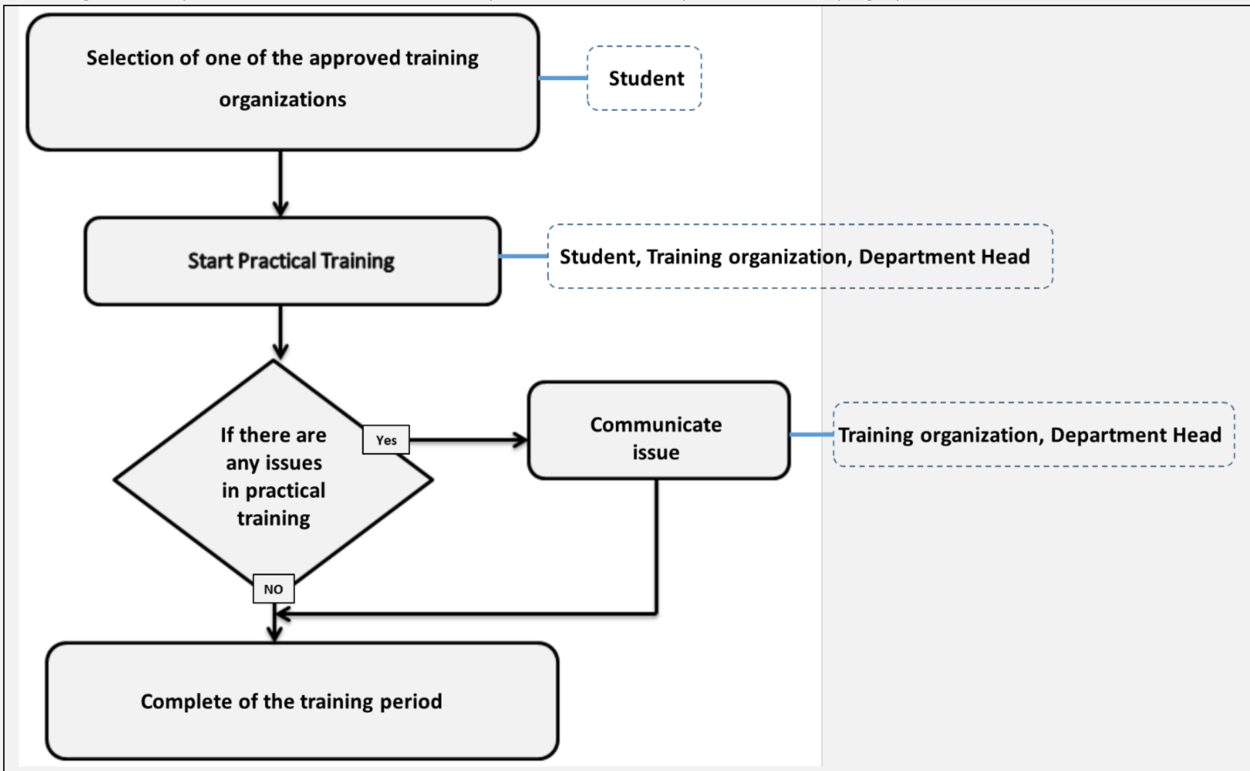
Code	Learning Outcomes	Aligned PLO Code	Training Activities	Assessment Methods	Assessment Responsibility
3.1	**Demonstrate compliance to ethical and professional standards.**	**V1**	Recognition and compliance with ethical codes and standards as practiced in the training location and/or within the training organization.	• The overall assessment report of the training organization. • Practical training assessment interview.	• Direct training supervisor. • Faculty responsible for practical training.
3.2	**Perform effectively within a team to accomplish assigned tasks.**	**V2**	Perform the tasks assigned by the direct supervisor.	The overall assessment report of the training organization.	Direct training supervisor.

*Assessment methods (i.e., practical test, field report, oral test, presentation, group project, essay, etc.).

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	✔	✔	✔	✔	✔

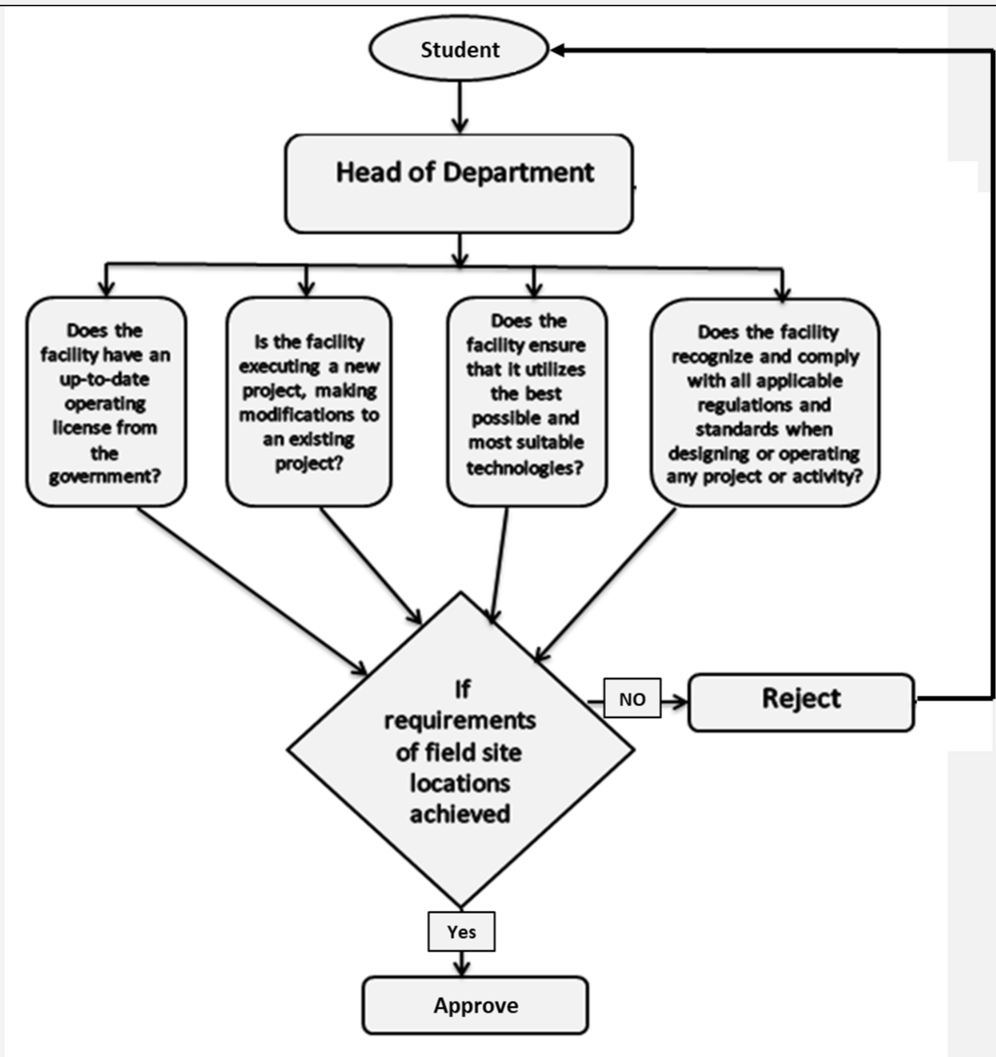
3. Field Experience Location Requirements

Suggested Field Experience Locations	General Requirements*	Special Requirements**
Saudi Electricity Company. Ministry of Environment Water & Agriculture. NEOM projects. BAE Systems Ministry of Transportation. ARAMCO company.	• Provides practical experience in one or more disciplines of FE programs. • Assures active participation of students in relevant activities at the training location. • Provides needed support to students throughout their training experience. • Commits to providing forms and assessments required by department/faculty. • Commits to cooperation with the FE training unit.	• Training activities must be complementary to the knowledge body in the study plan. • **Preferably** provides training and/or orientation on modern trends, software, and technologies.

*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



5. Safety and Risk Management

Potential Risks	Safety Actions	Risk Management Procedures
The expulsion of training without compelling reasons	Contract an agreement with the company/organization.	Select companies/organizations with an agreement in advance.
Injury to the trainee during training.	Contract an agreement with the company/organization.	Select companies/organizations with an agreement in advance.
Claim the college with the financial receivables.	Contract an agreement with the company/organization.	Select companies/organizations with an agreement in advance.

D. Training Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of Training and Assessment.	Students	Direct (online survey)
Extent of achievement of course learning outcomes.	Students	Indirect (CLOs survey)
Extent of achievement of course learning outcomes.	Teaching staff	Direct (oral presentation)
Quality of learning resources.	Student	Indirect (online survey)

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
Reference No.	Department Council meeting
Date	29 OCT, 2023

2023

TP-153

Course Specification

(Bachelor)

Course Title:	Career Competence in Electrical Engineering
Course Code:	ELEN1497
Program:	Bachelor of Science in Electrical Engineering
Department:	Department of Electrical Engineering
College:	Faculty of Engineering
Institution:	University of Tabuk
Version:	1
Last Revision Date:	11 October 2023

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (2)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (10th Level/ 5th Year)					
4. Course General Description:					
This course is tailored to assist senior students in launching their engineering careers by providing comprehensive preparation for standardized exams crucial for professional certification. Focused on the electrical engineering discipline, the curriculum covers key topics and subject areas tested in these exams to ensure participants develop a solid understanding of fundamental engineering principles. The class employs a hybrid teaching style, optimizing learning time and offering personalized assistance to enhance readiness for success in various standardized exams and, subsequently, in the participants' engineering careers.					
5. Pre-requirements for this course (if any)**:**					
Department Approval					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
The main objective of this course is to equip senior engineering students with the essential knowledge and skills needed for success in standardized exams relevant to the field of electrical engineering.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	0	0%
2	E-learning	30	100%
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		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	Demonstrate a comprehensive Knowledge and understanding of electrical engineering concepts.	K1	Lectures	Exams
2.0	**Skills**			
2.1	Solve a problem in the fundamental of Electrical engineering discipline	S1	Lectures and Problem-based learning	Exams
3.0	**Values, autonomy, and responsibility**			
3.1	Recognize ethics and professional practice in engineering.	V1	Lectures	**Exams**
3.2	Apply new knowledge in electrical engineering discipline	V3	Lectures	**Exams**

C. Course Content

No	List of Topics	Contact Hours
1.	Mathematics	2

2.	Probability and Statistics	2
3.	Ethics and Professional Practice	2
4.	Engineering Economics	2
5.	Properties of electrical Materials	2
6.	Circuit analysis (DC and AC steady State)	2
7.	Linear Systems and Signal Processing	2
8.	Electronics	2
9.	Power Systems	2
10.	Electromagnetics	2
11.	Control Systems	2
12.	Communications	2
13.	Computer Networks	2
14.	Digital Systems	2
15.	Computer systems and software Engineering	2
	Total	**30**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignments	-	20%
2.	Practice Exam 1	3	20%
.3	Practice Exam 2	16	60%

*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	Lindeburg, M., “Rapid Preparation for the Fundamentals of Engineering Exam,” 3rd Edition 2010
Supportive References	FE Handbook , PPI FE Book
Electronic Materials	KAPLAN PPI online Platform
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**None**
Technology equipment (projector, smart board, software)	**Blackboard Teaching-Learning Interface**
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	Indirect through survey
Effectiveness of Students assessment	• Students • Head of the department • Vice dean	Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary
Quality of learning resources	Students	Indirect through survey
The extent to which CLOs have been achieved	Course Instructor	Direct through Exams
Other	None	None

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1497/Semester-1/1445 H
DATE	11/10/2023

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
(Bachelor)

Course Title: Project	
Course Code: ELEN1498	
Program: Bachelor of Science in Electrical Engineering	
Department: Department of Electrical Engineering	
College: Faculty of Engineering	
Institution: University of Tabuk	
Version: 4	
Last Revision Date: 30 October 2023	

Table of Contents

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: (8th Level/ 4th Year)					
4. Course general Description:					
This course represents the culmination of the academic journey for electrical engineering students, where they tackle complex engineering challenges by applying their knowledge and skills. Through teamwork, hands-on experience, project management, and a focus on effective oral and written communication skills, students acquire practical skills in designing, analyzing, and testing electrical systems while fostering creativity and collaboration. This capstone experience prepares them for successful careers in electrical engineering.					
5. Pre-requirements for this course (if any)**:**					
Department Approval					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
This course aims to provide electrical engineering students with a platform to apply their knowledge, fostering practical skills in system design, analysis, and testing. It emphasizes teamwork, effective communication, and ethical responsibility while encouraging innovation and preparing students for successful engineering careers.					

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**	0
.2	**Laboratory/Studio**	0
.3	**Field**	0
.4	**Tutorial**	0
.5	**Project-based learning**	45
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 demonstrate a comprehensive knowledge and understanding of electrical engineering principles and concepts pertinent to the relevant project.	**K1**	Project-Based Learning with Guided Literature Review Assignments	Rubrics
2.0	**Skills**			
2.1	To formulate and solve complex engineering problems by applying principles of engineering and basic sciences.	**S1**	Project-Based Learning with Faculty Mentorship and Guidance	Rubrics
2.2	To apply engineering design principles to develop solutions that meet specified needs in the project.	**S2**	Project-Based Learning with Faculty Mentorship and Guidance	Rubrics
2.3	To develop, conduct, and analyze	**S3**	Project-Based Learning with	Rubrics

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	appropriate experimentation, and use engineering judgment to draw conclusions during the SDP.		Guidance on Data Collection and Analysis, and Mentoring on Engineering Judgment and Decision-Making	
2.4	To communicate the results and progress of the project through an oral presentation.	**S4**	Project-Based Learning for presentation skills development through workshops, mock sessions with feedback, and guidance on effective materials.	Oral presentations.
2.5	To communicate the results and progress of the project by writing a technical report.	**S4**	Project-Based Learning for Technical Writing Skills through workshops and guidelines.	Reports.
2.6	To effectively use modern engineering and IT tools to solve and evaluate complex engineering problems within the limitations of available resources.	**S5**	Project-based learning with a focus on tool integration.	Rubrics
2.7	To identify and evaluate the issues and constraints of sustainability, economics, environment, politics, health and safety, and society, as they relate to engineering	**S6**	Lectures Open discussions Seminars	Rubrics.

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	solutions developed in the project.			
3.0	**Values, autonomy, and responsibility**			
3.1	To recognize and address ethical and professional responsibilities in engineering situations during the project.	**V1**	Lectures Augmented by Ethics Seminars, Discussions, and Mentorship on Professional Conduct	Rubrics
3.2	To function as an effective team member in the project, demonstrating leadership, collaboration, goal setting, task planning, and objective achievement.	**V2**	Project-Based Learning for Team-building skills workshops and mentorship for collaborative success.	Rubrics Oral Presentation Reports
3.3	To embrace the importance of lifelong learning by acquiring and applying new knowledge as required, using appropriate learning strategies in the context of the project.	**V3**	Encouraging Independent Learning through Project-Based Learning	Rubrics

C. Course Content

No	List of Topics	Contact Hours
1.	Initial Project Proposal	3
2.	Team building	3
3.	Project planning and management	3
4.	Literature review	3

5.	Literature review	3
6.	Problem definition	3
7.	Consideration of constraints of sustainability, economics, environment, politics, health and safety, and society needs	3
8.	The design process	3
9.	The design process	3
10.	Initial Schematic	3
11.	Creativity, problem solving, and analyzing obtained results	3
12.	Creativity, problem solving, and analyzing obtained results	3
13.	Prepare the final report	3
14.	Prepare the final report	3
15.	Prepare the final presentation	3
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Class work	1st to 15th	40%
2.	Project oral Presentation	16th	20%
.3	Project Report	16th	20%
.4	Project findings: Design layouts, Simulations results, poster, or prototype...	16th	20%

*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	Provided by project advisor according to discipline and project topic
Supportive References	Cory J. Mettler, Engineering Design - A Survival Guide to Senior Capstone, Springer 2023
Electronic Materials	Provided by project advisor according to discipline and project topic
Other Learning Materials	Provided by project advisor according to discipline and project topic

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms with capacity that matches the student enrollment and provide a positive learning environment.
Technology equipment (projector, smart board, software)	Access to a computer laboratory with relevant software (Microsoft Office, modelling software), if applicable.
Other equipment (depending on the nature of the specialty)	Access to a functional lab, library, electronic learning resources, workshops.

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect through survey
Effectiveness of Students assessment	• Students • Head of the department • Vice dean	Indirect, where students use survey and head of the department and vice dean review the grades excel sheets and meet with instructors and provide feedback when necessary
Quality of learning resources	Students	Indirect through survey
The extent to which CLOs have been achieved	Course Instructor	Direct through observation and findings
Other	None	None

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

G. Specification Approval

COUNCIL /COMMITTEE	Department of Electrical Engineering Council
REFERENCE NO.	ELEN1498/Semester-1/1445 H
DATE	30/10/2023

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

T-104
2022-2023

Course Specification

Course Title:	**English Language Skills 1**
Course Code:	**ELS1101**
Program:	**All programs (Except medical faculties)**
Department:	**Department of English Language Skills**
College:	**N/A**
Institution:	**Institute of Languages**
Version:	*Course Specification Version Number*
Last Revision Date:	**Summer Term AY 2022-2023**

Table of Contents:

A. General information about the course:

Course Identification		
1. **Credit hours:**	3	
2. Course type		
a.	University ☒ College ☒ Department☒ Track☐ Others☐	
b.	Required ☒ Elective☐	
3. Level/year at which this course is offered: First Year		
4. Course general Description ELS1101 is a blended medium integrated skills English as a Foreign Language (EFL) A1 to Lower A2 level course designed to introduce students to General English (GE) content. This course introduces students to common themes and scenarios they are likely to encounter in their daily lives. Students taking this course will be introduced to learner autonomy and skills for educational success.		
5. Pre-requirements for this course (if any): None		
6. Co- requirements for this course (if any): None		
7. Course Main Objective(s) The purpose of this course is to develop students' English language proficiency towards a lower A2 CEFR level of General English.		

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom		
2.	E-learning		
3.	Hybrid* • Traditional classroom • E-learning		100%
4.	Distance learning		
All course components (items/outcomes) are applied through a Blended Medium of Instruction approach.			

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures*	240**
2.	Laboratory/Studio	
3.	Field	

4.	Tutorial	
5.	Others (specify)	
	Total	240***

**Due to the nature of EFL field, lessons typically also include practical applications of language and skills' development.*
***15hrs/week for 16 weeks.*
****The expected time required of students to spend online is included in the total.*

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	Determine the main idea from graded listening about simple everyday topics, describing objects and possessions, simple questions and instructions addressed carefully and slowly.	ILO1	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	Summative Assessment
1.2	Identify detailed information from graded listening, such as people talking about themselves and their families, provided the listening is very slowly and clearly pronounced while using simple words.	ILO1	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the	Summative Assessment

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			students and classroom.	
1.3	Determine main idea from graded reading about short, simple texts by understanding familiar names, words and basic phrases.	ILO1	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	Summative Assessment
1.4	Identify detailed information from graded reading by finding basic information in posters, adverts or catalogues, following short simple written directions.	ILO1	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	Summative Assessment

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.5	Determine the main idea in common and everyday situations in videos, by exploiting visual information and general knowledge, working towards CEFR level A2.	ILO1	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	Alternative Assessment
1.6	Recognize simple grammatical structures such as simple tenses, pronouns, and the joining of phrases with words like "and, but, because, and then", working towards CEFR A2.	ILO1	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	Summative & Alternative Assessment

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.7	Recognize varied grammatical structures such as tenses, working towards CEFR B1.	ILO1	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	Summative & Alternative Assessment
1.8	Recognize familiar words and phrases in everyday situations and topics, and identify changes in the topics of videos, working towards CEFR B1.	ILO1	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	Summative & Alternative Assessment
1.9	Identify spoken phrases and expressions related	ILO1	The Communicative Approach and Direct	Alternative Assessment

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	to areas of immediate priority, working towards CEFR B1.		Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom**.**	
2.0	Skills			
2.1	Formulate questions about other people, where they live, people they know and what they possess, where to find familiar objects, answering questions, asking for directions, asking for things and giving things working towards CEFR A2 level.	ILO3	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom**.**	Summative Alternative
2.2	Demonstrate basic repertoire of phrases to talk about graded	ILO3	The Communicative Approach and Direct Method are the	Alternative Assessment

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	videos, by exploiting visual information and general knowledge, working towards CEFR level A2.		standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	
2.3	Produce written words, phrases, and sentences about one's self and family working towards CEFR A2 level.	ILO3	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	Summative & Alternative Assessment
2.4	Formulate and respond to questions about one's self related to where they live, who they know and what	ILO3	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms	Alternative Assessment

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	they possess, how people are, as well as to react to news, statements on very familiar topics towards CEFR A2 level.		for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	
2.5	Compose written text in the form of simple phrases and sentences, complete a questionnaire with personal details, and write a simple postcard working towards CEFR A2 level.	ILO3	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	Summative & Alternative Assessment
2.6	Produce simple spoken phrases about people and places, describe clothes or other familiar objects, and indicate time using phrases,	ILO3	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills.	Alternative Assessment

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	working towards CEFR A2 level.		Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	
2.7	Describe themselves, what they do and where they live, understand simple phone messages, working towards an A2 CEFR level.	ILO3	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	Alternative Assessment
2.8	Express main points, simple and routine tasks requiring a simple and direct exchange of information on familiar matters, through spoken language, working towards CEFR B1.	ILO3	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary	Alternative Assessment

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	
2.9	Compose a written paragraph on past activities, everyday life, and personal experiences working towards CEFR B1.	ILO3	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	Summative Assessment
2.10	Produce spoken language in telling with detailed familiar descriptions, asking for, and giving opinions working towards CEFR B1	ILO3	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional	Alternative Assessment

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	
2.11	Apply culturally appropriate themes in speaking at the target CEFR level.**	ILO3/ILO5	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	Alternative Assessment
2.12	Describe plans, arrangements and alternatives, working towards CEFR B1.	ILO3	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various	Summative & Alternative Assessment

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom**.**	
3.0	Values, autonomy, and responsibility			
3.1	Recognize and use polite forms of greetings, farewells, and introductions ranging from the simplest forms to the A2 CEFR level.	ILO7	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom**.**	Summative & Alternative Assessment
3.2	Apply culturally appropriate themes in speaking at the target CEFR level.**	ILO3/ILO5	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational	Alternative Assessment

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	
3.3	Demonstrate an ability to competently complete language tasks within appropriate time/date constraints.	ILO9	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	Alternative Assessment
	Use simple but effective common expressions and routines to socialize appropriately towards B1 CEFR level.	ILO7	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based,	Alternative Assessment

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			and Scenario Based among other methods as appropriate for the students and classroom.	

*https://www.teachingenglish.org.uk/professional-development/teachers/knowing-subject/c/communicative-approach
https://www.teachingenglish.org.uk/professional-development/teachers/knowing-subject/d-h/direct-method
**The Learning objective corresponds to two ILOs.*

C. Course Content

No	List of Topics		Contact Hours
Module 1	Listening, Reading & Vocabulary Building	Meetings/Making Reservations; Questions/Objects of old; People and possessions/Gadget Free Life; My life/Schedules; Style and design/ Architecture	80hrs
	Grammar & Mechanics	Verb (Be), Proper Nouns; Question Words and Questions/Demonstrative pronouns; Subject pronouns; Regular plural nouns; Numbers; Prepositions of place; Singular and plural Possessive determiners + Possessive 's; Have got + negative + questions; Irregular plurals; Adjectives + noun phrases; opposite adjectives; Yes-no questions-answers/ Present simple positive + negative; Yes-no questions; Common verbs; Daily activities; verb + Nouns phrases; Present simple + he, she, it; Verb phrases; Contractions positive + negative/ Adverbs of frequency; Wh-questions; Present simple; Colors + clothes; Adjectives; Adjective modifiers; Parts of the body; Plural forms; And+ but + because	
	Speaking	Talking about time; Using Everyday expressions; Travel information	
	Writing	Filling in forms; Writing an informal email; Social media messaging;	
	Autonomous Skills	Using online resources to develop language skills; Flipped Classroom	
	e-Content	Grammar, vocabulary, reading, listening, and pronunciation review activities and games.	
Module 2	Listening, Reading & Vocabulary Building	Places and facilities/Looking for a residence; Skills and interests/Unusual Hobbies; Our past/The story of flight Unusual stories/Weather; New places, new projects/Work place (Cafe)	80hrs
	Grammar & Mechanics	*There is-are + questions; Places in a town; rooms and furniture; Where vs When; Explaining problems; Can/can't + questions; like + ing; Adverbs of manner; Skills + abilities + hobbies; Like +*	

		love vs hate; Scanning for specific information; Simple requests; Verb (Be) past; Simple past regular verbs; object pronouns; Time expressions-past; Past vs present; Expressions for special occasions;	
	Speaking	Ordering food & Drink	
	Writing	*Venue & event reviews; Posting on social media; Writing biographies*	
	Autonomous Skills	Using online resources to develop language skills; Flipped Classroom	
	e-Content	Grammar, vocabulary, reading, listening, and pronunciation review activities and games.	
Module 3	Listening, Reading & Vocabulary Building	Your world/Cities; My day/ A day in a family's life; The world of work/At the hospital; Places and things/Skyscrapers, high towers; Clothes and shopping/At the local market; The past/Ancient Cities	80 hrs
	Grammar & Mechanics	*Present simple (be); Possessive determiners; Countries + nationalities + languages; Family; Plural nouns regular + irregular; Contractions positive + negative; Present simple positive + negative; Adverbs of frequency; Daily activities; Telling time; Verb + preposition; Third person; conjunctions; Yes/no questions; Wh-questions; Jobs + work; Suffix; There is + are; Articles; Places in a town; Prepositions of place; Opposite adjectives; Pronoun referencing; Imperatives; Can + could + negatives; Present continuous; Clothes and accessories + Adjectives + Adverbs; Was –were; Simple Past regular verbs; Time expressions, Common verb collocations; Adverbs of degree; Simple verbs.*	
	Speaking	*Asking for personal information and checking; Making suggestions; Making requests; Asking and giving directions;*	
	Writing	*Writing a personal profile; Describing where you live in writing; Opening and closing emails; Product review; Writing a tweet or text message.*	
	Autonomous Skills	Using online resources to develop language skills; Flipped Classroom	
	e-Content	Grammar, vocabulary, reading, listening, and pronunciation review activities and games.	
Total			240 hrs

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
Summative Assessment			
1.	Module 1 Exam	Week 6	24%
2.	Module 2 Exam	Week 11	23%

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
Summative Assessment			
3.	Module 3 Exam	Week 17*	23%
Alternative Assessment			
4.	Autonomous Skills	Week 5, 10, 16	5%
5.	Flipped Classroom	Week 5, 10, 16	5%
6.	Targeted Speaking	Week 5, 10, 16	9%
7.	e-Content	Week 16	5%
8.	Quizzes	Weeks 5, 10, 16	6%

**Final Module exams are set by the Deanship of Admissions and Registration starting after the completion of Week 16.*

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Navigate 1 Course Book + Workbook Navigate 2 course Book + Workbook ELS1101 Portfolio
Supportive References	
Electronic Materials	LMS (Blackboard) www.oxfordlearn.com www.quill.org www.oxfordlearnersdictionaries.com Navigate 1- Online practice Navigate 2 - Online practice
Other Learning Materials	Teachers' worksheets, PowerPoint slides and topic-related videos

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom with seating capacity for 25 students and computer labs with an internet connection.
Technology equipment (projector, smart board, software)	Data show/projector Smartboard/Whiteboard Instructor email Audio recording software and device. E.g. (Audacity) Online collection of assignments (Dropbox/Blackboard)
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	Students Internal reviewer (IL/ Coordinators Professional Development Unit	Formal web-based- survey Class formal/ Informal Observation
Effectiveness of students assessment	IL/ DELS	Questionnaire/ Survey/Results
Quality of learning resources	Students/Instructors/Coordinators	Questionnaire/Results
The extent to which CLOs have been achieved	Assessment Unit Quality Assurance Unit	Student Results/Pre-Post testing/Benchmarking

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

G. Specification Approval Data

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

T-104
2022-2023

Course Specification

Course Title:	**English Language Skills 2**
Course Code:	**ELS1102**
Program:	**All programs (Except medical faculties)**
Department:	**Department of English Language Skills**
College:	**N/A**
Institution:	**Institute of Languages**
Version:	*Course Specification Version Number*
Last Revision Date:	**Summer Term AY 2022-2023**

Table of Contents:

A. General information about the course:

Course Identification					
1. Credit hours:	3				
2. Course type					
a.	University ☒	College ☒	Department☒	Track☐	Others☐
b.	Required ☒	Elective☐			
3. Level/year at which this course is offered: First Year					
4. Course general Description ELS1102 is a blended medium integrated skills English as a Foreign Language (EFL) A2+ to Lower B1 level course designed to introduce students to General English (GE) content. This course introduces students to common themes and scenarios they are likely to encounter in their daily and university lives. Students taking this course will apply autonomous learning as well as other skills necessary for educational success.					
5. Pre-requirements for this course (if any): Passing English Language Skills 1 (ELS1101)					
6. Co- requirements for this course (if any): None					
7. Course Main Objective(s) The purpose of this course is to develop students' English language proficiency towards a lower B1 CEFR level of General English.					

1. Teaching mode (mark all that apply)

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

**All course components (items/outcomes) are applied through a Blended Medium of Instruction approach.*

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures*	240**
2.	Laboratory/Studio	
3.	Field	

4.	Tutorial	
5.	Others (specify)	
	Total	240***

**Due to the nature of EFL field, lessons typically also include practical applications of language and skills' development.*
***15hrs/week for 16 weeks.*
****The expected time required of students to spend online is included in the total.*

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	Determine the main idea in graded listening about everyday things, short simple stories, and main idea of TV news.	ILO1	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	Summative assessment
1.2	Identify detailed information in graded listening about short, clear, simple messages, announcements and instructions,	ILO1	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the	Summative assessment

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			students and classroom.	
1.3	Determine the main idea in graded reading about authentic themes on familiar subjects, which consist of high-frequency, everyday or job-related language. short newspaper / magazine stories, especially when they are illustrated,	ILO1	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	Summative assessment
1.4	Identify detailed information in graded reading about instructions expressed in simple language, short everyday stories about familiar subjects if the text is written in simple language, simple texts, emails and letters from friends or colleagues.	ILO1	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	Summative assessment

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.5	Determine the main idea in graded B1 academic listening material.	ILO1	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	Summative assessment
1.6	Identify detailed information in graded B1 academic listening material.	ILO1	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	Summative assessment
2.0	Skills			

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.1	Synthesize into a summary stories and give simple directions and instructions through spoken language, in the target level.	ILO3	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	Summative assessment / Alternative assessment
2.2	Produce spoken language describing past activities and personal experiences, working towards CEFR B1	ILO1/ILO3	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	Summative assessment / Alternative assessment
2.3	Develop a coherent sequence of events	ILO3	The Communicative Approach and Direct	Alternative assessment

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	narrated at the target CEFR level.		Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	
2.4	Apply B1 syntax in the production of spoken language.	ILO3/ILO1	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	Summative assessment / Alternative assessment
2.5	Produce B1 spoken language to describe a variety of academic-	ILO3	The Communicative Approach and Direct Method are the standard* the DELS	Summative assessment / Alternative assessment

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	themed subjects at the B1 CEFR level.		uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	
2.6	Apply note-taking techniques while listening to B1 academic listening material.	ILO3	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	Alternative assessment
2.7	Infer positions/attitudes and opinions from academic listening	ILO3	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms	Summative assessment / Alternative assessment

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	material at the B1 CEFR level.		for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	
2.8	Produce a spoken reflection on graded academic video content at the B1 CEFR level	ILO3	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	Alternative assessment
3.0	Values, autonomy, and responsibility			
3.1	Apply culturally appropriate themes in speaking at the target CEFR level.	ILO9	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms	Alternative assessment

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	
3.2	Demonstrate an ability to competently complete language tasks within appropriate time/date constraints.	ILO9	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills. Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	Alternative assessment
3.3	Apply culturally appropriate themes in speaking at the B1 CEFR level.	ILO5	The Communicative Approach and Direct Method are the standard* the DELS uses in all classrooms for all four language skills.	Alternative assessment

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			Instructors are encouraged to vary their in-class instructional applications to include various modern educational methods such as: PPP, TTT, Task Based, and Scenario Based among other methods as appropriate for the students and classroom.	

******https://www.teachingenglish.org.uk/professional-development/teachers/knowing-subject/c/communicative-approach*
https://www.teachingenglish.org.uk/professional-development/teachers/knowing-subject/d-h/direct-method

C. Course Content

No	List of Topics		Contact Hours
Module 1	Listening, Reading & Vocabulary Building	Health and fitness/Activities in a city; Travel and transport/Adventure holidays; Cooking and eating/ Directions on how to make a ... (food); The world around us/Natural wonders & National Parks;	80hrs
	Grammar & Mechanics	*Simple Past irregular verbs + negatives; Healthy lifestyle; Time sequences; Showing opinions + agreeing + disagreeing; Simple past questions; Should + negative; Have to + negative; Transport + holidays; Expressions using get + take + have; Simple past using Did; Questions simple present + past; Countable vs uncountable nouns; Quantifiers; Food + drink + the kitchen; Understanding numbers; Comparatives; Superlatives; The weather; Adjective + noun collocations; Reasons + preferences; Verbs + noun phrases, going to for plans & intentions, infinitives of purpose, strengthening adjectives, Present perfect to communicate past experiences; verb-noun phrases, present perfect vs simple past+verb forms, Past participles, Pronouns in writing*	
	Speaking	*Asking about + recommending a place; Describing places; Speaking about technology;*	
	Writing	*Comment on a website; An email about your holiday or vacation; Writing a formal/informal notice; Writing a review*	
	Autonomous Skills	Project Milestone 1; Using online resources to develop language skills; Flipped Classroom	
	e-Content	Grammar, vocabulary, reading, listening, and pronunciation review activities and games.	

Module 2	Listening, Reading & Vocabulary Building	Sociology & First Impressions, Comparing and contrasting; Natural Science + The food we eat, Listening for cause and effect, Interviews, Psychology + Is change good or bad?, Word webs; Marketing + Advertising and its effect on behavior, Facts vs opinions, Evaluating claims, Context for meaning, Mind mapping.	80hrs
	Grammar & Mechanics	Suffixes, Auxiliary verbs (do,be, have), Contractions with auxiliary verbs, Adjective-noun collocations, Quantifiers + count and noncount nouns; Time markers, Tag questions, Using modals to express attitude	
	Speaking	Video Reflections, Giving a short talk, Asking for & giving reasons in discussions;	
	Autonomous Skills	Project Milestone 2; Using online resources to develop language skills; Flipped Classroom	
	e-Content	Grammar, vocabulary, reading, listening, and pronunciation review activities and games.	
Module 3	Listening, Reading & Vocabulary Building	Behavioral Science + Taking risks and change in our lives, Listening for numbers, Strength and relevance of evidence, Word families; Economics + Money and happiness, Prefixes, Simple past and present perfect,	80 hrs
	Grammar & Mechanics	Past Perfect, Contractions, Neurology +Artificial Intelligence, Gerunds and infinitives as objects of verbs; Signposts in listening,	
	Speaking	Video Reflections, Short Presentation, Asking and giving clarifications, paired discussion.	
	Autonomous Skills	Project Milestone 3; Using online resources to develop language skills; Flipped Classroom	
	e-Content	Grammar, vocabulary, reading, listening, and pronunciation review activities and games.	
Total			240 hrs

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
Summative Assessment			
1.	Module 1 Exam	Week 6	24%
2.	Module 2 Exam	Week 11	23%
3.	Module 3 Exam	Week 17*	23%
Alternative Assessment			
4.	Autonomous Skills	Week 5, 10, 16	5%
5.	Flipped Classroom	Week 5, 10, 16	5%
6.	Reflections & Targeted Speaking	Week 5, 10, 16	9%
7.	e-Content	Week 16	5%
8.	Quizzes	Weeks 5, 10, 16	6%

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
Summative Assessment			
*Final Module exams are set by the Deanship of Admissions and Registration starting after the completion of Week 16.			

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Navigate 2 Course Book + Workbook QSkills for Success Listening & Speaking Level 3 Special Edition, Third edition ELS1102 Portfolio
Supportive References	
Electronic Materials	LMS (Blackboard) www.oxfordlearn.com www.quill.org www.oxfordlearnersdictionaries.com Navigate 2 - Online practice QSkills for Success Listening & Speaking Level 3 - Online Practice
Other Learning Materials	Teachers' worksheets, PowerPoint slides and topic-related videos

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom with seating capacity for 25 students and computer labs with an internet connection.
Technology equipment (projector, smart board, software)	Data show/projector Smartboard/Whiteboard Instructor email Audio recording software and device. E.g. (Audacity) Online collection of assignments (Dropbox/Blackboard)
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	Students Internal reviewer (IL/	Formal web-based- survey

Assessment Areas/Issues	Assessor	Assessment Methods
	Coordinators Professional Development Unit	Class formal/ Informal Observation
Effectiveness of students assessment	IL/ DELS	Questionnaire/ Survey/Results
Quality of learning resources	Students/Instructors/Coordinators	Questionnaire/Results
The extent to which CLOs have been achieved	Assessment Unit Quality Assurance Unit	Student Results/Pre-Post testing/Benchmarking

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

Assessment Methods (Direct, Indirect)

G. Specification Approval Data

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
(Bachelor)

Course Title:	Writing 1
Course Code:	LANT1203
Program:	English Language Program
Department:	Languages and Translation Department
College:	Education and Arts College
Institution:	University of Tabuk
Version:	T-153 (2023)
Last Revision Date:	19 October 2023

Table of Contents

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: (Level 3)					

4. Course general Description:

Writing 1 develops students' skills to write well-structured and meaningful paragraphs. The course begins by covering pre-writing techniques and moves onward to more defined paragraph-related elements including topic sentences, supporting sentences, concluding sentences, and paragraph coherence and unity. A review of appropriate grammatical structures is also provided where necessary. Two kinds of paragraphs are highlighted in this course: descriptive and narrative.

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

None

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

NA

7. Course Main Objective(s):

The purpose of writing 1 is to develop learners' skills to write well-structured and meaningful paragraphs. Also, it aims to familiarize learners with pre-writing techniques. Learners will be able to recognize and develop paragraph elements such as topic sentence, supporting sentences, concluding sentences, and paragraph coherence and unity. They will be able to practice writing two kinds of paragraphs: descriptive and narrative.

2. Teaching mode (mark all that apply)

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

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	22.5
2.	**Laboratory/Studio**	-
3.	**Field**	-
4.	**Tutorial**	-
5.	**Others (specify)**	22.5
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 a well-structured paragraph with a clear topic sentence, well-developed supporting ideas, and a relevant conclusion.	**K1**	Lectures Group discussions Teacher-guided activities Tutorial Hands-on exercise	Exam questions and homework assignments to write two types of paragraphs covered in class
1.2	Identify paragraph parts: topics sentence, supporting sentence, and concluding sentence.	**K1**		Exam questions and homework assignments to identify parts of supplied paragraphs
1.3	Recognize two different paragraph types: descriptive and narrative.	**K1**		Exam questions and homework assignments to write two types of paragraphs covered in class
2.0	**Skills**			
2.1	Write a well-structured paragraph with a clear topic sentence, well-developed supporting	**S1**	Lectures Group discussions	Exam questions and homework assignments to evaluate the

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	ideas, and a relevant conclusion.		Teacher-guided activities Tutorial Hands-on exercise	unity and coherence of paragraphs using supplied rubrics.
2.2	Analyze paragraph parts: topics sentence, supporting sentence, and concluding sentence.	**S1**		
2.3	Employ two different paragraph types: descriptive and narrative.	**S1**		
3.0	**Values, autonomy, and responsibility**			
3.1	Adhere to academic values and ethics.	**V1**	Lectures Group discussions Teacher-guided activities	1.Class participation 2.Exams 3. Assignments
3.2	Complete autonomous and collaborative tasks with responsibility.	**V2**	Lectures Group discussions Teacher-guided activities	1.Class participation 2.Exams 3.Assignments
...				

C. Course Content

No	List of Topics	Contact Hours
1.	The Sentence and the Paragraph: Formatting a paragraph, Paragraph organization and the topic sentences	3
2.	The Sentence and the Paragraph: Supporting sentences, Concluding sentences, Unity within a paragraph and Coherence within a paragraph	3
3.	The Sentence and the Paragraph: Simple sentence structure, Punctuation and capitalization, Fragments and Run-on sentences.	3
4.	Descriptive Paragraphs: Descriptive organization, Brainstorming ideas and Brainstorming vocabulary Writing an outline	3
5.	Descriptive Paragraphs: Using specific language, using adjectives in descriptive writing and Using Be to describe and define.	3
6.	Descriptive Paragraphs: Practice using specific language, Practice using adjectives in descriptive writing and Practice writing with a time limit	6
7.	Narrative Paragraphs: Narrative organization, brainstorming ideas, brainstorming vocabulary and writing an outline.	3
8.	Narrative Paragraphs: Using sensory and emotional details, showing order of events in narrative paragraphs, showing simultaneous events and writing a first draft	3
9.	Narrative Paragraphs: Using the simple past, Using the past continuous Editing, and rewriting first draft	3
10.	Narrative Paragraphs: Review sensory and emotional details, Review order of events and Practice writing with a time limit.	3

11.	Focused Paragraph writing practice, Brainstorming, Outlining, Write first draft and Exchanging peer feedback	12
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Homework	throughout	20%
2.	Midterm Exam 1	6	20%
3.	Midterm Exam 2	12	20%
4.	Final Exam	16	40%

*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	Savage, A. & Mayer, P. (2017). *Effective academic writing 1* (2nd Edition). Oxford,UK: Oxford University Press.
Supportive References	Oshima Alice, Hogue Ann. (2006). *Writing Academic English* (4th Edition). The Longman Academic Writing Series
Electronic Materials	Greetham, B. (2013). *How to Write Better Essays: Palgrave Macmillan.*
Other Learning Materials	http://www.eslcafe.com/bookstore/writing.html https://learnenglish.britishcouncil.org/skills/writing https://www.engvid.com/writing-skills-paragraph/ https://www.grammarly.com/?q=essay&utm_source=google&utm_medium=cpc&utm_campaign=11862360209&utm_content=487962301813&utm_term=mla%20style&matchtype=b&placement=&network=g&gclid=CjwKCAjwkvWKBhB4EiwA-GHjFmVyBziLRjBc-M8doRAuASS6fY6UjWBHh8KJLRgFwFiLwt2a_RgDExoCoK4QAvD_BwE&gclsrc=aw.ds https://owl.purdue.edu/

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Computer lab
Technology equipment (projector, smart board, software)	Classrooms equipped with data shows
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. Direct method: Looking at actual samples of student work in the course such as assignments, projects...etc. 2. Indirect method: Faculty-student meetings to get students' oral feedback. Surveys: Confidential (anonymous) completion of a course evaluation questionnaire
Effectiveness of Students' assessment	Faculty	Assessment of the Course Reports and the Program Annual Report
Quality of learning resources	Faculty / Students	Assessment of the Course Reports and the Program Annual Report
The extent to which CLOs have been achieved	Coordinators / Program Leaders	Assessment of the Course Reports and the Program Annual Report
Teaching by the instructor or by the department	Peer Reviewer	1. Direct method: Looking at actual samples of student work in the course such as assignments, projects...etc. 2. Indirect method (survey): Regular meetings between the teachers and the course coordinator Surveys: Confidential (anonymous) completion of a course evaluation questionnaire
Improvement of teaching	Program chair	Assessment of the Course Reports and the Program Annual Report
Standards of student achievement	Faculty	Assessment of the Course Reports and the Program Annual Report
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Council of Languages and Translation Department
REFERENCE NO.	
DATE	30\5\2023

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification

(Bachelor)

Course Title:	Writing 2
Course Code:	LANT1206
Program:	English Language Program
Department:	Languages and Translation Department
College:	Education and Arts College
Institution:	University of Tabuk
Version:	T-153
Last Revision Date:	2023

Table of Contents

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: (Level 5)					
4. Course general Description:					
Writing 2 develops students' skills to write academic essays. This covers the organization, structure, coherence and unity of short essays and emphasizes the use of pre- writing techniques like brainstorming, outlining, and graphic organizers. The essay typeshighlighted in this course include descriptive essays and narrative essays. A review of appropriate grammatical structures and common writing mistakes is also provided where necessary. Extensive practice in college-level writing and reading is necessary. Students will write and peer-review a variety of essays through a process- oriented approach to writing.					
5. Pre-requirements for this course (if any)**:**					
LANT1203 Writing 1					
6. Pre-requirements for this course (if any)**:**					
NA					
7. Course Main Objective(s):					
The purpose of Writing 2 to is to develop students' skills to write well-structured and meaningful essays. Also to familiarize students with essay structure, and pre-writing techniques. It will develop students' skills in evaluating essay unity and coherence as well as writing accurate and well-formatted texts.					

2. Teaching mode (mark all that apply)

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

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

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	22.5
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	
5.	Others (specify)	22.5
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 a well-structured essay of three paragraphs or more with introduction, body and conclusion showing coherence and unity of ideas and with a minimal amount of formal and formatting errors.	**K1**	Lectures Group discussions Teacher-guided activities Tutorial Hands-on exercise	Exam questions and homework assignments to write two types of paragraphs covered in class
1.2	Identify essay parts: introduction, thesis statement, body, conclusion.	**K1**	Lectures Group discussions Teacher-guided activities Tutorial Hands-on exercise	Exam questions and homework assignments to identify parts of supplied paragraphs

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.3	Demonstrate thesis statement parts: topic and controlling idea.	K1	Lectures Group discussions Teacher-guided activities Tutorial Hands-on exercise	Exam questions and homework assignments to write two types of paragraphs covered in class
2.0	**Skills**			
2.1	Write a well-structured essay of three paragraphs or more with introduction, body and conclusion showing coherence and unity of ideas and with a minimal amount of formal and formatting errors.	**S1**	Lectures Group discussions Teacher-guided activities Tutorial Hands-on exercise	Exam questions and homework assignments to evaluate the unity and coherence of paragraphs using supplied rubrics.
2.2	Evaluate problems in the structure, organization and	**S1**	Lectures Group discussions Teacher-guided activities Tutorial Hands-on exercise	
2.3	Employ thesis statement parts: topic and controlling idea.	**S1**	Lectures Group discussions Teacher-guided activities Tutorial Hands-on exercise	
3.0	**Values, autonomy, and responsibility**			

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
3.1	Adhere to academic values and ethics	**V1**	Lectures Group discussions Teacher-guided activities	1.Class participation 2.Exams 3. Assignments
3.2	Complete autonomous and collaborative tasks with responsibility.	**V1**	Lectures Group discussions Teacher-guided activities	1.Class participation 2.Exams 3. Assignments

C. Course Content

No	List of Topics	Contact Hours
1.	Paragraph Review: Structure and Organization, Content, Mechanics and Formatting and practice.	3
2.	Short Essay Overview: Structure and Organization, Content, Grammar Review, Mechanics and Formatting and Pre-writing techniques	6
3.	Descriptive Essay (Introduction): Structure and Organization, Content, Grammar Review, Mechanics and Formatting, Pre-writing techniques, Practice and Exchanging peer-feedback	
4.	Descriptive Essay (Body): Structure and Organization, Content, Grammar Review, Mechanics and Formatting, Pre-writing techniques and Practice	**3**
5.	Descriptive Essay (Conclusion): Structure and Organization, Content, Grammar Review and Practice.	**6**
6.	Narrative Essay (Introduction): Structure and Organization, Content, Grammar Review and Practice.	**3**
7.	Narrative Essay (Body): Structure and Organization, Content and Practice	**3**
8.	Narrative Essay (Conclusion): Structure and Organization, Content and Practice.	**3**
9.	Focused essay writing practice and feedback	**12**
10.	Revision	**3**
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Homework/ assignments	throughout	20%
2.	Midterm Exam 1	6	20%
3.	Midterm Exam 2	12	20%
...	Final Exam	16	40%

*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	**Oshima Alice, Hogue Ann. (2006).** ***Writing Academic English*** **(4th Edition). The Longman Academic Writing Series**
Supportive References	
Electronic Materials	**Greetham, B. (2013).** ***How to Write Better Essays: Palgrave Macmillan.***
Other Learning Materials	http://www.eslcafe.com/bookstore/writing.html https://learnenglish.britishcouncil.org/skills/writing https://www.grammarly.com/?q=essay&utm_source=google&utm_m edium=cpc&utm_campaign=11862360209&utm_content=4879 62301 813&utm_term=mla%20style&matchtype=b&placement=&network= g&gclid=CjwKCAjwkvWKBhB4EiwA-GHjFmVyBziLRjBc-M8doRAuASS6fY6UjWBHh8KJLRgFwFiLwt2a_RgDExoCoK4QAvD_BwE&gclsrc=aw.ds https://owl.purdue.edu/ https://www.press.umich.edu/script/press/331840

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Computer lab
Technology equipment (projector, smart board, software)	Classrooms equipped with data shows

Items	Resources
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 enrolled in this course	Questionnaire
Effectiveness of Students assessment	Course instructors and course coordinator complete a course report to provide their evaluation of the course implementation and update the course specification accordingly.	Report
Quality of learning resources	Course instructors and course coordinator complete a course report to provide their evaluation of the course implementation and update the course specification accordingly.	Report
The extent to which CLOs have been achieved	Course instructors and course coordinator complete a course report to provide their evaluation of the course implementation and update the course specification accordingly.	Report
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Council of the Department of Languages and Translation
REFERENCE NO.	
DATE	30\5\2023

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
(Bachelor)

Course Title:	Introduction to Mathematics
Course Code:	Math1101
Program:	General course
Department:	Mathematics
College:	Faculty of Science
Institution:	University of Tabuk
Version:	4
Last Revision Date:	12 September 2023

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (3 Hours/Week)					
2. Course type					
A.	☒ University	☐College	☐Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (First Year/Level 1)					
4. Course general Description:					
The course will focus on elementary concepts of mathematics before a student undertakes advanced study in mathematics. Topics include algebra of the real numbers, algebraic, absolute value in equations and inequalities, complex numbers and elementary functions with an emphasis on their graphical properties and algebraic manipulations. Particular functions treated include linear, quadratic, polynomial, rational, exponential, logarithmic functions and trigonometric functions. The students will also have an idea on right triangles, trigonometric identities, sequences, mathematical Induction, binomial formula and elementary geometry, such as circles and triangles.					
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 goal of this course is to familiarize the students with the graphs, properties, and algebraic manipulations of elementary functions. They will be also able to use the basic concepts of mathematics, especially the basic algebraic operations, trigonometry, complex numbers sequences, mathematical induction and binomial formula and recognize the coordinates systems and their use in simple geometric cases.					

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	Recall the definition of absolute value, elementary functions such as quadratic, trigonometric, exponential, logarithmic and their graphs.	ILO1	Lectures Class Discussions	Quizzes Midterm Exam Final Exam
1.2	Recognize the role of some concepts such as complex numbers	ILO1	Lectures Class Discussions	Quizzes Midterm Exam Final Exam
...				
2.0	**Skills**			
2.1	Apply the basic algebra skills to solve mathematical problems.	ILO1	Lectures Class Discussions Cooperative learning Assign tasks	Quizzes Midterm Exam Final Exam Homeworks
2.2	Solve linear equations and inequalities including absolute value, quadratic, radical, exponential and logarithmic functions	ILO1	Lectures Class Discussions Cooperative learning Assign tasks	Quizzes Midterm Exam Final Exam Homework's

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.3	Manipulate the elementary rules in triangles, and circles, and thus deduce the trigonometric identities easily	ILO1	Lectures Class Discussions Cooperative learning Assign tasks	Quizzes Midterm Exam Final Exam Homework's
2.4	Prove simple statements using mathematical induction	ILO1	Lectures Class Discussions Cooperative learning Assign tasks	Quizzes Midterm Exam Final Exam Homework's
2.5	Apply the knowledge of sequences in a variety of contexts	ILO1	Lectures Class Discussions Cooperative learning Assign tasks	Quizzes Midterm Exam Final Exam Homework's
3.0	**Values, autonomy, and responsibility**			
3.1	Take responsibility to work independently and with other members of the group	ILO8- ILO10	Cooperative learning Assign tasks	Homework's Class participation Essay
3.2	Demonstrate time management in self-study.	ILO9	Cooperative learning Assign tasks	Homework's Class participation Essay

C. Course Content

No	List of Topics	Contact Hours
1.	Basic Algebraic Operations.	3 hrs
2.	Absolute Value in Equations and Inequalities.	3 hrs
3.	Complex Numbers.	3 hrs
4.	Distance in the Plane, Functions	3 hrs
5.	Graphing Functions, Even and Odd Functions.	3 hrs
6.	Quadratic Functions.	3 hrs
6.	**Mid –Exam1 #**	
7.	Operations on Functions.	3 hrs
8.	Inverse Functions.	3 hrs
9.	Exponential and Logarithmic Functions.	3 hrs
10.	Trigonometric Function Properties and Identities.	3 hrs

11.	Right Triangles.	3 hrs
11.	**Mid –Exam2 #**	
12.	Sequences.	3 hrs
13.	Mathematical Induction.	3 hrs
14.	Arithmetic and Geometric Sequences.	3 hrs
15.	Binomial Formula.	3 hrs
16-18	**Revision& Final -Exam**	
Total		**14** hrs

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Activities	Weekly basis	5%
2.	Homework	Weekly basis	5%
3.	Quizzes	Weekly basis	10%
4.	Mid Exam	6th week	20%
5.	Mid Exam	11th week	20%
6.	Final Exam	At end of the Semester	40%

*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	Precalculus: A custom publication by McGraw Hill, By Barnett, Ziegler, Byleen, Sobecki, 2011.
Supportive References	1.Courant, Richard, and Fritz John. Introduction to calculus and analysis I. Springer Science & Business Media, 2012 2.Elements of Mathematical Logic and Set Theory Hardcover – Import, January 1, 1967, by L. Slupecki, J.; Borkowski (Author)
Electronic Materials	Saudi electronic library
Other Learning Materials	All materials requested by the staff members during the lectures

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture Room with maximum capacity of 30 students and equipped with White Board

Items	Resources
Technology equipment (projector, smart board, software)	Data show, Smart board and internet connection.
Other equipment (depending on the nature of the specialty)	--

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Direct/Indirect
	Department/Faculty	Direct/Indirect
	External committees	Indirect
Effectiveness of Students assessment	Students	Direct/Indirect
	Department/Faculty	Direct/Indirect
	External committees	Indirect
Quality of learning resources	Students	Direct/Indirect
	Department/Faculty	Direct/Indirect
	External committees	Indirect
The extent to which CLOs have been achieved	Students	Direct/Indirect
	Department/Faculty	Direct/Indirect
	External committees	Indirect
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Study plans and programs committee
REFERENCE NO.	
DATE	12/09/2023

2023
TP-153

Course Specification
(Bachelor)

Course Title:	Differential Calculus
Course Code:	MATH1102
Program:	General Course
Department:	Mathematics
College:	Faculty of Science
Institution:	University of Tabuk
Version:	4
Last Revision Date:	12 September 2023

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (3 Hours/Week)					
2. Course type					
A.	☒ University	☐College	☐Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (level-2/ First Year)					
4. Course general Description:					
This course covers topics of calculus of single variable functions including limits and continuity, derivatives and antiderivative. Students will use these tools to solve application problems in a variety of settings ranging from physics and biology to business and economics, taking into account student's majors. Use program packages such as Mathematica, MATLAB or Maple in some scheduled topics if possible					
5. Pre-requirements for this course (if any):					
MATH1101					
6. Co-requisites for this course (if any):					
NA					
7. Course Main Objective(s):					
Upon successful completion of this course, students will be able to: • **Compute limits, derivatives, and antiderivative.** • **Analyze functions using limits, derivative, and anti-derivative.** • **Recognize the appropriate tools of calculus to provide and solve applied problems.** **A Mathematical software tool to implement that graphs functions and performs many standard calculus operations**					

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	Define the different types of functions, properties and forms and use it to express some natural phenomena	ILO 1	• Traditional lectures. • Group discussions. • Cooperative learning. • Self-learning through the website. .	• Exams. • Activities Class. • Quizzes. • Assignments .
1.2	Recognize the basic concepts of limits, continuity, differentiation and anti-differentiation, and the relationship between them	ILO 1		
1.3	Recognize the basic rules and theories of differentiation	ILO 1		
1.4	Define calculus concepts and techniques to provide mathematical models of real-world situations	ILO 1 + 5		
2.0	**Skills**			
2.1	Determine continuity at a point or on intervals and distinguish between	ILO 1	• Traditional lectures. • Group discussions.	• Exams. • Assignments . • Quizzes.

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	the types of discontinuities at a point		• Cooperative learning. • Self-learning through the website.	
2.2	Compute limits, derivatives, antiderivatives for a various types of functions	ILO 1		
2.3	Analyze functions and their graphs as informed by limits and derivatives	ILO 1		
2.4	Use differentiation to solve real world problems such as rate of change and optimization	ILO 1 + 3		
3.0	**Values, autonomy, and responsibility**			
3.1	Realize the importance of the computational principles of calculus to the solutions of various mathematical problems.	ILO 5	• Group discussions. • Cooperative learning. • Projects.	• Assignments . • Class Activities. Oral exams.
3.2	Present mathematics clearly and precisely to an audience of peers and faculty.	ILO 3		

C. Course Content

No	List of Topics	Contact Hours
1.	The Limits of a Function.	3 hrs
2.	Calculating Limits Using the Limits Laws .	3 hrs
3.	Continuity, Limits at Infinity.	3 hrs
4.	Derivatives as a Function.	3 hrs
5.	Derivatives of Polynomials and Exponential Functions.	3 hrs
6.	The Product and Quotient Rules.	3 hrs
6.	**Mid-Exam1#**	
7.	Derivatives of Trigonometric Functions.	3 hrs

8.	The Chain Rule, Implicit Differentiation.	3 hrs
9.	Derivatives of Logarithmic and Inverse Trigonometric Functions	3 hrs
10.	Higher Derivatives , L'H'opital Rule .	3 hrs
11.	Maximum and Minimum Values.	3 hrs
11.	**Mid-Exam2#**	
12.	Mean Value Theorem ,The Derivative Test.	3 hrs
13.	Indeterminate Forms and Optimization Problems.	3 hrs
14.	Anti-derivatives.	3 hrs
15.	Anti-derivatives.	3 hrs
16-18	**Revision & Final-Exam**	
Total		**45** hrs

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Activities	Weekly basis	5%
2.	Homework	Weekly basis	5%
3.	Quizzes	Weekly basis	10%
4.	Mid Exam	6th week	20%
5.	Mid Exam	11th week	20%
6.	Final Exam	At end of the Semester	40%

*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	Calculus Early Transcendentals, by James Stewart Published by Brooks Cole 9th Edition 2019
Supportive References	• Calculus Early Transcendentals, by H. Anton, I. Bivens and S. Davis Published by WILEY 10th Edition 2012 • Thomas' Calculus, by Joel R. Hass, Christopher E. Heil Maurice D. Weir, 14th edition 2018
Electronic Materials	موقع د. جيمس ستيوارت (موقع مساند للمرجع الرئيسي) https://stewartcalculus.com/ موقع البروفيسور ليونارد لتعليم الرياضيات https://www.patreon.com/ProfessorLeonard دورات معهد ماساتشوستس للتكنولوجيا المفتوحة

	https://ocw.mit.edu/courses/mathematics/18-01sc-single-variable-calculus-fall-2010/ المكتبة الرقمية السعودية https://www.sdl.edu.sa/
Other Learning Materials	--

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	- Lecture room with capacity of 30 students and equipped with and internet connection. - Library
Technology equipment (projector, smart board, software)	- White board - Smart board - Data Show - Sound system - Computer lab equipped with supporting software
Other equipment (depending on the nature of the specialty)	Mathematical software

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Direct/Indirect
	Department/Faculty	Direct/Indirect
	External committees	Indirect
Effectiveness of Students assessment	Students	Direct/Indirect
	Department/Faculty	Direct/Indirect
	External committees	Indirect
Quality of learning resources	Students	Direct/Indirect
	Department/Faculty	Direct/Indirect
	External committees	Indirect
The extent to which CLOs have been achieved	Students	Direct/Indirect
	Department/Faculty	Direct/Indirect
	External committees	Indirect
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Study plans and programs committee

REFERENCE NO.	
DATE	12/9/2023

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023

TP-153

Course Specification

(Bachelor)

Course Title:	Linear Algebra
Course Code:	MATH1205
Program:	Bachelor of Science in Mathematics
Department:	Mathematics
College:	Faculty of Science
Institution:	University of Tabuk
Version:	4
Last Revision Date:	08 September 2023

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (03 Hours/Week)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required			☐Elective	
3. Level/year at which this course is offered: (Level 4/ Year 2)					
4. Course general Description:					
The course is designed to study systems of linear equations, matrices, vector spaces, subspaces, bases and dimensions, inner product spaces, Eigen values, Eigenvectors Eigen spaces, and linear transformations.					
5. Pre-requirements for this course (if any):					
MATH1102					
6. Co-requisites for this course (if any):					
None					
7. Course Main Objective(s):					
The main objective of this course is to provide students with a comprehensive applied understanding of the common advantage of the technical method in the field of mathematics related to linear algebra.					

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	Recall the concepts of linear algebra.	K1	Introducing new ideas through case study Lectures Class Discussions	- Quizzes -Assignments -Midterm exams - Final exam
1.2	Demonstrate knowledge of process and techniques of linear algebra in different fields.	K2		
2.0	**Skills**			
2.1	Use analytical methods solve systems of linear equations by different methods.	S1	Lectures Class Discussions	- Quizzes -Assignments -Midterm exams - Final exam
2.2	Prove theorems of linear algebra.	S2		
2.3	Apply basic knowledge of linear algebra in solving mathematical problems.	S3		
3.0	**Values, autonomy, and responsibility**			
3.1	Take responsibility self-development and manage duties and time.	V2	- Lectures -Assign tasks	- Quizzes -Assignments

C. Course Content

No	List of Topics	Contact Hours
1.	Systems of linear equations and Matrices, Gaussian elimination method, Gauss-Jordan elimination method	3 Hrs
2.	Homogeneous system of linear equations	3 Hrs
3.	Operations on matrices, Properties of matrix operations	3 Hrs
4.	Elementary matrices and method of finding the inverse of matrix	3 Hrs
5.	Further result on system of equations and inevitability	3 Hrs
6.	Determinants, Evaluating determinant by row reduction, Properties of determinant function	3 Hrs
6.	**Mid-Exam 1 #**	
7.	Properties of determinant function	3 Hrs
8.	Cofactor expansions, Cramer's rule	3 Hrs
9.	Vector Spaces: Subspaces, Linear combinations, Linear dependence and linear independence	3 Hrs
10.	Basis and dimension	3 Hrs
11.	Row and column space of matrix	3 Hrs
11.	**Mid-Exam 2 #**	
12.	Inner product space, Length and angle in inner product spaces	3 Hrs
13.	Linear transformations, Property of linear transformations, Kernel and range of linear transformation	3 Hrs
14.	Eigenvalues and Eigenvectors - Introduction to eigenvalues, eigenvectors and eigen spaces	3 Hrs
15.	Diagonalization	3 Hrs
16-18	**Revision & Final Exam**	
Total		**45 hrs**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Activities	Weekly basis	5%
2.	Homework	Weekly basis	5%
3.	Quizzes	Weekly basis	10%

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
4.	Mid Exam1	6th week	20%
5.	Mid Exam2	11th week	20%
6.	Final Exam	At end of the Semester	40%

*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	Jorg Liesen and Volker Mehrmann, Linear Algebra, First German Edition, Springer Undergraduate Mathematics Series, Springer International Publishing Switzerland, 2015.
Supportive References	Mac Gregor, P. "Applied linear algebra and matrix analysis (2nd edn.), Springer Verlag, 2018. R. Larson, and B.Edwards Elementary Linear Algebra, 5th Edition. D.H. Heath and Company, 2004.
Electronic Materials	Saudi electronic library https://www.sdl.edu.sa/
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	-Lecture Room with capacity of 30 students and equipped with White Board, Overhead projector and internet connection. -Library
Technology equipment (projector, smart board, software)	Projectors
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	Direct/Indirect
	Department/Faculty	Direct/Indirect
	External committees	Indirect
Effectiveness of	Students	Direct/Indirect

Assessment Areas/Issues	Assessor	Assessment Methods
Students assessment	Department/Faculty	Direct/Indirect
	External committees	Indirect
Quality of learning resources	Students	Direct/Indirect
	Department/Faculty	Direct/Indirect
	External committees	Indirect
The extent to which CLOs have been achieved	Students	Direct/Indirect
	Department/Faculty	Direct/Indirect
	External committees	Indirect
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Approval by the Department Council
REFERENCE NO.	Department Council No (7)
DATE	14/09/2023

Course Specification

(Bachelor)

Course Title:	Differential Equations
Course Code:	MATH1215
Program:	Bachelor of Science in Mathematics
Department:	Mathematics
College:	Faculty of Science
Institution:	University of Tabuk
Version:	4
Last Revision Date:	07 September 2023

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (03 Hours/Week)

2. Course type

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

3. Level/year at which this course is offered: (Level 4 /Year 2)

4. Course general Description:

- **The course is designed to study Introduction to differential equations and solutions of differential equations.**
- **Classification of Differential Equations**
- **Method for solving first-Order Differential Equations (Linear equations, Separable equations, Exact equations, Homogeneous equations and Applications).**
- **Second- and Higher-Order Equations**
- **Homogeneous equations with constant coefficients, Fundamental solutions, Linear independence and Wronskian, Complex roots, Repeated roots, Method of Undetermined coefficients and Variation of parameters**
- **Nonhomogeneous Second-Order Linear Equations with Constant Coefficients**

Higher-Order Linear Equations with Constant Coefficients, Systems of Linear Differential Equations (Solution of systems of linear equations, Linear independence, eigenvalues and eigenvectors. Fourier Series.

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

MATH1102

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

None

7. Course Main Objective(s):

- **To know Student the importance of the differential equations in Physics, Chemistry and Engineering Science.**
- **To allow the students acquires knowledge by learning new theories, concepts, and methods of solution in differential equations.**
- **To study Student the linear differential equations of the first order with some applications.**
- **To learn Student studies the differential equations of higher order and methods of solution.**
- **To acquire Student cognitive skills through thinking and problem solving.**

To make Student responsible for their own learning through solutions of assignments and time management.

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	Recall knowledge of the concepts of differential equations	K1	Introducing new ideas through case study Lectures Class Discussions	Quizzes Midterm Exams Final Exams homework assignments.
1.2	Describe techniques, and processes used in differential equations in practical problems.	K2		
2.0	**Skills**			
2.1	Solve the mathematical problems using Fourier Legendre and Fourier Bessel Series.	S1	Lectures Class Discussions Class presentation	Quizzes Midterm Exams Final Exams Homework
2.2	Apply methods and	S3		

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	techniques to solve practical problems.			assignments.
2.3	Communicate with Peers and Lectures	S4		
3.0	**Values, autonomy, and responsibility**			
3.1	Work effectively in groups.	V1	Lectures Class Discussions Group work	Quizzes Homework assignments.
3.2	Demonstrate responsibility to submit assignments on time.	V2		

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to DEs and solutions of differential equations.	3 Hrs
2.	Classification of Differential Equations.	3 Hrs
3.	Method for solving first-Order Differential Equations.	3 Hrs
4.	Separable Exact Equations.	3 Hrs
5.	Method for solving first-Order Differential Equations.	3 Hrs
6.	Linear, Bernoulli Equations.	3 Hrs
6.	**Mid-Exam1**	
7.	Second- and Higher-Order Equations.	3 Hrs
8.	Homogeneous Linear equations with constant coefficients.	6 Hrs
9.	Undetermined coefficients	3 Hrs
10.	superposition approach.	3 Hrs
11.	Variation of parameters.	3 Hrs
11.	**Mid-Exam2**	
12	Cauchy-Euler Equation, Systems of Linear Equations	3 Hrs
13	Systems of Linear First-order Differential Equations.	3 Hrs
14	Distinct real and repeated eigenvalues.	3 Hrs
15	Orthogonal Functions ,Fourier Series, Fourier Cosine and Sine Series.	3 Hrs
16-18	**Revision & Final Exam**	
Total		**45 Hrs**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Activities	Weekly basis	5%
2.	Homework	Weekly basis	5%
3.	Quizzes	Weekly basis	10%
4.	Mid Exam1	6^{th} week	20%
5.	Mid Exam2	11^{th} week	20%
6.	Final Exam	At end of the Semester	40%

*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	John Wiley & Sons and Shepley L. Ross ,Differential Equations:3rd. Edit. (1998).
Supportive References	Allan Struthers, Merle Potter, Differential Equations for Scientists and Engineers, Springer, 2019 Adkins, William A., and Mark G. Davidson. "Linear Constant Coefficient Differential Equations." Ordinary Differential Equations. Springer, New York, NY, 2012. 275-329.
Electronic Materials	Saudi electronic library https://www.sdl.edu.sa/
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	1.Lecture Room with max capacity of 30 students and equipped with White Board, Overhead projector and internet connection. 2.Library
Technology equipment (projector, smart board, software)	Projectors
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	Direct/Indirect
	Department/Faculty	Direct/Indirect
	External committees	Indirect
Effectiveness of Students assessment	Students	Direct/Indirect
	Department/Faculty	Direct/Indirect
	External committees	Indirect
Quality of learning resources	Students	Direct/Indirect
	Department/Faculty	Direct/Indirect
	External committees	Indirect
The extent to which CLOs have been achieved	Students	Direct/Indirect
	Department/Faculty	Direct/Indirect
	External committees	Indirect
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Approval by the Department Council**
REFERENCE NO.	DEPARTMENT COUNCIL NO (7)
DATE	**14/09/2023**

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
(Bachelor)

Course Title:	Multivariate Calculus
Course Code:	MATH1216
Program:	Bachelor of Science in Mathematics
Department:	Mathematics
College:	Faculty of Science
Institution:	University of Tabuk
Version:	4
Last Revision Date:	3 September 2023

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours:					
3 Credit hours (3 Theoretical)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required			☐Elective	
3. Level/year at which this course is offered: (Level 4 \ Year 2)					
4. Course general Description:					
This course is designed to help students develop calculus skills, where the course help students to Introduction to multivariable calculus, double and triple integrals, applications to fluid mechanics. The course also introduce students to hydrostatic force, pipe flow, drag, applications to thermodynamics and the relationships of these physical ideas to the vector calculus theorems of Gauss and Stokes).					
5. Pre-requirements for this course (if any)**:**					
MATH1102 , MATH1271					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
- Recall basic rules and Calculus gives a thorough and rigorous treatment of differential and integral calculus of functions of several variables. **- Apply differentiation and integration methods to solve geometrical and physical problems .** **- Analyze the infinite series, vector fields, Green's theorem, Stokes' theorem, Gauss and the Divergence theorem.** **- Solve partial differentiation, double and triple integrals, applications to fluid mechanics.**					

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	Recall concepts and theorem of advanced calculus	K1	Introducing new ideas through case study Lectures Class Discussions	Quizzes Midterm Exams Final Exams homework assignments.
1.2	Describe techniques, and processes used for solving multivariable Calculus.	K2		
2.0	**Skills**			
2.1	Solve problems involving Gradients and Directional Derivatives, Double Integral, Triple Integrals, Line integral.	S1	-Lectures -Class Discussions	-Quizzes - Midterm Exams -Final Exams -Homework assignments.
2.2	Demonstrate theorems of partial differentiation and calculus of functions of several variables.	S2		
2.3	Apply theories and concepts to solve problems of fluid mechanics and thermodynamics.	S3		
3.0	**Values, autonomy, and responsibility**			
3.1	Commit to ethical and	V1	-Lectures	-Quizzes

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	academic values while performing tasks.		-Assign tasks	-Homework assignments.
3.2	Demonstrate responsibility to submit assignments on time.	V2		

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to multivariable calculus.	3 Hrs
2.	Curves of the Plane. partial differentiation.	3 Hrs
3.	Introduction to Partial Differential Equations.	3 Hrs
4.	Methods of solution to Partial Differential Equations.	3 Hrs
5.	Double and Triple integrals.	3 Hrs
6.	line and surface integrals.	3 Hrs
6.	**Mid-Exam 1 #**	
7.	infinite series, vector fields.	3 Hrs
8.	Green's theorem, Stokes' theorem.	3 Hrs
9.	Gauss and the Divergence theorem.	3 Hrs
10.	Engineering programs (EE, ME, CE, IE).	3 Hrs
11.	Applications of Program (Examples in ME Program).	3 Hrs
11.	**Mid-Exam 2 #**	
12.	Applications to fluid mechanics: buoyancy, hydrostatic force, pipe flow, drag.	3 Hrs
13.	applications to thermodynamics: work, entropy, heat transfer; numerical methods).	3 Hrs
14.	Examples in EE Program: gravitational, electric, and magnetic fields, Maxwell's laws.	3 Hrs
15.	Vector calculus theorems of Gauss and Stokes.	3 Hrs
16-18	**Revision & Final Exam**	
Total		**45 hrs**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Activities	Weekly basis	5%
2.	Homework	Weekly basis	5%
3.	Quizzes	Weekly basis	10%
4.	Mid Exam1	6th week	20%
5.	Mid Exam2	11th week	20%
6.	Final Exam	At end of the Semester	40%

*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	JAMES STEWART, MULTIVARIABLE CALCULUS, SEVENTH EDITION, McMASTER UNIVERSITY AND UNIVERSITY OF TORONTO, 2012. http://www.uop.edu.pk/ocontents/Multivariable%20Calculus%207th%20Edition%20By%20James%20Stewart.pdf
Supportive References	I. Bivins, S. Davis Howard Anton, Calculus, Early Transcendentals ,10th ed ; 1981. Courant, Richard, and Fritz John. Introduction to calculus and analysis I. Springer Science & Business Media, 2012.
Electronic Materials	Saudi electronic library https://www.sdl.edu.sa/
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	1.Lecture Room with capacity of 30 students and equipped with White Board, Overhead projector and internet connection. 2.Library
Technology equipment (projector, smart board, software)	Projectors
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	Direct/Indirect
	Department/Faculty	Direct/Indirect
	External committees	Indirect
Effectiveness of Students assessment	Students	Direct/Indirect
	Department/Faculty	Direct/Indirect
	External committees	Indirect
Quality of learning resources	Students	Direct/Indirect
	Department/Faculty	Direct/Indirect
	External committees	Indirect
The extent to which CLOs have been achieved	Students	Direct/Indirect
	Department/Faculty	Direct/Indirect
	External committees	Indirect
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Approval by the Department Council**
REFERENCE NO.	DEPARTMENT COUNCIL NO (7)
DATE	**14/09/2023**

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023

TP-153

Course Specification

(Bachelor)

Course Title:	Multivariate Calculus
Course Code:	MATH1216
Program:	Bachelor of Science in Mathematics
Department:	Mathematics
College:	Faculty of Science
Institution:	University of Tabuk
Version:	4
Last Revision Date:	3 September 2023

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours:					
3 Credit hours (3 Theoretical)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (Level 4 \ Year 2)					
4. Course general Description:					
This course is designed to help students develop calculus skills, where the course help students to Introduction to multivariable calculus, double and triple integrals, applications to fluid mechanics. The course also introduce students to hydrostatic force, pipe flow, drag, applications to thermodynamics and the relationships of these physical ideas to the vector calculus theorems of Gauss and Stokes).					
5. Pre-requirements for this course (if any)**:**					
MATH1102 , MATH1271					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
- Recall basic rules and Calculus gives a thorough and rigorous treatment of differential and integral calculus of functions of several variables. **- Apply differentiation and integration methods to solve geometrical and physical problems .** **- Analyze the infinite series, vector fields, Green's theorem, Stokes' theorem, Gauss and the Divergence theorem.** **- Solve partial differentiation, double and triple integrals, applications to fluid mechanics.**					

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	Recall concepts and theorem of advanced calculus	K1	Introducing new ideas through case study Lectures Class Discussions	Quizzes Midterm Exams Final Exams homework assignments.
1.2	Describe techniques, and processes used for solving multivariable Calculus.	K2		
2.0	**Skills**			
2.1	Solve problems involving Gradients and Directional Derivatives, Double Integral, Triple Integrals, Line integral.	S1	-Lectures -Class Discussions	-Quizzes - Midterm Exams -Final Exams -Homework assignments.
2.2	Demonstrate theorems of partial differentiation and calculus of functions of several variables.	S2		
2.3	Apply theories and concepts to solve problems of fluid mechanics and thermodynamics.	S3		
3.0	**Values, autonomy, and responsibility**			
3.1	Commit to ethical and	V1	-Lectures	-Quizzes

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	academic values while performing tasks.		-Assign tasks	-Homework assignments.
3.2	Demonstrate responsibility to submit assignments on time.	V2		

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to multivariable calculus.	3 Hrs
2.	Curves of the Plane. partial differentiation.	3 Hrs
3.	Introduction to Partial Differential Equations.	3 Hrs
4.	Methods of solution to Partial Differential Equations.	3 Hrs
5.	Double and Triple integrals.	3 Hrs
6.	line and surface integrals.	3 Hrs
6.	**Mid-Exam 1 #**	
7.	infinite series, vector fields.	3 Hrs
8.	Green's theorem, Stokes' theorem.	3 Hrs
9.	Gauss and the Divergence theorem.	3 Hrs
10.	Engineering programs (EE, ME, CE, IE).	3 Hrs
11.	Applications of Program (Examples in ME Program).	3 Hrs
11.	**Mid-Exam 2 #**	
12.	Applications to fluid mechanics: buoyancy, hydrostatic force, pipe flow, drag.	3 Hrs
13.	applications to thermodynamics: work, entropy, heat transfer; numerical methods).	3 Hrs
14.	Examples in EE Program: gravitational, electric, and magnetic fields, Maxwell's laws.	3 Hrs
15.	Vector calculus theorems of Gauss and Stokes.	3 Hrs
16-18	**Revision & Final Exam**	
Total		**45 hrs**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Activities	Weekly basis	5%
2.	Homework	Weekly basis	5%
3.	Quizzes	Weekly basis	10%
4.	Mid Exam1	6th week	20%
5.	Mid Exam2	11th week	20%
6.	Final Exam	At end of the Semester	40%

*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	JAMES STEWART, MULTIVARIABLE CALCULUS, SEVENTH EDITION, McMASTER UNIVERSITY AND UNIVERSITY OF TORONTO, 2012. http://www.uop.edu.pk/ocontents/Multivariable%20Calculus%207th%20Edition%20By%20James%20Stewart.pdf
Supportive References	I. Bivins, S. Davis Howard Anton, Calculus, Early Transcendentals ,10th ed ; 1981. Courant, Richard, and Fritz John. Introduction to calculus and analysis I. Springer Science & Business Media, 2012.
Electronic Materials	Saudi electronic library https://www.sdl.edu.sa/
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	1.Lecture Room with capacity of 30 students and equipped with White Board, Overhead projector and internet connection. 2.Library
Technology equipment (projector, smart board, software)	Projectors
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	Direct/Indirect
	Department/Faculty	Direct/Indirect
	External committees	Indirect
Effectiveness of Students assessment	Students	Direct/Indirect
	Department/Faculty	Direct/Indirect
	External committees	Indirect
Quality of learning resources	Students	Direct/Indirect
	Department/Faculty	Direct/Indirect
	External committees	Indirect
The extent to which CLOs have been achieved	Students	Direct/Indirect
	Department/Faculty	Direct/Indirect
	External committees	Indirect
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Approval by the Department Council
REFERENCE NO.	Department Council No (7)
DATE	14/09/2023

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
— (Bachelor)

Course Title: Engineering Mathematics	
Course Code: MATH1271	
Program: Bachelor of Science in Mathematics	
Department: Mathematics	
College: Faculty of Science	
Institution: University of Tabuk	
Version: 4	
Last Revision Date: 3 September 2023	

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours:					
3 Credit hours (3 Theoretical)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required			☐Elective	
3. Level/year at which this course is offered: (Level 4 \ Year 2)					
4. Course general Description:					
This course is designed to help students develop calculus skills, where the course help students to master the basic methods of integration and their applications. The course also introduce students to sequences and Infinite Series and their convergence.					
5. Pre-requirements for this course (if any)**:**					
MATH1102					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
- Recall basic rules and theorems of integral calculus. **- Apply integration methods to solve geometrical and physical problems .** **- Analyze the convergence of infinite series.**					

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	Recall concepts of integration.	K1	Introducing new ideas through case study Lectures Class Discussions	Quizzes Midterm Exam Final Exam homework assignments
1.2	Describe methods of integration in practical problems.	K2		
2.0	**Skills**			
2.1	Solve the analytical procedures to solve problems of integration.	S1	Lectures Class Discussions	Quizzes Midterm Exam Final Exam Homework assignments.
2.2	Demonstrate integration of functions and their graphs.	S2		
2.3	Apply the fundamental theorem.	S3		
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate responsibility to solve given assignments on their own and submit the solution on time.	V2	Lectures Assign tasks	Quizzes Homework assignments

C. Course Content

No	List of Topics	Contact Hours
1.	Indefinite integrals, Integration by substitution.	3 Hrs
2.	Definite integral, The fundamental Theorem of calculus.	3 Hrs
3.	Definite integral by Substitution	3 Hrs
4.	Hyperbolic Functions.	3 Hrs
5.	Area Between Two Curves, Volumes By Slicing .	3 Hrs
6.	Disks And Washers, Length of a plane Curve.	3 Hrs
6.	**Mid-Exam 1 #**	
7.	Area of a Surface of Revolution.	3 Hrs
8.	Integration by parts, Trigonometric Integrals.	3 Hrs
9.	Improper Integrals.	3 Hrs
10.	Sequences , Monotone Sequences.	3 Hrs
11.	Infinite Series, Convergence Tests.	3 Hrs
11.	**Mid-Exam 2 #**	
12.	The Comparison ,Ratio, and Root tests.	3 Hrs
13.	Alternating Series; Conditional convergence	3 Hrs
14.	Maclurin and Taylor polynomials Maclurin	3 Hrs
15.	Maclurin and Taylor Series; Power Series.	3 Hrs
16-18	**Revision & Final Exam**	
Total		**45 hrs**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Activities	Weekly basis	5%
2.	Homework	Weekly basis	5%
3.	Quizzes	Weekly basis	10%
4.	Mid Exam1	6^{th} week	20%
5.	Mid Exam2	11^{th} week	20%
6.	Final Exam	At end of the Semester	40%

*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. Bivins, S. Davis Howard Anton, Calculus, Early Transcendentals ,10**th ed **; 1981.**
Supportive References	Courant, Richard, and Fritz John. Introduction to calculus and analysis I. Springer Science & Business Media, 2012.
Electronic Materials	Saudi electronic library https://www.sdl.edu.sa/
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	1.Lecture Room with capacity of 30 students and equipped with White Board, Overhead projector and internet connection. 2.Library
Technology equipment (projector, smart board, software)	Projectors
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	Direct/Indirect
	Department/Faculty	Direct/Indirect
	External committees	Indirect
Effectiveness of Students assessment	Students	Direct/Indirect
	Department/Faculty	Direct/Indirect
	External committees	Indirect
Quality of learning resources	Students	Direct/Indirect
	Department/Faculty	Direct/Indirect
	External committees	Indirect
The extent to which CLOs have been achieved	Students	Direct/Indirect
	Department/Faculty	Direct/Indirect
	External committees	Indirect
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Approval by the Department Council
REFERENCE NO.	Department Council No (7)
DATE	14/09/2023

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
(Bachelor)

Course Title:	**Fundamentals of Physics**
Course Code:	**PHYS1101**
Program:	Bachelor of Science in Physics
Department:	**Physics**
College:	**Science**
Institution:	**University of Tabuk**
Version:	**TP-153**
Last Revision Date:	2023

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (2 +1)

2. Course type

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

3. Level/year at which this course is offered: (1st year/ 1st level)

4. Course general Description:

Theoretical:
This course covers a general introduction to the basic concepts and skills that students must master such as the international system of units (SI), significant numbers, vectors, kinematics and dynamics, including Newton's laws and their applications. Mechanics concepts such as work, kinetic and potential energies, momentum, rotational dynamics, and vibrational motion are also introduced. An introduction to fluid dynamics and thermodynamics is also taught. This course will prepare students for all university majors

Laboratory:
Experiments on basic physics concepts that includes kinematics and Newton’s laws.

5. Pre-requirements for this course (if any)**: None**

6. Pre-requirements for this course (if any)**: None**

7. Course Main Objective(s): The course aims to develop the student’s ability to understand and apply a number of issues based on basic mechanical principles, rotational and fluid dynamics, vibrational dynamics, and heat, and provide the student with the ability to explain some environmental phenomena related to movement and its applications and build the basis for understanding subsequent courses.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	2	67%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		
5	Other (Laboratory)	2	33%

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	Explain basic laws and principles of physics theorems.	**K1**	Lecture/e-lecture Discussion Problem-Solving	Exams Assignments Participation

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.2	Recognize the impact of basic physics laws on our lives.	**K2**	Laboratory	Lap Report
...				
2.0	**Skills**			
2.1	Calculate the solution of basic physics problems.	**S1**	Lecture/e-lecture Discussion Problem-Solving Laboratory	Exams Assignments Participation Lap Report
2.2	Organize the experiments in the fundamental physics field and related reports.	**S3**		
...				
3.0	**Values, autonomy, and responsibility**			
3.1	Perform fundamental physics experiments within teams effectively	**V1**	Lecture/e-lecture Discussion Problem-Solving Laboratory	Exams Assignments Participation Lap Report
3.2	Demonstrate integrity and basic academic values	**V2**		

C. Course Content

No	List of Topics	Contact Hours
1.	Measurements (SI Units system - Significant Numbers- changing units)	**2**
2.	Vectors - Coordinate Systems	**2**
3.	Motion along a straight line (displacement - velocity - acceleration - free fall)	**2**
4.	Motion in two and three dimensions (speed - acceleration - projectile motion)	**2**
5.	Forces, Newton's laws Newton's laws-applications	**2**
6.	Kinetic energy - work – power Potential energy - the principle of conservation of energy	**2**
7.	Momentum – Collision (elastic and inelastic)	**2**
8.	Rotational motion (displacement - amplitude - acceleration - equations of motion	**2**
9.	Torque - calculating the moment of inertia	**2**
10.	Fluids (density and pressure	**2**
11.	Pascal's principle - Archimedes' principle	**2**
12.	Surface tension - viscosity - continuity equation - Bernoulli equation	**2**

13.	Heat (temperature and its measurement - thermometers - zeros' law of thermodynamics	**2**
14.	Quantity of heat and specific heat - expansion of bodies	**2**
15.	heat transfer - ideal gas - Newton's law of cooling	
Total		**30**

No	List of experiments
1	**Fine Measurements**
2	**Hooke's Law**
3	**The Simple Pendulum**
4	**Static Friction**
5	**Free Fall motion**
6	**The Force Table**
7	**Angled Projection**
8	**Newton's second Law**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Final Exam	17	40%
2.	Assignment/Participation	1-17	5%
3.	Quiz	1-17	10%
4.	Midterm Exam	7	20%
5.	Lab Exam	15	25%

*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. Fundamentals of Physics-12th Edition –Jearl Walker (2021) 2. An introduction to Physical Science 15th Edition (2020) - Shipman-Wilson-Higgins-Torres
Supportive References	1. Physics for Global Scientists and Engineers – Volume 1–2ND Edition 2017- Serway- Jewett- Wilson – Rowlands 2. Fundamental of Physics, by Halliday & Resnick, 11th edition (2018), John Wiley & Sons

Electronic Materials	http://hdl.handle.net/2237/24065
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms equipped with modern display equipment
Technology equipment (projector, smart board, software)	Electronic Platform - Multipurpose Data Displays
Other equipment (depending on the nature of the specialty)	Well-equipped laboratories to conduct experimental work

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students, graduates, alumni, faculty, program leaders	Indirect
Effectiveness of Students' assessment	Faculty, Faculty subcommittees	Direct
Quality of learning resources	Faculty, program leaders	Indirect
The extent to which CLOs have been achieved	faculty, Dean office, Faculty subcommittees, Peer Reviewer	Direct
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
(Bachelor)

Course Title:	General Physics
Course Code:	PHYS1271
Program:	Bachelor of Science in Physics
Department:	Physics
College:	Faculty of Sciences
Institution:	University of Tabuk
Version:	*Course Specification Version Number*
Last Revision Date:	*Pick Revision Date.*

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (3+1)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required			☐ Elective	
3. Level/year at which this course is offered: (Level 3/2nd year)					
4. Course general Description:					

The course has been designed to explain the basic principles of electricity. The student realizes, at the beginning, the meaning of the electric charges and their reaction with each other as well as their effect on the surrounding space throughout their electric field. After that, the electric potential, due to the electric field, and the electric stored energy in the capacitors are introduced to connect the topic of electricity with other topics in physics. Furthermore, the concept of the direct current and the electric energy consumption are introduced; accordingly, the student will be able to understand how to calculate the cost of the electricity bill. Therefore, the students connect the concepts with the reality.
Laboratory:
Set of electrical experiments that connect theoretical concepts to practical examples: Resistor Color Code, Ohm's Law, and Resistances in series and in parallel, Resistivity, Wheatstone Bridge and Resistivity of Metals, Potentiometer & Applications, Kirchhoff's Rules, The R-C Circuit.

.

5. Pre-requirements for this course (if any)**: PHYS 1101**

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

7. Course Main Objective(s):

The course enables the students to understand the principles of electricity.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	3	75 %
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**	30
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		75

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 basic laws and principles governing charges and electricity.	K1	Lecture/e-lecture Discussion Problem-Solving Laboratory	Exams Assignments Participation Lap Report
1.2	Recognize the impact of electrical charges on our lives and in technological advancements.	K2	Lecture/e-lecture Discussion Problem-Solving Laboratory	Exams Assignments Participation Lap Report
...				
2.0	**Skills**			

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.1	Calculate the solution of charges and electricity problems.	S1	Lecture/e-lecture Discussion Problem-Solving Laboratory	Exams Assignments Participation Lap Report
2.2	Organize the experiments in the electrical charges field and related reports	S3	Lecture/e-lecture Discussion Problem-Solving Laboratory	Exams Assignments Participation Lap Report
...				
3.0	**Values, autonomy, and responsibility**			
3.1	Perform electrical and charges experiments within teams effectively	V1	Lecture/e-lecture Discussion Problem-Solving Laboratory	Exams Assignments Participation Lap Report
3.2	Demonstrate integrity and basic academic values	V2	Lecture/e-lecture Discussion Problem-Solving Laboratory	Exams Assignments Participation Lap Report
...				

C. Course Content

No	List of Topics	Contact Hours
1.	Static electricity, properties of charges.	5
2.	Electric Charges: Coulomb's law.	5
3.	Electric Field: Definition, unit, electrical field due to a point charge, dipole, electric field of a dipole.	5
4.	Gauss Law: Electric flux, closed surface, solving problems.	4
5.	Electric Potential: Electric potential energy, units, equipotential surfaces.	4
6.	Potential due to a point charge, potential due to a group of point charges.	4
7.	Electric Potential: potential due to an electric dipole.	5
8.	Potential due to a continuous charge distribution, potential energy of a system of charged particles.	5
9.	Capacitance: Capacitance, charging a capacitor, plan capacitor, cylindrical capacitors.	4
10	Spherical capacitor, capacitors in parallel, capacitors in series, energy density.	4
Total		45

No	List of Topics

Laboratory	
1	Introduction
2	Resistor Color Code Experiment
3	Ohm's Law Experiment
4	Resistances in series and in parallel Experiment
5	Resistivity Experiment
6	Revision
7	Wheatstone Bridge and Resistivity of Metals Experiment
8	Potentiometer & Applications Experiment
9	Kirchhoff's Rules Experiment
10	The R-C Circuit Experiment

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Final Exam	17	40 %
2.	Assignment/Participation	1-17	5%
3.	Quiz	1-17	10%
4.	Midterm Exam	7	20%
5.	Lab Exam	15	25%

*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	Fundamental of Physics, by Halliday & Resnick, 11th edition (2018), John Wiley & Sons.
Supportive References	Physics for Global Scientists and Engineers – Volume 1–2ND Edition 2017- Serway- Jewett- Wilson – Rowlands - An introduction to Physical Science 15th Edition (2020) - Shipman-Wilson-Higgins-Torres.
Electronic Materials	https://files.eric.ed.gov/fulltext/ED111947.pdf
Other Learning Materials	none

2. Required Facilities and equipment

Items	Resources
facilities	Adequate classrooms with well-equipped facilities for power presentations and white boards.

Items	Resources
(Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	
Technology equipment (projector, smart board, software)	• Lecture room equipped with an overhead projector, computer, and internet connection. • Blackboard Access to Saudi Digital Library Electronic Resources
Other equipment (depending on the nature of the specialty)	Well-equipped laboratories to conduct experimental work

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	students, graduates, alumni, faculty, program leaders	Direct and Indirect
Effectiveness of Students assessment	faculty, program leaders	Direct and Indirect
Quality of learning resources	faculty, Dean office, Faculty subcommittees	Direct and Indirect
The extent to which CLOs have been achieved	Students, graduates, alumni, faculty Staff, program leaders,	Direct and Indirect
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد
NCAAA
T4
2020

توصيف المقرر الدراسي

اسم المقرر:	التفكير الناقد
رمز المقرر:	**PSY024**
البرنامج:	مقرر إعداد عام
القسم العلمي:	التربية وعلم النفس
الكلية:	التربية والآداب
المؤسسة:	جامعة تبوك

المحتويات

أ. التعريف بالمقرر الدراسي:

1. الساعات المعتمدة:
2. نوع المقرر أ. متطلب جامعة √ متطلب كلية ☐ متطلب قسم ☐ أخرى ☐ ب. إجباري √ اختياري ☐
3. السنة / المستوى الذي يقدم فيه المقرر: السنة الأولى.
4. المتطلبات السابقة لهذا المقرر (إن وجدت) لا يوجد
5. المتطلبات المتزامنة مع هذا المقرر (إن وجدت) لا يوجد

6. نمط الدراسة (اختر كل ما ينطبق)

م	نمط الدراسة	عدد الساعات التدريسية	النسبة
1	المحاضرات التقليدية	20	%50
2	التعليم المدمج	16	%40
3	التعليم الإلكتروني		
4	التعليم عن بعد	4	%10
5	أخرى	40	%100

7. ساعات الاتصال (على مستوى الفصل الدراسي)

م	النشاط	ساعات التعلم
1	محاضرات	20
2	معمل أو إستوديو	
3	دروس إضافية (تطبيقات عملية وورش عمل)	20
4	أخرى (تذكر)	
	الإجمالي	40

ب- هدف المقرر ومخرجاته التعليمية:

1. الوصف العام للمقرر:

يوجد في حياتنا اليومية الكثير من المتغيرات والتداعيات التي تفرض علينا استخدام أنواع التفكير الغير تقليدية والمنطقية، ويقدم المقرر إطاراً معرفياً وتطبيقياً للطالب الجامعي يسهم في تنمية مهارات التفكير الناقد لديه. حيث يتناول المقرر أسس التفكير الناقد ومقوماته، ويقدم تطبيقات وتمارين تنمي مهارات التفكير الناقد لدى الطالب، من خلال التعرف على مهارات الاستدلال الناقد كتحليل الحجج وتقييمها وكيفية عرضها، كما يتناول المقرر كيفية الكشف عن الخدع البلاغية والمغالطات ومن ثم يقدم تطبيقات لمهارات التفكير الناقد في حل المشكلات والقراءة الناقدة وعلى مستوى وسائل التواصل الاجتماعي

2. الهدف الرئيس للمقرر

يهدف المقرر إلى إكساب الطالب في مرحلة التهيئة للحياة الجامعية أسس ومهارات التفكير الناقد، وتوظيفها في حل المشكلات واتخاذ القرارات الصائبة وبناء العلاقات الإنسانية الناجحة، وكذلك توظيفها في تعزيز مهارات القراءة الناقدة وأساليب التعامل الواعي والفاعل مع مواقع التواصل الاجتماعي.

رمز مخرج التعلم المرتبط للجامعة ILOs	مخرجات التعلم للمقرر	
	المعرفة والفهم	1
ILO1 ILO6	أن يوضح الطالب مفهوم التفكير وخصائصه ومستوياته وأساليبه ومهاراته.	1.1
	أن يحدد الطالب مفهوم التفكير الناقد وأهميته ومعاييره ومعوقاته ومقوماته.	1.2
	أن يتعرف الطالب على مفهوم الحجة ومعايير صحتها وتصنيفاتها وعلاقتها باللغة.	1.3
	أن يميز الطالب أنواع المغالطات الغير صورية ومفهوم المشكلة وأنواع المشكلات ومكوناتها ومراحل حلها.	1.4
	المهارات	2
ILO3 ILO4 ILO5 ILO7 ILO9 ILO10	أن يطبق الطالب مهارة بناء الحجج وتحليلها وتقييمها.	2.1
	أن يكتشف الطالب المغالطات الغير صورية والخدعة البلاغية ويفرق بين الرأي والحقيقة.	2.2
	أن يطبق الطالب التفكير الناقد في حل المشكلات واتخاذ قرارات السليمة وبناء علاقات إنسانية ناجحة.	2.3
	أن يطبق الطالب التفكير الناقد في القراءة الناقدة والتعامل مع وسائل التواصل الاجتماعي.	2.4
	القيم	3
ILO4 ILO6 ILO7 ILO9 ILO10	أن يلتزم الطالب بالاستقلالية والموضوعية والأخلاقيات العلمية عند حل المشكلات واتخاذ القرارات.	3.1
	أن تتمثل لدى الطالب اتجاهات إيجابية نحو العمل الجماعي والتعاون واستغلال التقنية الحديثة في التعلم.	3.2

ج. موضوعات المقرر

ساعات الاتصال	قائمة الموضوعات	م
الأسبوع الأول (4 ساعات)	**أولا: التعريف بتوصيف المقرر ويتضمن ذلك:** ○ أهدافه ○ موضوعاته ○ طرق التدريس المتبعة ○ أساليب التقويم ومعاييرها ○ طرق التقييم ومعاييرها ○ المراجع والمصادر ○ الإرشاد الطلابي والدعم الأكاديمي **ثانيا: أهمية تعلم مهارات التفكير** ○ مفهوم التفكير ○ خصائص التفكير ○ مستويات التفكير ○ المهارات الأساسية للتفكير	1

2	**ثالثا: أسس التفكير الناقد** ○ تعريف التفكير الناقد ○ التفكير الناقد السليم ○ التفكير الناقد والعملية التعليمية ○ التفكير الناقد والتفكير غير الناقد ○ أهمية وفائدة التفكير الناقد	الأسبوع الثاني (4 ساعات)
3	**رابعا: معوقات ومقومات التفكير الناقد** ○ معوقات التفكير الناقد ○ مقومات التفكير الناقد. ○ مبادئ أساسية للتفكير الناقد. ○ التوجهات المساعدة على التفكير الناقد ○ العادات المساعدة على التفكير الناقد	الأسبوع الثالث (4ساعات)
4	**خامسا: الاستدلال الناقد.** ○ أولا: تحليل الحجج ○ ثانيا: بناء الحجج ○ ثالثا: تصنيف الحجج ○ رابعا: صحة الحجة. ○ خامسا: اللغة والحجة. ○ سادسا: تقييم الحجج ○ سابعا: كيف تعرض حججا مقنعة.	الأسبوع الرابع الأسبوع الخامس (8 ساعات)
5	**الاختبار الدوري**	الأسبوع السادس (4 ساعات)
6	**سادسا: الخدع البلاغية والمغالطات.** ○ مفهوم الحقائق والفرق بينها وبين الآراء ○ الخدعة البلاغية ○ تعريف المغالطات. ○ أنواع المغالطات 1-المغالطات الناشئة من غموض اللغة. 2-المغالطات الناشئة عن الحكم. 3- مغالطات رد الفعل.	الأسبوع السابع الأسبوع الثامن (8 ساعات)
7	**سابعا: التفكير الناقد وحل المشكلات:** ○ مفهوم حل المشكلة. ○ أنواع المشكلات. ○ مراحل الحل الناقد للمشكلات ○ تطبيقات على حل المشكلات	الأسبوع التاسع (4 ساعات)
8	**ثامنا تطبيق مهارات التفكير الناقد.**	الأسبوع العاشر

	○ القراءة الناقدة. ○ وسائل التواصل الاجتماعي. ○	(4 ساعات)
	المجموع		40 ساعة

د. التدريس والتقييم:

1. ربط مخرجات التعلم للمقرر مع كل من استراتيجيات التدريس وطرق التقييم

الرمز	مخرجات التعلم	استراتيجيات التدريس	طرق التقييم
1	المعرفة والفهم		
1.1	أن يوضح الطالب مفهوم التفكير وخصائصه ومستوياته وأساليبه ومهاراته.	المحاضرة التفاعلية، العصف الذهني، التعلم الاستكشافي، التعلم التعاوني، حل المشكلات، التعلم الذاتي	1.استمارة تقييم ملف الإنجاز. 2.درجات المناقشات والأنشطة والواجبات. 3.نماذج التغذية الراجعة. 4.الاختبارات.
1.2	أن يحدد الطالب مفهوم التفكير الناقد وأهميته ومعاييره ومعوقاته ومقوماته.		
1.3	أن يتعرف الطالب على مفهوم الحجة ومعايير صحتها وتصنيفاتها وعلاقتها باللغة.		
1.4	أن يميز الطالب أنواع المغالطات الغير صورية ومفهوم المشكلة وأنواع المشكلات ومكوناتها ومراحل حلها.		
2.0	المهارات		
2.1	أن يطبق الطالب مهارة بناء الحجج وتحليلها وتقييمها.	المحاضرة التفاعلية، العصف الذهني، التعلم الاستكشافي، التعلم التعاوني، حل المشكلات، التعلم الذاتي.	1.استمارة تقييم ملف الإنجاز. 2.درجات المناقشات والأنشطة والواجبات. 3.نماذج التغذية الراجعة. 4.الاختبارات.
2.2	أن يكتشف الطالب المغالطات الغير صورية والخدعة البلاغية ويفرق بين الرأي والحقيقة.		
2.3	أن يطبق الطالب التفكير الناقد في حل المشكلات واتخاذ قرارات السليمة وبناء علاقات إنسانية ناجحة.		
2.4	أن يطبق الطالب التفكير الناقد في القراءة الناقدة والتعامل مع وسائل التواصل الاجتماعي.		
3.0	القيم		
3.1	أن يلتزم الطالب بالاستقلالية والموضوعية والأخلاقيات العلمية عند حل المشكلات واتخاذ القرارات.	المحاضرة التفاعلية، العصف الذهني، التعلم الاستكشافي، التعلم التعاوني، حل المشكلات، التعلم الذاتي.	1.استمارة تقييم ملف الإنجاز. 2.درجات المناقشات والأنشطة والواجبات. 3.نماذج التغذية الراجعة. 4.الاختبارات.
3.2	أن تتمثل لدى الطالب اتجاهات إيجابية نحو العمل الجماعي والتعاون واستغلال التقنية الحديثة في التعلم.		

2. أنشطة تقييم الطلبة

م	أنشطة التقييم	توقيت التقييم (بالأسبوع)	النسبة من إجمالي درجة التقييم
1	الاختبارات القصيرة (كوزات)	الاسبوع 4- 9	10%
2	ملفات الانجاز	الأسبوع 4-6-9-11	%20
3	النقاش والمحادثة	كل اسبوع	%10
4	اختبار فصلي تحريري	السابع	20%

م	أنشطة التقييم	توقيت التقييم (بالأسبوع)	النسبة من إجمالي درجة التقييم
5	الاختبار النهائي	الأسبوع 12	40%
	الإجمالي	12 أسبوع	100%

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

هـ - أنشطة الإرشاد الأكاديمي والدعم الطلابي:

- التواصل المباشر بين المرشد الأكاديمي والطلاب الذين يرشدهم أكاديمياً.
- تواجد عضو هيئة التدريس المسؤول عن تدريس المقرر خلال الساعات المكتبية بالقسم لمدة ساعتين.
- مناقشة الطلاب الذين لديهم مشكلات أكاديمية وتقديم النصح والإرشاد المناسب لكل حالة.
- التواصل إلكترونياً من خلال البلاك بورد بين عضو هيئة التدريس والطلاب.

و – مصادر التعلم والمرافق:

1. قائمة مصادر التعلم:

المرجع الرئيس للمقرر	النويهي ، سهام (2009) التفكير الناقد، دار الثقافة الجديدة ،القاهرة. زغلول ، رافع ، و زغلول، عماد (2014) علم النفس المعرفي ، دار الشروق، عمان.
المراجع المساندة	1-Waller. Bruce. Critical Thinking Consider the Verdict.(2012). Pearson Education. Youngstown State University. 2-Cohen. Martin. Critical Thinking Skills for Dummies (2015) John Wiley and Son Ltd. West Sussex. 3 - Swatridge. Colin. Oxford Guide to Effective Argument and Critical Thinking (2014) OUP Oxford. 4- Bassham, G.; (et al), Critical Thinking: A Student's Introduction, Library of Congress, 2002. 5- Fowler, B., Critical Thinking Across The Curriculum Project, www.kcmetro.cc.mo.us/tong definitions.htm, 2/7/2006. view/ Clac 6- Kurlants, D., www.critical Reading.com -Ruggiero, V.R., Becoming a Critical Thinker, Houghton, Mifflin Company, 2002 7 8-هيلات، مصطفى قسيم (2015)، كيف تكون مفكرا ناقدا لامعا، مركز ديبونو لتعليم التفكير، عمان، الأردن. 9-جميل، عصام (2012) المنطق والتفكير الناقد، دار المسيرة للنشر والتوزيع والطباعة، عمان الأردن. 10-عادل، مصطفى، (2007)، المغالطات المنطقية طبيعتنا الثانية وخبزنا اليومي فصول في المنطق الغير صوري، المجلس الأعلى للثقافة، القاهرة، مصر. 11-فيشر، آليك، ترجمة ياسر العيني (2009)، التفكير الناقد، دار السيد للنشر، الرياض، المملكة العربية السعودية. 12- تريسي بويل، وجاري كمب، ترجمة عصام زكريا جميل (2015)، التفكير النقدي. المركز القومي للترجمة، القاهرة. 13- براون، نيل وكيي، سيتورات ترجمة نجيب الحصادي ومحمد السيد (2019) التفكير الناقد: طرح الأسئلة المناسبة، رؤية للنشر والتوزيع، القاهرة.
المصادر الإلكترونية	
أخرى	

2. المرافق والتجهيزات المطلوبة:

العناصر	متطلبات المقرر
المرافق (القاعات الدراسية، المختبرات، قاعات العرض، قاعات المحاكاة ... إلخ)	القاعات الدراسية، قاعات العرض، قاعة بطاولة مستديرة لممارسة مهارات العصف الذهني.
التجهيزات التقنية (جهاز عرض البيانات، السبورة الذكية، البرمجيات)	جهاز عرض البيانات.
تجهيزات أخرى (تبعاً لطبيعة التخصص)	البحث في الشبكة العنكبوتية عن أمثلة على استخدام المحاجاة والبراهين ومناقشتها، سواء في العصور القديمة ومنها الاسلامية أو من خلال تتبعها في العصر الحالي.

ز. تقويم جودة المقرر:

مجالات التقويم	المقيمون	طرق التقييم
فاعلية التدريس	الطلاب	**1. الطريقة المباشرة:** فحص عينات فعلية من أعمال الطلاب في المقرر الدراسي مثل الواجبات، والمشروعات...إلخ **2. الطريقة الغير مباشرة:** • **المقابلات** بين الطلاب وأعضاء هيئة التدريس للحصول على التغذية الراجعة الشفوية من الطلاب. • **استطلاعات الرأي**: تعبئة استبانة تقويم المقرر من قبل الطلاب.
المنهج والمحتوى الدراسي	- الطلاب. - المراجع النظير (منسق المقرر، القائمون بتدريس المقرر).	
استراتيجيات التدريس	- الطلاب. - المراجع النظير (منسق المقرر، القائمون بتدريس المقرر).	
طرق تقييم الطلاب	- الطلاب. - المراجع النظير (منسق المقرر، القائمون بتدريس المقرر).	
تحصيل الطلاب	- رئيس القسم. - لجنة الجودة والاعتماد الأكاديمي.	مراجعة وتقييم **تقارير المقررات** الفصلية، و**التقرير السنوي للبرنامج**.
المراجعة الدورية لتوصيف المقررات للوقوف على جوانب التحسين	- الطلاب. - المراجع النظير (منسق المقرر، القائمون بتدريس المقرر). - لجنة البرامج والخطط الدراسية بالقسم.	**المقابلات** المنتظمة بين منسق المقرر، والقائمين على تدريس المقرر في الشعب المختلفة.

مجالات التقويم	المقيمون	طرق التقييم

مجالات التقويم (مثل. فاعلية التدريس، فاعلة طرق تقييم الطلاب، مدى تحصيل مخرجات التعلم للمقرر، مصادر التعلم ... إلخ)
المقيمون (الطلبة، أعضاء هيئة التدريس، قيادات البرنامج، المراجع النظير، أخرى (يتم تحديدها)
طرق التقييم (مباشر وغير مباشر)

ح. اعتماد التوصيف

جهة الاعتماد	قسم التربية وعلم النفس
رقم الجلسة	19
تاريخ الجلسة	1443/9/19