Third level courses (Junior)

First semester (Fall)

No.	Cod	Course Name	Instructor
1	CECE 301	Electronics I	Ass.Prof. Dr. Ashraf Mohamed Ali Hassan
2	CECE 313	Electrical and Electronic Measurements	Dr. Ibrahim Ali Mahmoud Abdel Dayem
3	CECE 202	Measurements & Instrumentation Lab	Dr. Ibrahim Ali Mahmoud Abdel Dayem
4	CECE 303	Signals and Systems	Ass.Prof. Dr. Ashraf Mohamed Ali Hassan
5	CECE 204	Computer Organization	Dr. Mohamed Mahmoud Ahmed Mohamed El-Ghoboushi
6	BASE 402	Feasibility Studies	Dr. Mohamed Mahmoud Badawy
7	MATH 301	Probability & Statistic	Dr. Gamal El-Anani

Course specification

Course code:	Course name
CECE 301	Electronic 1

A- Affiliation

Relevant program:	Electrical power engineering
Department offering the program:	Electrical and communication engineering
Department offering the course:	Electrical and communication engineering
Date of program operation:	2008-2009
Date of approval from the higher ministry of education	27/1/2008
Date of course operation	٢٠٢٣-٢٠٢٤

B- Basic Information

Course Name	Electronic 1
Code	CECE 301
Course Level	Third level courses (Junior) - First semester (Fall)
Credit Hours	3Cr. hr
Lectures	2hr
lab	3hr
Total	5hr
Prerequisite	CECE 203
Instructor name/Email	Ass.Prof. Dr. Ashraf Mohamed Ali Hassan ashraf.ali@sva.edu.eg

c- Professional information

1-Course core

Introduction to conductor, semi-conductor materials; dropping, gap energy, diodes; transistors, Types of Electronic Devices, properties of electronics devices, Operational Amplifiers, Amplifiers using Bipolar Junction Transistors (BJT's) & Field Effect Transistors (FET's). Basics of transformers, machines, and generators

2- Course learning objectives:

oc 1	Recognize the basic science for semiconductor materials, dropping, gap energy
oc 2	Recognize the diodes, types of Electronic Devices, properties of electronics devices,
oc 3	Recognize the Operational Amplifiers, Amplifiers using Bipolar Junction Transistors (BJT's) & Field Effect Transistors (FET's).

3- Learning outcomes of the course (LOs)

Upon the completion of the course, the student should be able to:

a. Cognitive Domains (LOs):

LO1	Recognize the basic concepts of operational amplifier
LO2	Recognize different types of field effect transistors
b.	**Psychomotor Domains (LOs):**
LO3	Apply the fundamentals concepts of semiconductor materials
LO4	Apply the basic knowledge of transformer
LO5	Apply the knowledge of Bipolar junction transistor as a switch and as an amplifier
	c- Affective Domains (LOs):
LO6	Express the analysis of small and high frequency signal analysis for transistor

4- Program LOs served by the course:

Upon the completion of the Program the student should be able to:

Lo11.	Principles of for electrical equipment and systems.
Lo12.	Principles of operation and performance specifications of electrical and electromechanical engineering systems .
Lo19.	Solve complex engineering problems and solve problems in the field of electrical and electrical power engineering.
Lo29.	Utilize computer program to analyze design problems and interpret numerical data and test and examine components, equipment and systems of electrical and electric power generation, control, and distribution systems.
Lo39.	Show accuracy while Designing experiments, as well as analyzing and interpreting experimental results related to electrical and electrical power systems.

5- The relation between the course learning outcomes and the program competencies

	Course (LOs)		**program competencies**
LO1	Recognize the basic concepts of operational amplifier	**Lo11.**	Principles of for electrical equipment and systems.
LO2	Recognize different types of field effect transistors	**Lo12.**	Principles of operation and performance specifications of electrical and electromechanical engineering systems .
LO3	Apply the fundamentals concepts of semiconductor materials	**Lo19.**	Solve complex engineering problems and solve problems in the field of electrical and electrical power engineering.
LO4	Apply the basic knowledge of transformer	**Lo29.**	Utilize computer program to analyze design problems and interpret numerical data and test and examine components, equipment and systems of electrical and electric power generation, control, and distribution systems.

LO5	Apply the knowledge of Bipolar junction transistor as a switch and as an amplifier	**Lo29.**	Utilize computer program to analyze design problems and interpret numerical data and test and examine components, equipment and systems of electrical and electric power generation, control, and distribution systems.
LO6	Express the analysis of small and high frequency signal analysis for transistor	**Lo39.**	Show accuracy while Designing experiments, as well as analyzing and interpreting experimental results related to electrical and electrical power systems.

6- Course content and the relation between the course contents and the course LOs

Week No.	Topic	Lecture hr.	Tutorial hr.	Practical hours	course LOs
1	The fundamentals concepts of semiconductor materials	2	0	2	LO3
2	Understanding the basic concepts of operational amplifier	2	0	2	LO1
3	Introduction to transformer	2	0	2	LO4
4	Bipolar junction transistor as a switch	2	0	2	LO5
5	Bipolar junction transistor as an amplifier	2	0	2	LO1
6	Field effect transistor	2	0	2	LO4
7	Metal oxide transistor	2	0	2	LO5
8	Midterm		1.0		
9	Small and high frequency signal analysis for transistor	2	0	2	LO2
10	Analysis Amplifier frequency response	2	0	2	LO6
11	Introduction to electrical machine	2	0	2	LO4
12	Design Dc Machinery concept and Dc - Motors	2	0	2	LO6
13	Revision	2	0	2	LO3
14	Small and high frequency signal analysis for transistor	2	0	2	LO2
15	Small and high frequency signal analysis for transistor	2	0	2	LO2
16	Final Exam		2.0		
Total hours		28	-	28	--

7- The Teaching and learning methods and their relation to the Los of the course

Course learning Outcomes (LOs)	Teaching and Learning Methods

	On line / face to face lectures	Tutorials: sheets/ sketches	projects	Problem solving	Brain storming	Practical: lab	Discovering / Self learning	Site visit	Reports/ researches	Cooperative work	presentation	Discussion	modelling
LO3	✓												
LO1	✓	✓											
LO4	✓	✓	✓	✓	✓	✓	✓		✓	✓			✓
LO5	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
LO2	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
LO6	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓

Notes:

The research concerns the cooperative work, the discussion and the presentations.

The Tutorials concerns the brain storming and the problem solving.

Online lectures used as hybrid learning, but in case of totally on-line learning all the used teaching and learning methods will be on line.

8- Student assessment method

a- Assessment method and its relation to the Los of the course

Course ILOs	Tools of assessment										
	quizzes	Mid -term exam	Final exam	sheets/ sketches	projects	Practical: lab	Oral exam	discussions	Reports/ researches	presentation	modelling
LO3											
LO1											
LO4	✓	✓	✓	✓	✓	✓	✓		✓		✓
LO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
LO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
LO6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

b- Time schedule of assessment

Quizzes	Quiz (1)	Week (3)
	Quiz (2)	Week (10)
Discussions		Every week for any student
Presentations and Movies		weekly
Sheets and Sketches		weekly
Researches and reports		Week (2,3)
the Projects		Week (4,8)
Practical modelling		Week (4,8)
Attendance		weekly
Mid-term exam		Week (8)

final exam		Week (16)	

c- Grading system

quizes	Quiz (1)	(5) marks	
	Quiz (2)	(5) marks	
Discussions	15%		
Sheets and Sketches	20%		
Researches and reports	20%	5 marks	(40) marks
the Projects and lab	30%		
Practical modelling	20%		
Attendance		(10) marks	
Mid-term exam		(15) marks	
final exam			(60) marks
Total			(100) marks

10- List of references:

a) Course notes	Lecture notes and handouts
b) Required books	▪ Adel S. Sedra, Kenneth C. Smith, 'Microelectronic Circuits (The Oxford Series in Electrical and Computer Engineering) 8th Edition. ▪ Behazad Rzavi, John Wiley Fundamentals of Microelectronics, 3rd Edition ▪ Thomas L. Floyd, 'Electronic Devices, Global Edition 10th Edition. ▪ Donald Neamen, 'Microelectronics: Circuit Analysis & Design,' 4th edition, Mcgraw Hill, 2009.
c) Recommend books	Mentioned at time.
d) Periodicals, Web sites, etc	No periodicals are needed.

11- Facilities required for teaching and learning:

- Appropriate teaching design studios including presentation board, data show
- Google classroom
- E- learning

12- Requirements for Disable facilities:

- On line teaching hours if it is needed
- Extra examples and topic-specified research

Course coordinator:	Ass.Prof. Dr. Ashraf Mohamed Ali Hassan
program Coordinator	Dr. Ehab Mohamed Nabil Ismail Abdel Rasoul
Head of the Department	Dr. Ibrahim Ali Mahmoud Abdel Dayem
Date:	٢٠٢٣/٢٠٢٤

Course specification

Course code:	Course name
CECE 330	Electrical and Electronic Measurements
A- Affiliation	
Relevant program:	Electrical power engineering
Department offering the program:	Electrical and communication engineering
Department offering the course:	Electrical and communication engineering
Date of program operation:	2008-2009
Date of approval from the higher ministry of education	27/1/2008
Date of course operation	**٢٠٢٣-٢٠٢٤**

B- Basic Information

Course Name	Electrical and Electronic Measurements
Code	CECE 330
Course Level	Third level courses (Junior) - First semester (Fall)
Credit Hours	3Cr. hr
Lectures	2hr
Tutorial	2hr
Total	4hr
Prerequisite	CECE 203
Instructor name/Email	Dr. Ibrahim Ali Mahmoud Abdel Dayem dr.ibrahim@sva.edu.eg

A- Professional information

1-Course core

Definitions, functions and properties of instruments measuring, error analysis of measurement methods, analog and digital electric measurement devices (Oscilloscopes, signal generators, spectrum analyzer), computer systems for testing and measuring.

2-Course learning objectives:

oc 1	Recognize the functions and properties of instruments measuring system.
oc 2	Recognize the error analysis of measurement methods.
oc 3	Recognize the analogue and digital electric measurement devices (Oscilloscopes, signal generators, spectrum analyzer).
oc 4	Recognize the computer systems for testing and measuring.

3- Learning outcomes of the course (LOs)

Upon the completion of the course, the student should be able to:

a. Cognitive Domains (LOs):

LO1	Recognize the functions and properties of instruments measuring system.
LO2	identify the system error analysis of measurement methods.

LO3	Recognize with the analogue and digital electric measurement devices (Oscilloscopes, signal generators, spectrum analyzer).
LO4	recognize with the computer systems for testing and measuring.

b. Psychomotor Domains (LOs):

LO5	Produce the comparative between systematic errors and gross errors.
LO6	Produce the percentage of errors in electrical measurements.

c. Affective Domains (LOs):

-	None

4- Program LOs served by the course:

Upon the completion of the Program the student should be able to:

Lo11.	Principles of for electrical equipment and systems.
Lo12.	Principles of operation and performance specifications of electrical and electromechanical engineering systems .
Lo19.	Solve complex engineering problems and solve problems in the field of electrical and electrical power engineering.
Lo29.	Utilize computer program to analyze design problems and interpret numerical data and test and examine components, equipment and systems of electrical and electric power generation, control, and distribution systems.

5- The relation between the course learning outcomes and the program LOs

Course (LOs)		program LOs	
LO1	Recognize the functions and properties of instruments measuring system.	**Lo11.**	Principles of for electrical equipment and systems.
		Lo12.	Principles of operation and performance specifications of electrical and electromechanical engineering systems .
LO2	Recognize the functions and properties of instruments measuring system.	**Lo11.**	Principles of for electrical equipment and systems.
		Lo12.	Principles of operation and performance specifications of electrical and electromechanical engineering systems .
LO3	Recognize with the analogue and digital electric measurement devices (Oscilloscopes, signal generators, spectrum analyzer).	**Lo12.**	Principles of operation and performance specifications of electrical and electromechanical engineering systems .

LO4	recognize with the computer systems for testing and measuring.	**Lo12.**	Principles of operation and performance specifications of electrical and electromechanical engineering systems .
LO5	Produce the comparative between systematic errors and gross errors.	**Lo19.**	Solve complex engineering problems and solve problems in the field of electrical and electrical power engineering.
LO6	Produce the comparative between systematic errors and gross errors.	**Lo29.**	Utilize computer program to analyze design problems and interpret numerical data and test and examine components, equipment and systems of electrical and electric power generation, control, and distribution systems.

5- Course content and the relation between the course contents and the course LOs

Week No.	Topic	Lecture hr.	Tutorial hr.	Practical hours	course LOs
1	Digital measurements Digital voltmeter–Digital ammeter –Digital ohmmeter	2	2	0	LO1
2	Measurements of current, voltage, resistance, frequency, time, amplitude and power	2	2	0	LO1
3	Accuracy of measurement and error analysis.	2	2	0	LO1
4	Quiz (1) + Absolute & secondary Error.	2	2	0	LO2
5	Basic of statistical analysis.	2	2	0	LO5
6	Electromechanical instruments.	2	2	0	LO5
7	Permanent magnet moving coil construction.				LO5
8	Midterm		1.0		
9	Galvanometer.	2	2	0	LO5
10	Dc Ammeter.	2	2	0	LO5
11	Multirange Ammeters.	2	2	0	LO3
12	Quiz (2) +solve example.	2	2	0	LO4
13	DC Voltmeter Circuit.	2	2	0	LO6
14	Rectifier Voltmeter.	2	2	0	LO3
15	Rectifier Ammeter.				LO6
16	Final Exam		2.0		
Total hours		28	28	0	--

6- The Teaching and learning methods and their relation to the Los of the course

Course learning Outcomes (LOs)	Teaching and Learning Methods												
	On line / face to face lectures	Tutorials: sheets/ sketches	projects	Problem solving	Brain storming	Practical: lab	Discovering / self learning	Site visit	Reports/ researches	Cooperative work	presentation	Discussion	modelling
LO1	✓												
LO2	✓	✓											
LO5	✓	✓	✓	✓	✓		✓		✓	✓			✓
LO6	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓
LO3	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓
LO4	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓

Notes:

The research concerns the cooperative work, the discussion and the presentations.

The Tutorials concerns the brain storming and the problem solving.

Online lectures used as hybrid learning, but in case of totally on-line learning all the used teaching and learning methods will be on line.

7- Student assessment method

a- Assessment method and its relation to the Los of the course

Course ILOs	Tools of assessment										
	quizzes	Mid -term exam	Final exam	sheets/ sketches	projects	Practical: lab	Oral exam	discussions	Reports/ researches	presentation	modelling
LO1											
LO2											✓
LO5	✓	✓	✓	✓	✓		✓		✓		✓
LO6	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
LO3	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
LO4	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓

b- Time schedule of assessment

Quizzes	Quiz (1) Quiz (2)	Week (3) Week (10)
Discussions		Every week for any student
Presentations and Movies		weekly
Sheets and Sketches		weekly
Researches and reports		Week (2,3)
the Projects		Week (4,8)
Practical modelling		Week (4,8)
Attendance		weekly
Mid-term exam		Week (7)
final exam		Week (14)

c- Grading system

quizes	Quiz (1) Quiz (2)	(5) marks (5) marks	
Discussions	15%		
Sheets and Sketches	20%		
Researches and reports	20%	5 marks	(40) marks
the Projects	30%		
Practical modelling	20%		
Attendance		(10) marks	
Mid-term exam		(15) marks	
final exam			(60) marks
Total			(100) marks

10- List of references:

a) Course notes	Lecture notes and handouts
b) Required books	▪ Electronic Instrumentation and Measurements- 2nd Edition, David A. Bell
c) Recommend books	Mentioned at time.
d) Periodicals, Web sites, etc	No periodicals are needed.

11- Facilities required for teaching and learning:

- Appropriate teaching design studios including presentation board, data show
- Google classroom
- E- learning

12- Requirements for Disable facilities:

- On line teaching hours if it is needed
- Extra examples and topic-specified research

Course coordinator:	Dr. Ibrahim Ali Mahmoud Abdel Dayem
program Coordinator	Dr. Ehab Mohamed Nabil Ismail Abdel Rasoul
Head of the Department	Dr. Ibrahim Ali Mahmoud Abdel Dayem
Date:	٢٠٢٣/٢٠٢٤

Course specification

Course code:	Course name
CECE 313	Measurements & Instrumentation Lab
A- Affiliation	
Relevant program:	Electrical power engineering
Department offering the program:	Electrical and communication engineering
Department offering the course:	Electrical and communication engineering
Date of program operation:	2008-2009
Date of approval from the higher ministry of education	27/1/2008
Date of course operation	٢٠٢٣-٢٠٢٤

B- Basic Information

Course Name	Electrical and Electronic &Measurements Lab
Code	CECE 313
Course Level	Third level courses (Junior) - First semester (Fall)
Credit Hours	1Cr. Hr
Lectures	0hr
lab	3hr
Total	3hr
Prerequisite	Conc. with CECE 330
Instructor name/Email	Dr. Ibrahim Ali Mahmoud Abdel Dayem dr.ibrahim@sva.edu.eg

C- Professional information

1- Course core

Includes error analysis, linear displacement transducers, strain gauge, rotational speed measurement, capacitive and inductive transducers, temperature measurement, measurement of pressure and flow, and ultrasonic measurement systems.

2- Course learning objectives:

oc 1	Recognize the International System of Units (measurement system).
oc 2	Recognize the units and demonstrate the ability to convert measurements.
oc 3	Recognize the length, temperature, time, volume, mass, density, and concentration.

3- Learning outcomes of the course (LOs)

Upon the completion of the course, the student should be able to:

a. Cognitive Domains (LOs):

-	None

b. Psychomotor Domains (LOs):	
LO1	prepare the potentiometers to measure AC and DC values of unknown voltage.
LO2	Use laboratory to measure the wattmeter and energy meter to measure power and energy.
LO3	Use laboratory to measure high values of current and voltage.
LO4	Use laboratory to measure voltage and Current.
LO5	Prepare the bridges for the measurement of low, medium and high resistance.
c. Affective Domains (LOs):h	
LO6	Communicate effectively with the bridges for the measurement of inductance and capacitance measurement.

4- Program LOs served by the course:

Upon the completion of the Program the student should be able to:

Lo29.	Utilize computer program to analyze design problems and interpret numerical data and test and examine components, equipment and systems of electrical and electric power generation, control, and distribution systems.
Lo30.	Integrate electrical, electronic, and mechanical components and equipment with transducers, actuators, and controllers in creatively computer-controlled systems.
Lo39.	Show accuracy while Designing experiments, as well as analyzing and interpreting experimental results related to electrical and electrical power systems.

4- The relation between the course learning outcomes and the program competencies

Course (LOs)		program competencies	
LO1	prepare the potentiometers to measure AC and DC values of unknown voltage.	**Lo29.**	Utilize computer program to analyze design problems and interpret numerical data and test and examine components, equipment and systems of electrical and electric power generation, control, and distribution systems.
LO2	Use laboratory to measure the wattmeter and energy meter to measure power and energy.	**Lo30.**	Integrate electrical, electronic, and mechanical components and equipment with transducers, actuators, and controllers in creatively computer-controlled systems.
LO3	Use laboratory to measure high values of current and voltage.	**Lo30.**	Integrate electrical, electronic, and mechanical components and equipment with transducers, actuators, and controllers in creatively computer-controlled systems.
LO4	Use laboratory to measure voltage and Current.	**Lo30.**	Integrate electrical, electronic, and mechanical components and equipment with transducers, actuators, and controllers in creatively computer-controlled systems.

LO5	Prepare the bridges for the measurement of low, medium and high resistance.	**Lo30.**	Integrate electrical, electronic, and mechanical components and equipment with transducers, actuators, and controllers in creatively computer-controlled systems.
LO6	Communicate effectively with the bridges for the measurement of inductance and capacitance measurement.	**Lo39.**	Show accuracy while Designing experiments, as well as analyzing and interpreting experimental results related to electrical and electrical power systems.

5- Course content and the relation between the course contents and the course LOs

Week No.	Topic	Lecture hr.	Tutorial hr.	Practical hours	course LOs
1	Working and Characteristics of Various Types of Meters.	0	0	2	LO4
2	Measurement of the Low Resistance.	0	0	2	LO4
3	Sensitive Voltage/Audio Detector.	0	0	2	LO4
4	Voltmeter usage.	0	0	2	LO2
5	Ohmmeter usage.	0	0	2	LO3
6	A very simple circuit.	0	0	2	LO3
7	Ammeter usage.	0	0	2	LO3
8	Midterm		1.0		
9	DC and AC bridges.	0	0	2	LO5
10	Ohm's law.	0	0	2	LO5
11	Nonlinear resistance.	0	0	2	LO6
12	DC Voltmeter Circuit.	0	0	2	LO6
13	Multirange Ammeters.	0	0	2	LO1
14	Rectifier Voltmeter.	0	0	2	LO5
15	Rectifier Ammeter.	0	0	2	LO5
16	Final Exam		2.0		
Total hours		0	0	28	--

6- The Teaching and learning methods and their relation to the Los of the course

Teaching and Learning Methods

Course learning Outcomes (LOs)	On line / face to face lectures	Tutorials: sheets/ sketches projects	Problem solving	Brain storming	Practical: lab	Discovering / self learning	Site visit	Reports/ researches	Cooperative work	presentation	Discussion	modelling
Lo4	✓	✓ ✓			✓	✓			✓	✓	✓	
Lo2	✓	✓ ✓			✓	✓			✓	✓	✓	
Lo3	✓	✓ ✓			✓	✓			✓	✓	✓	
Lo5	✓	✓ ✓			✓	✓			✓	✓	✓	
Lo6	✓	✓ ✓			✓	✓			✓	✓	✓	
LO1	✓	✓ ✓			✓	✓			✓	✓	✓	

Notes: *The research concerns the cooperative work, the discussion, the site visit and the presentations.*
The Tutorials concerns the brain storming and the problem solving.
Online lectures used as hybrid learning, but in case of totally on-line learning all the used teaching and learning methods will be on line.

7- Student assessment method

a- Assessment method and its relation to the Los of the course

Course ILOs	Tools of assessment											
	quizzes	Mid -term exam	Final exam	sheets/ sketches	projects	Practical: lab	Oral exam	discussions	Reports/ researches	presentation		modelling
Lo4		✓	✓	✓	✓	✓	✓	✓		✓		
Lo2		✓	✓	✓	✓	✓	✓	✓		✓		
Lo3		✓	✓	✓	✓	✓	✓	✓		✓		
Lo5		✓	✓	✓	✓	✓	✓	✓		✓		
Lo6		✓	✓	✓	✓	✓	✓	✓		✓		
LO1		✓	✓	✓	✓	✓	✓	✓		✓		

b- Time schedule of assessment

Discussions	Every week for any student
Presentations and Movies	weekly
Sheets and Sketches	weekly
the Projects	weekly
Attendance	weekly
Mid-term exam	Week (8)
final exam	Week (16)

c- Grading system

Discussions	20%		
Sheets and Sketches	70%	40 marks	(60) marks
the Projects	10%		
Attendance		(10) marks	

Mid-term exam	(10) marks
final exam	(40) marks
Total	(100) marks

10- List of references:

a) Course notes	Lecture notes and handouts
b) Required books	David A. Bell , Electronic Instrumentation And Measurements, 4Th Edition.
c) Recommend books	Mentioned at time.
d) Periodicals, Web sites, etc	No periodicals are needed.

11- Facilities required for teaching and learning:

- Appropriate teaching design studios including presentation board, data show
- Google classroom
- E- learning

12- Requirements for Disable facilities:

- On line teaching hours if it is needed
- Extra examples and topic-specified research

Course coordinator:	Dr. Ibrahim Ali Mahmoud Abdel Dayem
program Coordinator	Dr. Ehab Mohamed Nabil Ismail Abdel Rasoul
Head of the Department	Dr. Ibrahim Ali Mahmoud Abdel Dayem
Date:	٢٠٢٣/٢٠٢٤

Ministry of higher education
High valley institute for engineering and technology
Electrical power engineering program

Course specification

Course code:	Course name
CECE303	Signals and Systems

A- Affiliation

Relevant program:	Electronics and communication engineering
Department offering the program:	Electrical and communication engineering
Department offering the course:	Electrical and communication engineering
Date of program operation:	2008-2009
Date of approval from the higher ministry of education	27/1/2008
Date of course operation	202٣-202٤

B- Basic Information

Course Name	Signals and Systems
Code	CECE303
Course Level	Third level courses (Junior) - First semester (Fall)
Credit Hours	3Cr. Hr
Lectures	2hr
Tutorial	2hr
Total	4hr
Prerequisite	CECE 203
Instructor name/Email	Ass.Prof. Dr. Ashraf Mohamed Ali Hassan ashraf.ali@sva.edu.eg

C- Professional information

1- Course core

Basic properties of signals and systems, stability, causality, step and impulse response, linearity, time variance and time invariance properties, superposition integral, Fourier series and Fourier transform for discrete and continuous time signals and sampling theorem. Laplace transformation, Properties of frequency transformations, Hilbert transformation; concept of analytic signals. Transfer function of linear systems

2- Course learning objectives:

oc 1	Recognize the analysis of signals that includes.
oc 2	Recognize the physical meaning of signals Classify the different kinds of signals.
oc 3	Recognize the different applications of signals. Know the Elementary or basic signals [unit-step function, Ramp function, unit impulse function, sampling function, complex exponential, Sinc signal, Gate signal, and signum signal] and understand and analyze the Sampling theory.
oc 4	Recognize the main elements required to convert the signal from analog to digital that includes: [Sampling, Quantization, and coding].
oc 5	Recognize and discriminate between Convolution, and Correlation of signals.

oc 6	Recognize the basic operations of signals [Addition, multiplication, Shifting, reflection, amplitude scaling, and time scaling].
oc7	Recognize and analyze the different signal transformation techniques, their applications and proprieties: Fourier series, Fourier transform [FT] Inverse Fourier transform [IFT] and Discrete Fourier transform [DFT].

3- Learning outcomes of the course (LOs)

Upon the completion of the course, the student should be able to:

a. Cognitive Domains (LOs):

LO1	Identify the different types of signals.
LO2	Recognize the basic principles of the properties of the signal.
LO3	evaluate the mathematical method to derive frequency domain of the continuous signal.

b. Psychomotor Domains (LOs):

LO4	Apply knowledge to recognize the effect of continuous input signal on the system.

c. Affective Domains (LOs):

LO5	Express effectively with the frequency components of the discrete signal

4- Program LOs served by the course:

Upon the completion of the Program the student should be able to:

Lo10.	Identify the basic knowledge in mathematics, science and engineering in Communication Engineering field.
Lo19.	Solve complex engineering problems and solve problems in the field of electrical and electrical power engineering.
Lo28.	knowledge to design and conduct experiments, analyze, synthesize and interpret the data pertaining to Communication Engineering problems and arrive at valid conclusion.
Lo38.	Develop consciousness of professional, ethical and social responsibilities as experts in the field of Communication Engineering

5- The relation between the course learning outcomes and the program competencies

Course (LOs)		program competencies	
LO1	Identify the different types of signals.	**Lo10.**	Identify the basic knowledge in mathematics, science and engineering in Communication Engineering field.
LO2	Recognize the basic principles of the properties of the signal.	**Lo19.**	Solve complex engineering problems and solve problems in the field of

			electrical and electrical power engineering.
LO3	evaluate the mathematical method to derive frequency domain of the continuous signal.	**Lo19.**	Solve complex engineering problems and solve problems in the field of electrical and electrical power engineering.
LO4	Apply knowledge to recognize the effect of continuous input signal on the system.	**Lo28.**	knowledge to design and conduct experiments, analyze, synthesize and interpret the data pertaining to Communication Engineering problems and arrive at valid conclusion.
LO5	Express effectively with the frequency components of the discrete signal	**Lo38.**	Develop consciousness of professional, ethical and social responsibilities as experts in the field of Communication Engineering

6- Course content and the relation between the course contents and the course LOs

Week No.	Topic	Lecture hr.	Tutorial hr.	Practical hours	course LOs
1	Signal Definition	2	2	0	LO1
2	Signal Types	2	2	0	LO1
3	System Classification	2	2	0	LO1
4	Convolution	2	2	0	LO2
5	Convolution	2	2	0	LO2
6	Fourier series	2	2	0	LO4
7	Fourier transform	2	2	0	LO5
8	Midterm		1.0		
9	Fourier transform	2	2	0	LO5
10	Discrete Fourier Transform	2	2	0	LO5
11	Discrete Fourier Transform	2	2	0	LO5
12	Laplace Transform	2	2	0	LO5
13	Laplace Transform Cont.	2	2	0	LO3
14	Sampling Process	2	2	0	LO3
15	Sampling Process	2	2	0	LO3
16	Final Exam		2.0		
Total hours		28	28	0	--

7- The Teaching and learning methods and their relation to the Los of the course

Course learning Outcomes (LOs)	Teaching and Learning Methods												
	On line / face to face lectures	Tutorials: sheets/ sketches	projects	Problem solving	Brain storming	Practical: lab	Discovering/ self learning	Site visit	Reports/ researches	Cooperative work	presentation	Discussion	modelling
LO1	✓												
LO2	✓	✓											
LO4	✓	✓	✓	✓	✓		✓		✓	✓			✓
LO5	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓
LO3	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓

Notes:

The research concerns the cooperative work, the discussion and the presentations.

The Tutorials concerns the brain storming and the problem solving.

Online lectures used as hybrid learning, but in case of totally on-line learning all the used teaching and learning methods will be on line.

8- Student assessment method

a- Assessment method and its relation to the Los of the course

Course ILOs	Tools of assessment										
	quizzes	Mid -term exam	Final exam	sheets/ sketches	projects	Practical: lab	Oral exam	discussions	Reports/ researches	presentation	modelling
LO1											
LO2											
LO4	✓	✓	✓	✓	✓		✓		✓		✓
LO5	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
LO3	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓

b- Time schedule of assessment

Quizzes	Quiz (1)	Week (3)
	Quiz (2)	Week (10)
Discussions		Every week for any student
Presentations and Movies		weekly
Sheets and Sketches		weekly
Researches and reports		Week (2,3)
the Projects		Week (4,8)
Practical modelling		Week (4,8)
Attendance		weekly

Mid-term exam		Week (8)	
final exam		Week (16)	

c- Grading system

quizes	Quiz (1)	(5) marks	
	Quiz (2)	(5) marks	
Discussions	15%		
Sheets and Sketches	20%		
Researches and reports	20%	5 marks	(40) marks
the Projects	30%		
Practical modelling	20%		
Attendance		(10) marks	
Mid-term exam		(15) marks	
final exam			(60) marks
Total			(100) marks

10- List of references:

a) Course notes	Lecture notes and handouts
b) Required books	1. Allan V. Oppenheim, Signals and Systems 2nd Edition 2. John G. Porkies, Digital Signal Processing: Principles, Algorithms and Applications, 5th Edition 3. Schaum's, ‘ Signals and Systems, 4th Edition’.
c) Recommend books	Mentioned at time.
d) Periodicals, Web sites, etc	No periodicals are needed.

11- Facilities required for teaching and learning:

- Appropriate teaching design studios including presentation board, data show
- Google classroom
- E- learning

12- Requirements for Disable facilities:

- On line teaching hours if it is needed
- Extra examples and topic-specified research

Course coordinator:	Ass.Prof. Dr. Ashraf Mohamed Ali Hassan
program Coordinator	Dr. Ehab Mohamed Nabil Ismail Abdel Rasoul
Head of the Department	Dr. Ibrahim Ali Mahmoud Abdel Dayem
Date:	٢٠٢٣/٢٠٢٤

Ministry of higher education
High valley institute for engineering and technology
Electrical power engineering program

Course specification

Course code:	Course name
CECE 204	Computer Organization

A- Affiliation

Relevant program:	Control and computer system engineering
Department offering the program:	Electrical and communication engineering
Department offering the course:	Electrical and communication engineering
Date of program operation:	2008-2009
Date of approval from the higher ministry of education	27/1/2008
Date of course operation	٢٠٢٣-٢٠٢٤

B- Basic Information

Course Name	Computer Organization
Code	CECE 204
Course Level	Third level courses (Junior) - First semester (Fall)
Credit Hours	3Cr. hr
Lectures	2hr
lab	3hr
Total	5hr
Prerequisite	CECE 102
Instructor name/Email	Dr. Mohamed Mahmoud Ahmed Mohamed El-Ghoboushi Mohammed.ghaboushy@sva.edu.eg

C- Professional information

1- Course core

Description of a hypothetical computer system, the CPU main memory, I/O subsystem, and all related components. In-depth discussion of the architecture of the Intel 80x86 based microprocessors and of available assemblers, linkers, library managers and debugging tools. Macro assembler programming techniques involve building, incorporating and maintaining libraries, and using assembler pseudo-ops and directives. Debugging and testing techniques. Interfacing a high-level language with an assembly language. Chip level programming of microprocessor type systems. Topics covered include I/O ports, I/O devices and controllers, DMA channels, priority interrupts

2 Course learning objectives:

oc 1	explain the computer Evolution and Performance.
oc 2	explain the computer interconnection structures.
oc 3	Recognize the study for the Organization and Architecture
oc 4	Recognize the study for Computer arithmetic and Instruction sets memories.
oc 5	Recognize for the CPU structure and function.
oc6	Recognize the study for the Cache memory, Interrupt and Short and long I/O Wait Interrupt

3-Learning outcomes of the course (LOs)

Upon the completion of the course, the student should be able to:

a. Cognitive Domains (LOs):

LO1	Recognize the Organization and Architecture and Computer Evolution and Performance.
LO2	Recognize the Computer interconnection structures Internal memory.
LO3	Recognize the External memory and Input / output and Computer arithmetic and Instruction sets.

b. Psychomotor Domains (LOs):

LO4	Prepare the CPU structure and function.
LO5	Conduct and develop with Cache memory and Interrupt.

c. Affective Domains (LOs):

LO6	Communicate Effectively with Short and long I/O Wait Interrupt.

4- Program LOs served by the course:

Upon the completion of the Program the student should be able to:

Lo9.	Identify the standard Software Engineering practices and strategies in real-time software project development using an open-source programming environment or commercial environment to deliver quality products for the organization's success
Lo27.	Design and develop computer programs/computer-based systems in the areas related to algorithms, networking, web design, cloud computing, IoT and data analytics of varying complexity.
Lo37.	Acquaint with the contemporary trends in industrial/research settings and thereby innovate novel solutions to existing problems.

2- The relation between the course learning outcomes and the the program LOs

Course (LOs)		program LOs	
LO1	Recognize the Organization and Architecture and Computer Evolution and Performance.	**Lo9.**	Identify the standard Software Engineering practices and strategies in real-time software project development using an open-source programming environment or commercial environment to deliver quality products for the organization's success
LO2	Recognize the Computer interconnection structures Internal memory.	**Lo9.**	Identify the standard Software Engineering practices and strategies in real-time software project development using an open-source programming environment or commercial environment to deliver quality products for the organization's success
LO3	Recognize the External memory and Input / output and Computer arithmetic and Instruction sets.	**Lo9.**	Identify the standard Software Engineering practices and strategies in real-time software project development using an open-source programming environment or commercial

			environment to deliver quality products for the organization's success
LO4	Prepare the CPU structure and function.	**Lo27.**	Design and develop computer programs/computer-based systems in the areas related to algorithms, networking, web design, cloud computing, IoT and data analytics of varying complexity.
LO5	Conduct and develop with Cache memory and Interrupt.	**Lo27.**	Design and develop computer programs/computer-based systems in the areas related to algorithms, networking, web design, cloud computing, IoT and data analytics of varying complexity.
LO6	Communicate Effectively with Short and long I/O Wait Interrupt.	**Lo37.**	Acquaint with the contemporary trends in industrial/research settings and thereby innovate novel solutions to existing problems.

3- Course content and the relation between the course contents and the course LOs

Week No.	Topic	Lecture hr.	Tutorial hr.	Practical hours	course LOs
1	Organization and Architecture	2	0	2	LO1
2	Computer evolution and performance	2	0	2	LO1
3	Internal memory	2	0	2	LO2
4	External memory	2	0	2	LO3
5	Input/output	2	0	2	LO3
6	Computer arithmetic and instruction sets	2	0	2	LO3
7	CPU structure and function	2	0	2	LO4
8	Mid-term Exam		2.0		
9	Cache memory	2	0	2	LO5
10	Interrupt	2	0	2	LO5
11	Interrupt types	2	0	2	LO5
12	Input/output programs	2	0	2	LO6
13	Short and long I/O wait interrupts	2	0	2	LO6
14	Input/output programs - Interrupt types	2	0	2	LO6
15	Short and long I/O wait interrupts	2	0	2	LO6
16	Final Exam		2.0		

Total hours	28	0	28	--

4- The Teaching and learning methods and their relation to the Los of the course

Course learning Outcomes (LOs)	Teaching and Learning Methods												
	On line / face to face lectures	Tutorials: sheets/ sketches	projects	Problem solving	Brain storming	Practical: lab	Discovering / self learning	Site visit	Reports/ researches	Cooperative work	presentation	Discussion	modelling
LO1	✓												
LO2	✓	✓											
LO3	✓	✓	✓	✓	✓		✓		✓	✓			✓
LO4	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓
LO5	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓
LO6	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓

Notes:

The research concerns the cooperative work, the discussion, the site visit and the presentations.
The Tutorials concerns the brain storming and the problem solving.
Online lectures used as hybrid learning, but in case of totally on-line learning all the used teaching and learning methods will be on line.

5- Student assessment method

a- Assessment method and its relation to the Los of the course

Course ILOs	Tools of assessment										
	quizzes	Mid -term exam	Final exam	sheets/ sketches	projects	Practical: lab	Oral exam	discussions	Reports/ researches	presentation	modelling
LO1											
LO2											
LO3	✓	✓	✓	✓	✓		✓		✓		✓
LO4	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
LO5	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
LO6	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓

b- Time schedule of assessment

Quizzes	Quiz (1)	Week (3)
	Quiz (2)	Week (10)
Discussions		Every week for any student
Presentations and Movies		weekly
Sheets and Sketches		weekly

Researches and reports	Week (2,3)
the Projects	Week (4,8)
Practical modelling	Week (4,8)
Attendance	weekly
Mid-term exam	Week (7)
final exam	Week (14)

c- Grading system

quizes	Quiz (1)	(5) marks	
	Quiz (2)	(5) marks	
Discussions	15%		
Sheets and Sketches	20%		
Researches and reports	20%	5 marks	(40) marks
the Projects	30%		
Practical modelling	20%		
Attendance		(10) marks	
Mid-term exam		(15) marks	
final exam			(60) marks
Total			(100) marks

10- List of references:

a)	Course notes	Lecture notes and handouts
b)	Required books	W. Stalling, "Computer Organization and Architecture", 15 ed., McGraw-Hill.
c)	Recommend books	D. Patterson and J. Hennessy, "Computer Organization & Design interface", McGraw-Hill, 4th
d)	Periodicals, Web sites, etc	No periodicals are needed.

11- Facilities required for teaching and learning:

- Appropriate teaching design studios including presentation board, data show
- Google classroom
- E- learning

12- Requirements for Disable facilities:

- On line teaching hours if it is needed
- Extra examples and topic-specified research

Course coordinator:	Dr. Mohamed Mahmoud Ahmed Mohamed El-Ghoboushi
program Coordinator	Dr. Ehab Mohamed Nabil Ismail Abdel Rasoul
Head of the Department	Dr. Ibrahim Ali Mahmoud Abdel Dayem
Date:	٢٠٢٣/٢٠٢٤

Ministry of higher education
High valley institute for engineering and technology
Electrical power engineering program

Course specification

Course code:	Course name
BASE 402	Feasibility Studies
A- Affiliation	
Relevant program:	Electrical power engineering
Department offering the program:	Electrical and communication engineering
Department offering the course:	Electrical and communication engineering
Date of program operation:	2008-2009
Date of approval from the higher ministry of education	27/1/2008
Date of course operation	202٣-202٤

B- Basic Information

Course Name	Feasibility Studies
Code	BASE 402
Course Level	Third level courses (Junior) - First semester (Fall)
Credit Hours	3Cr. hr
Lectures	2hr
Tutorial	2hr
Total	4hr
Prerequisite	-
Instructor name/Email	Dr. Mohamed Mahmoud Badawy Mohammed.ghaboushy@sva.edu.eg

C- Professional information

1- Course core

This course introduces students to the meaning, importance, and effects of feasibility study. It also deals with the analysis of decision problems under uncertainty, partial information, risk and competition. Considers the analytic hierarchy process outranking procedures and multi-attribute utility theory.

2- Course learning objectives:

oc 1	Recognize the importance of feasibility studies for projects.
oc 2	Recognize the definition of feasibility study and historical development of interest.
oc 3	Recognize with feasibility studies and their components.
oc 4	identify the most important financing aspects in the feasibility study: sources of financing, how to calculate their cost, and criteria for choosing the best sources.
oc 5	Recognize on making feasibility study evaluation for projects
oc 6	Recognize Feasibility study evaluation methods.

3- Learning outcomes of the course (LOs)

Upon the completion of the course, the student should be able to:

a. Cognitive Domains (LOs):

LO1	Identify the nature of the project, its components and forms.
LO2	Recognize the preliminary feasibility studies and their components.
LO3	Recognize the effects of environmental feasibility studies.

b. Psychomotor Domains (LOs):

LO4	Use tools to produce the effect of social feasibility study on mega projects.
LO5	Utilize feasibility study evaluation methods to making feasibility reports
LO6	prepare cash flow diagrams for projects and studying its effects on the feasibility of projects.

c. Affective Domains (LOs):

-	None

4- Program LOs served by the course:

Upon the completion of the Program the student should be able to:

Lo7.	State the factors affecting the engineering projects.
Lo8.	Define the fundamentals of engineering management.
Lo22.	Apply engineering design processes to produce cost-effective solutions that meet specified needs.
Lo25.	Plan, supervise and monitor implementation of engineering projects.

4- The relation between the course learning outcomes and the program LOs

	Course (LOs)	program LOs	
LO1	Identify the nature of the project, its components and forms.	**Lo7.**	State the factors affecting the engineering projects.
LO2	Recognize the preliminary feasibility studies and their components.	**Lo8.**	Define the fundamentals of engineering management.
LO3	Use tools to produce the effect of social feasibility study on mega projects.	**Lo8.**	Define the fundamentals of engineering management.

LO4	Utilize feasibility study evaluation methods to making feasibility reports	**Lo22.**	Apply engineering design processes to produce cost-effective solutions that meet specified needs.
LO5	prepare cash flow diagrams for projects and studying its effects on the feasibility of projects.	**Lo25.**	Plan, supervise and monitor implementation of engineering projects.
LO6	Use tools to produce the effect of social feasibility study on mega projects.	**Lo25.**	Plan, supervise and monitor implementation of engineering projects.

5- Course content and the relation between the course contents and the course LOs

Week No.	Topic	Lecture hr.	Tutorial hr.	Practical hours	course LOs
1	The importance of feasibility studies for projects.	2	2	0	LO1
2	Definition of feasibility study and historical development of interest.	2	2	0	LO2,LO3
3	The nature of the project, its components and forms.	2	2	0	LO2,LO3
4	Preliminary feasibility studies and their components.	2	2	0	LO1,LO6
5	Environmental feasibility studies + Quiz (1)	2	2	0	LO1,LO2,LO3
6	Environmental feasibility studies.	2	2	0	LO2
7	Making cash flow diagram for construction projects				LO6
8	Midterm		1.0		
9	A social feasibility study design criterion.	2	2	0	LO2
10	The most important financing aspects in the feasibility study: sources of financing, how to calculate their cost, and criteria for choosing the best sources.	2	2	0	LO2
11	The most important financing aspects in the feasibility study: preparing financial statements, financial obligations on	2	2	0	LO4,LO5

	the project, and financial incentives for projects				
12	Technical and engineering feasibility of the project	2	2	0	LO4,LO5
13	Feasibility study evaluation methods. + Quiz (2)	2	2	0	LO3:6
14	Feasibility study evaluation methods.	2	2	0	LO2
15	Revision				LO1:6
16	Final Exam		2.0		
Total hours		28	28	0	--

1- The Teaching and Learning Methods and their relation to the Los of the course

Course LOs	On line / face to face lectures	Tutorials: sheets/ sketches	projects	Problem solving	Brain storming	Practical: lab Discovering / self learning	Site visit	Reports/ researches	Cooperative work	presentation	Discussion	modeling
	Teaching and Learning Methods											
LO1	√	√	√	√				√	√	√		
LO2	√	√	√	√	√			√		√	√	√
LO3	√	√	√	√	√			√		√	√	
LO4	√	√	√	√				√	√	√		
LO5	√	√	√	√	√			√		√	√	√
LO6	√		√						√			

Notes:

- The research concerns the cooperative work, the discussion, and the presentations.
- The Tutorials concerns the brain storming and the problem solving.
- Online lectures used as hybrid learning, but in case of totally online learning all the used teaching and learning methods will be on line.

2- Student assessment method

a- Assessment method and its relation to the Los of the course

b- Tools of assessment

Course LOs	quizzes	Mid -term exam	Final exam	sheets/ sketches	projects	Practical: lab	Oral exam	discussions	Reports/ researches	presentation	modeling
LO1	√	√	√	√	√				√		
LO2	√	√	√	√	√			√	√	√	√

LO3	√		√	√	√		√	√	√	
LO4	√	√	√	√	√			√		
LO5	√		√	√	√		√	√	√	√
LO6	√	√	√		√					

c- Time schedule of assessment

Quizzes	Week (5,13)
Discussions	weekly
Sheets and sketches	Week (7-10-13- 15)
Researches and reports	Week (14)
Attendance	weekly
Mid- term exam	Week (8)
final submission	Week (16)

d- Grading system

Quizzes	Quiz (1) Quiz (2)	(10) marks (10) marks	
Sheets and Sketches	(50) %		
Reports	(10) %	(°) marks	(30) marks
Discussion/	(40) %		
Attendance		(5) marks	
Mid- term exam			20 marks
final exam			50 marks
total			100 marks

10- List of references:

a)	Course notes	The importance of feasibility studies for projects , The conceptual estimation report , Time adjustment , location adjustment , size adjustment and forecast cost estimation .
b)	Required books	Project evaluation and feasibility analysis by Kevin baker. Financial feasibility studies for property development theory and practice TIMHAVARD.
c)	Recommend books	Feasibility study, project management, professional pm wiring note book
d)	Periodicals, Web sites, etc	https://www.researchgate.net/publication/341134813_A_PRACTICAL_GUIDE_TO_WRITING_A_FEASIBILITY_STUDY

11- Facilities required for teaching and learning:

- Appropriate teaching design studios including presentation board, data show
- Google classroom
- E- learning

12- Requirements for Disable facilities:

- On line teaching hours if it is needed
- Extra assignments

Ministry of higher education
High valley institute for engineering and technology
Electrical power engineering program

Course coordinator:	Dr. Mohamed Mahmoud Badawy
program Coordinator	Dr. Ehab Mohamed Nabil Ismail Abdel Rasoul
Head of the Department	Dr. Ibrahim Ali Mahmoud Abdel Dayem
Date:	٢٠٢٣/٢٠٢٤

Ministry of higher education
High valley institute for engineering and technology
Electrical power engineering program

Course specification

Course code:	Course name
MATH301	Probability & Statistics
	A- Affiliation
Relevant program:	Electrical power engineering
Department offering the program:	Electrical and communication engineering
Department offering the course:	Electrical and communication engineering
Date of program operation:	2008-2009
Date of approval from the higher ministry of education	27/1/2008
Date of course operation	202٣-202٤

B- Basic Information

Course Name	Probability & Statistics
Code	MATH301
Course Level	Third level courses (Junior) - First semester (Fall)
Credit Hours	3Cr. hr
Lectures	2hr
Tutorial	2hr
Total	4hr
Prerequisite	MATH 102
Instructor name/Email	Dr. Gamal El-Anani gamalanany@sva.edu.eg

C- Professional information

1- Course core

The course introduces students to some important statistical concepts and techniques that are of common application in engineering. Covers graphical and numerical summaries of data, plotting data, probabilities of random events, random variables, properties of density and distribution functions, measures of location and dispersion, expected values, independence of random variables, scaling and adding random variables, the binomial Poisson and normal distributions, the central limit theorem, hypothesis testing, confidence intervals, t test, paired t test, standard errors, least squares, residuals, correlation, examples of regression, quality control, clustering of rare events.

2- Course learning objectives:

oc 1	Recognize some important statistical
oc 2	Recognize graphical and numerical summaries of data.
oc 3	used to apply knowledge of mathematics to distribution functions, measures
oc 4	Recognize the concepts of expected values
oc 5	Describe and analyze data, to Deal with design situations within solving design problems based on the analytical process for the central limit theorem, hypothesis testing

oc 6	Explain the methodologies of solving engineering problems with correlation, examples of regression, quality control,
oc 7	apply knowledge of Theory of equations, and clustering of rare events. to solve engineering problems.

3- Learning outcomes of the course (LOs)

Upon the completion of the course, the student should be able to:

a. Cognitive Domains (LOs):

LO1	Explain concepts and theories of mathematics and sciences, appropriate to Probability & Statistics
LO2	Demonstrate methodologies of solving engineering problems, data collection and interpretation
LO3	Select appropriate solutions for engineering problems based on analytical thinking

b. Psychomotor Domains (LOs):

LO4	Apply knowledge of mathematics to solve engineering problems.
LO5	Apply knowledge of linear algebraic equations, iterative methods, and infinite series to solve engineering problems and prepare and present technical reports about application of matrices to solve engineering problems.
LO6	Solve the tutorial classroom with the demonstrator and effectively manages tasks, time, and resources, when solving mathematics problems, and in exams.
LO7	Apply knowledge of mathematics to solve differential problems

c- Affective Domains (LOs)

-	None

4- Program LOs served by the course:

Upon the completion of the Program the student should be able to:

Lo1.	Identify, formulate basic science and mathematics.
Lo2.	Simulate, analyze and interpret data.
Lo34.	Use creative, innovative and flexible thinking.

5- The relation between the course learning outcomes and the program LOs

Course (LOs)		program LOs	
LO1	Explain concepts and theories of mathematics and sciences, appropriate to Probability & Statistics	**Lo1.**	Identify, formulate basic science and mathematics.
LO2	Demonstrate methodologies of solving engineering problems, data collection and interpretation	**Lo2.**	Simulate, analyze and interpret data.

LO3	Select appropriate solutions for engineering problems based on analytical thinking	**Lo17.**	Solve complex engineering problems.
LO4	Apply knowledge of mathematics to solve engineering problems.	**Lo18.**	Apply engineering fundamentals, basic science and mathematics.
LO5	Apply knowledge of linear algebraic equations, iterative methods, and infinite series to solve engineering problems and prepare and present technical reports about application of matrices to solve engineering problems.	**Lo18.**	Apply engineering fundamentals, basic science and mathematics.
LO6	Solve the tutorial classroom with the demonstrator and effectively manages tasks, time, and resources, when solving mathematics problems, and in exams.	**Lo18.**	Apply engineering fundamentals, basic science and mathematics.
LO7	Apply knowledge of mathematics to solve differential problems	**Lo18.**	Apply engineering fundamentals, basic science and mathematics.

4- Course content and the relation between the course contents and the course LOs

Week No.	Topic	Lecture hr.	Tutorial hr.	Practical hours	course LOs
1	The course introduces students to some important statistical concepts.	2	2	0	LO1,LO2
2	Techniques that are of common application in engineering.	2	2	0	LO1,LO3
3	Covers graphical and numerical summaries of data.	2	2	0	LO1,LO4
4	Plotting data, probabilities of random events.	2	2	C(2.1)	LO2,LO4
5	Random variables, properties of density and distribution functions	2	2	0	LO2,LO4

6	Measures of location and dispersion	2	2	0	LO2,LO4
7	Expected values, independence of random variables				LO4
8	Midterm	1.0			
9	Scaling and adding random variables, the binomial Poisson, and normal distributions	2	2	0	LO2,LO4
10	The central limit theorem, hypothesis testing, confidence intervals	2	2	0	LO2,LO4
11	Test, paired t test, standard errors,	2	2	0	LO2,LO5
12	Least squares, residuals	2	2	0	LO2,LO4
13	Correlation, examples of regression, quality control,	2	2	0	LO2,LO4
14	Clustering of rare events.	2	2	0	LO2,LO4
15	Revision				LO1,LO2,LO5
16	Final Exam	2.0			
Total hours		28	28	0	--

5- The Teaching and learning methods and their relation to the Los of the course

Course learning Outcomes (LOs)	Teaching and Learning Methods												
	On line / face to face lectures	Tutorials: sheets/ sketches	projects	Problem solving	Brain storming	Practical: lab	Discovering / Self learning	Site visit	Reports/ researches	Cooperative work	presentation	Discussion	modelling
LO1	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	
LO2	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	
LO3	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	
LO4	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	
LO4	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	
LO5	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	
LO6	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	

Notes:

The research concerns the cooperative work, the discussion and the presentations.

The Tutorials concerns the brain storming and the problem solving.

Online lectures used as hybrid learning, but in case of totally on-line learning all the used teaching and learning methods will be on line.

6- Student assessment method

a- Assessment method and its relation to the Los of the course

Course ILOs	Tools of assessment										
	quizzes	Mid -term exam	Final exam	sheets/ sketches	projects	Practical: lab	Oral exam	discussions	Reports/ researches	presentation	modelling
LO1	✓	✓	✓	✓				✓	✓	✓	
LO2	✓	✓	✓	✓				✓	✓	✓	
LO3	✓	✓	✓	✓				✓	✓	✓	
LO4	✓	✓	✓	✓				✓	✓	✓	
LO4	✓	✓	✓	✓				✓	✓	✓	
LO5	✓	✓	✓	✓				✓	✓	✓	
LO6	✓	✓	✓	✓				✓	✓	✓	

b- Time schedule of assessment

Quizzes	Quiz (1)	Week (3)
	Quiz (2)	Week (10)
Discussions		Every week for any student
Presentations and Movies		weekly
Sheets and Sketches		weekly
Researches and reports		Week (2,3)
Attendance		weekly
Mid-term exam		Week (7)
final exam		Week (14)

c- Grading system

quizes	Quiz (1)	(5) marks	
	Quiz (2)	(5) marks	
Discussions	25%		
Sheets and Sketches	50%	10 marks	(50) marks
Researches and reports	25%		
Attendance		(10) marks	
Mid-term exam		(20) marks	
final exam			(50) marks
Total			(100) marks

10- List of references:

a) Course notes
Lecture notes and handouts

b) Required books
Mendenhall, W., Introduction to Probability and Statistics, Boston: Duxbury Press, 10thEd., 1999.

c) Recommend books
- Barry C. Arnold, N. Balakrishnan, H.N. Nag raja, A First Course in Order Statistic, John Wiley& Sons.

d) Periodicals, Web sites, etc	▪ Kevin R.M Murphy, Brett Myers, Statistical Power Analysis, A Simple and General Model for Traditional and Modern Hypothesis Tests, Lawrence Erlbaum Associates,5th Ed. ▪ Rosencrantz, W., Introduction to Probability and Statistics for Scientists and Engineers. ▪ Ross S., A First Course in Probability Englewood Cliffs, NJ: Prentice Hall, 7th Ed. ▪ Rozanov, Y.A., Probability Theory: A Concise Course, New York: Dover. ▪ Terrell, G., Mathematical Statistics:A Unified Introduction,2nd edition. Web Sites related to Mathematics and Mathematical engineering as: www.math.hmc.edu, www.tutorial.math.lamar.edu, www.web.mit.edu

11- Facilities required for teaching and learning:

- Appropriate teaching design studios including presentation board, data show
- Google classroom
- E- learning

12- Requirements for Disable facilities:

- On line teaching hours if it is needed
- Extra examples and topic-specified research

Course coordinator:	Dr. Gamal El Anani
program Coordinator	Dr. Ehab Mohamed Nabil Ismail Abdel Rasoul
Head of the Department	Dr. Ibrahim Ali Mahmoud Abdel Dayem
Date:	٢٠٢٣/٢٠٢٤

Third level courses (Junior) - Second semester (Spring)

No.	Cod	Course Name	Instructor
1	CECE 305	Automatic Control	Dr. Ehab Mohamed Nabil Ismail Abdel Rasoul
2	CECE 315	Control Lab	Dr. Ehab Mohamed Nabil Ismail Abdel Rasoul
3	CECE 302	Electronics II	Dr. Ibrahim Ali Mahmoud Abdel Dayem
4	CECE 312	Electronics Lab	Dr. Ibrahim Ali Mahmoud Abdel Dayem
5	CECE 306	Electromagnetic Theory	Prof. Dr. Hussein Hamed Al-Ghaz
6	CECE 325	Fundamentals of Communication I	Ass. Prof. Dr. Ashraf Mohamed Ali Hassan
7	CECE 326	Communication Lab	Ass. Prof. Dr. Ashraf Mohamed Ali Hassan
8	MATH 302	Linear Algebra and Matrices	Dr. Gamal El-Anani

Ministry of higher education
High valley institute for engineering and technology
Electrical power engineering program

Course specification

Course code:	Course name
CECE 305	Automatic Control
A- Affiliation	
Relevant program:	Electrical power engineering
Department offering the program:	Electrical and communication engineering
Department offering the course:	Electrical and communication engineering
Date of program operation:	2008-2009
Date of approval from the higher ministry of education	27/1/2008
Date of course operation	202٣-202٤

B- Basic Information

Course Name	Automatic Control
Code	CECE 305
Course Level	Third level courses (Junior) - Second semester (Spring)
Credit Hours	3Cr. Hr
Lectures	2hr
Tutorial	2hr
Total	4hr
Prerequisite	CECE 203
Instructor name/Email	Dr. Ehab Mohamed Nabil Ismail Abdel Rasoul ihab.nabil@sva.edu.eg

C- Professional information

1- Course core

Principles of closed-loop feedback control systems, block diagrams, signal graphs, state variable to solution of free and forced response of linear systems, general feedback theory, transfer functions of components, Eigenvalue problems, criteria for designs, systems study in the domains, Nyquist criterion, Routh criterion, root locus theory and compensation methods. Design of Feedback Control Systems.

2- Course learning objectives:

D	Recognize the State-space modelling and analysis.
oc 2	Recognize the Automatic controllability, and observability
oc 3	Recognize the state feedback design and pole placement
oc 4	Recognize the ways of implementation control system techniques.

3- Learning outcomes of the course (LOs)

Upon the completion of the course, the student should be able to:

a. Cognitive Domains (LOs):

LO1	Recognize the the control system and its components.

LO2	Recognize the Automatic State-space modelling and analysis
LO3	Recognize the open loop, closed control system, state feedback design and pole placement
LO4	Recognize the Design and operation of understanding the ways of implementation control system techniques.
b. Psychomotor Domains (LOs):	
LO5	Use tools the Convert the controlled closed loop in simplest form.
c. Affective Domains (LOs):	
-	None

4- Program LOs served by the course:

Upon the completion of the Program the student should be able to:

Lo11.	Principles of for electrical equipment and systems.
Lo12.	Principles of operation and performance specifications of electrical and electromechanical engineering systems .
Lo19.	Solve complex engineering problems and solve problems in the field of electrical and electrical power engineering.
Lo29.	Utilize computer program to analyze design problems and interpret numerical data and test and examine components, equipment and systems of electrical and electric power generation, control, and distribution systems.

5- The relation between the course learning outcomes and the program LOs

	Course (LOs)		**program LOs**
LO1	Recognize the the control system and its components.	**Lo11.**	Principles of for electrical equipment and systems.
LO2	Recognize the Automatic State-space modelling and analysis	**Lo12.**	Principles of operation and performance specifications of electrical and electromechanical engineering systems .
LO3	Recognize the open loop, closed control system, state feedback design and pole placement	**Lo19.**	Solve complex engineering problems and solve problems in the field of electrical and electrical power engineering.

LO4	Recognize the Design and operation of understanding the ways of implementation control system techniques.	**Lo19.**	Solve complex engineering problems and solve problems in the field of electrical and electrical power engineering.
LO5	Use tools the Convert the controlled closed loop in simplest form.	**Lo29.**	Utilize computer program to analyze design problems and interpret numerical data and test and examine components, equipment and systems of electrical and electric power generation, control, and distribution systems.

4- Course content and the relation between the course contents and the course LOs

Week No.	Topic	Lecture hr.	Tutorial hr.	Practical hours	course LOs
1	Introduction: component of control system	2	2	0	LO1
2	State-space modelling and analysis	2	2	0	LO1
3	Focuses on Automatic Controllability + Solved examples+ Quiz (1).	2	2	0	LO1
4	Quiz (1) +Automatic Observability.	2	2	0	LO5
5	Focuses on state feedback design + solved examples.	2	2	0	LO2
6	Focuses on Pole placement.	2	2	0	LO2
7	Dynamic observers.				LO2
8	Midterm		1.0		
9	Focuses on Static characteristic for controlled system	2	2	0	LO5
10	The principle of open loop control system	2	2	0	LO3
11	Focuses on Output feedback design.	2	2	0	LO4
12	Quiz (2)	2	2	0	LO3
13	Focuses on Stability Analysis	2	2	0	LO4
14	Focuses on Special Topics.	2	2	0	LO4
15	Focuses on solved examples in controlled system .				LO2
16	Final Exam		2.0		
Total hours		28	28	0	--

5- The Teaching and learning methods and their relation to the Los of the course

	Teaching and Learning Methods

Course learning Outcomes (LOs)	Online / face to face	Tutorials: sheets/ sketches	Projects	Problem solving	Brain storming	Practical: lab	Discovering / Self Site visit	Reports/ researches	Cooperative work	presentation	Discussion	modelling
LO1												
LO5		✓										
LO2		✓	✓	✓	✓		✓	✓	✓			✓
LO3		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
LO4		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓

Notes:

The research concerns the cooperative work, the discussion, the site visit and the presentations.
The Tutorials concerns the brain storming and the problem solving.
Online lectures used as hybrid learning, but in case of totally on-line learning all the used teaching and learning methods will be online.

6- Student assessment method

a- Assessment method and its relation to the Los of the course

Course ILOs	Tools of assessment										
	quizzes	Mid -term exam	Final exam	sheets/ sketches	projects	Practical: lab	Oral exam	discussions	Reports/ researches	presentation	modelling
LO1											
LO5											
LO2	✓	✓	✓	✓	✓		✓		✓		✓
LO3	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
LO4	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓

b- Time schedule of assessment

Quizzes	Quiz (1)	Week (3)
	Quiz (2)	Week (10)
Discussions		Every week for any student
Presentations and Movies		Weekly
Sheets and Sketches		Weekly
Researches and reports		Week (2,3)
the Projects		Week (4,8)
Practical modelling		Week (4,8)
Attendance		Weekly
Mid-term exam		Week (8)
final exam		Week (16)

c- Grading system			
quizes	Quiz (1) Quiz (2)	(5) marks (5) marks	
Discussions	15%		
Sheets and Sketches	20%		
Researches and reports	20%	5 marks	(40) marks
the Projects	30%		
Practical modelling	20%		
Attendance		(10) marks	
Mid-term exam		(15) marks	
final exam			(60) marks
Total			(100) marks

10- List of references:

a) Course notes	Lecture notes and handouts
b) Required books	▪ Nise, N.S. ", John Wiley & Sons Ltd, "Control systems engineering., UK, 2020. ▪ Katsuhiko Ogata, "Modern Control Engineering", Prentice Hall, 5th Edition, 2009. ▪ F. Golnaraghi and B. C. Kuo, "Automatic control Systems", 10th ed., John Wiley & Sons, Inc. 2017. ▪ Andrea Bacciotti, "Stability and Control of Linear Systems", Volume 185, Springer, 2019
c) Recommend books	R. C. Dorf and R. H. Bishop, "Modern Control Systems", Addison-Wesley, 11th Edition, 2014.
d) Periodicals, Web sites, etc	No periodicals are needed.

11- Facilities required for teaching and learning:

- Appropriate teaching design studios including presentation board, data show
- Google classroom
- E- learning

12- Requirements for Disable facilities:

- On line teaching hours if it is needed
- Extra examples and topic-specified research

Course coordinator:	Dr. Ehab Mohamed Nabil Ismail Abdel Rasoul
program Coordinator	Dr. Ehab Mohamed Nabil Ismail Abdel Rasoul
Head of the Department	Dr. Ibrahim Ali Mahmoud Abdel Dayem
Date:	٢٠٢٣/٢٠٢٤

Ministry of higher education
High valley institute for engineering and technology
Electrical power engineering program

Course specification

Course code:	Course name
CECE315	Automatic Control Lab

A- Affiliation

Relevant program:	Electrical power engineering
Department offering the program:	Electrical and communication engineering
Department offering the course:	Electrical and communication engineering
Date of program operation:	2008-2009
Date of approval from the higher ministry of education	27/1/2008
Date of course operation	202٣-202٤

B- Basic Information

Course Name	Control Lab
Code	CECE315
Course Level	Third level courses (Junior) - Second semester (Spring)
Credit Hours	1Cr. Hr
Lectures	0hr
lab	3hr
Total	3hr
Prerequisite	Con CECE 302
Instructor name/Email	Dr. Ehab Mohamed Nabil Ismail Abdel Rasoul ihab.nabil@sva.edu.eg

C- Professional information

1- Course core

Several experiments are conducted in the Control Lab to illustrate material covered in the course

2- Course learning objectives:

oc 1	Recognize the control system and its components.
oc 2	Recognize the control Automatic temperature control using a two-position controller with and without hysteresis
oc 3	Recognize the principle of open loop and closed control system
oc 4	Recognize the control with design and operation of p-action controller , and Static characteristic for controlled system.

3- Learning outcomes of the course (LOs)

Upon the completion of the course, the student should be able to:

a. Cognitive Domains (LOs):

	none

b. Psychomotor Domains (LOs):

LO1	Prepare the control system and its components.

LO2	Apply acknowledge with Automatic temperature control using a two-position controller with and without hysteresis.
LO3	Prepare the open loop and closed control system
LO4	Prepare, Design, and operation of p-action controller, and Static characteristic for controlled system.

c. Affective Domains (LOs):

LO5	Communicate effectively with controlled closed loop in simplest form.

4- Program competencies served by the course:

Upon the completion of the Program the student should be able to:

Lo29.	Utilize computer program to analyze design problems and interpret numerical data and test and examine components, equipment and systems of electrical and electric power generation, control, and distribution systems.
Lo39.	Show accuracy while Designing experiments, as well as analyzing and interpreting experimental results related to electrical and electrical power systems.

5- The relation between the course learning outcomes and the program competencies

Course (LOs)		program competencies	
LO1	Prepare the control system and its components.	**Lo29.**	Utilize computer program to analyze design problems and interpret numerical data and test and examine components, equipment and systems of electrical and electric power generation, control, and distribution systems.
LO2	Apply acknowledge with Automatic temperature control using a two-position controller with and without hysteresis.	**Lo29.**	Utilize computer program to analyze design problems and interpret numerical data and test and examine components, equipment and systems of electrical and electric power generation, control, and distribution systems.
LO3	Prepare the open loop and closed control system	**Lo29.**	Utilize computer program to analyze design problems and interpret numerical data and test and examine components, equipment and systems of electrical and electric power generation, control, and distribution systems.
LO4	Prepare, Design, and operation of p-action controller, and Static characteristic for controlled system.	**Lo29.**	Utilize computer program to analyze design problems and interpret numerical data and test and examine components, equipment and systems of electrical and electric power generation, control, and distribution systems.

LO5	Communicate effectively with controlled closed loop in simplest form.	**Lo39.**	Show accuracy while Designing experiments, as well as analyzing and interpreting experimental results related to electrical and electrical power systems.

6- Course content and the relation between the course contents and the course LOs

Week No.	Topic	Lecture hr.	Tutorial hr.	Practical hours	course LOs
1	Introduction: component of control system	0	0	2	LO1
2	Parameter for temperature-controlled system	0	0	2	LO1
3	Focuses on Automatic temperature control of sauna + Solved examples.	0	0	2	LO1
4	Automatic temperature control using a two-position controller with hysteresis.	0	0	2	LO5
5	Focuses on Calibration of temperature sensor + solved examples.	0	0	2	LO2
6	Focuses on Two position (2-state) controller without hysteresis.	0	0	2	LO2
7	Disturbance response for a two-position controller.	0	0	2	LO2
8	Midterm		1.0		
9	Focuses on Static characteristic for controlled system	0	0	2	LO5
10	The principle of open loop control system	0	0	2	LO2
11	Focuses on Design and operation of p-action controller.	0	0	2	LO5
12	Focuses on Design and operation of p-action controller.	0	0	2	LO3
13	Focuses on project objective	0	0	2	LO4
14	Focuses on Special Topics.	0	0	2	LO4
15	Focuses on solved examples in controlled system.	0	0	2	LO4
16	Final Exam		2.0		
Total hours		0	0	28	--

7- The Teaching and learning methods and their relation to the Los of the course

Course learning Outcomes (LOs)	Teaching and Learning Methods												
	On line / face to face lectures	Tutorials: sheets	projects	Problem solving	Brain storming	Practical: lab	Discovering / self learning	Site visit	Reports/ researches	Cooperative work	presentation	Discussion	modelling
LO1	✓	✓	✓			✓	✓			✓	✓	✓	

LO5	✓	✓	✓		✓	✓		✓	✓	✓	
LO2	✓	✓	✓		✓	✓		✓	✓	✓	
LO3	✓	✓	✓		✓	✓		✓	✓	✓	
LO4	✓	✓	✓		✓	✓		✓	✓	✓	

Notes:

The research concerns the cooperative work, the discussion and the presentations.
The Tutorials concerns on sheets
Online lectures used as hybrid learning, but in case of totally on-line learning all the used teaching and learning methods will be on line.

8- Student assessment method

a- Assessment method and its relation to the Los of the course

Course ILOs	Tools of assessment										
	quizzes	Mid -term exam	Final exam	sheets/ sketches	projects	Practical: lab	Oral exam	discussions	Reports/ researches	presentation	modelling
LO1		✓	✓	✓	✓	✓	✓	✓		✓	
LO5		✓	✓	✓	✓	✓	✓	✓		✓	
LO2		✓	✓	✓	✓	✓	✓	✓		✓	
LO3		✓	✓	✓	✓	✓	✓	✓		✓	
LO4		✓	✓	✓	✓	✓	✓	✓		✓	

b- Time schedule of assessment

Quizzes	Quiz (1) Quiz (2)	
Discussions		Every week for any student
Presentations and Movies		weekly
Sheets and Sketches		weekly
the Projects		weekly
Attendance		weekly
Mid-term exam		Week (7)
final exam		Week (14)

c- Grading system

Discussions	20%	40 marks	(60) marks
Sheets and Sketches	70%		

the Projects	10%	
Attendance	(10) marks	
Mid-term exam	(10) marks	
final exam		(40) marks
Total		(100) marks

10- List of references:

a) Course notes	Lecture notes and handouts
b) Required books	▪ Nise, N.S., John Wiley & Sons Ltd., 'Control Systems Engineering, 8th Edition'. ▪ Katsuhiko Ogata, "Modern Control Engineering", Prentice Hall, 5th Edition, 2009. ▪ F. Golnaraghi and B. C. Kuo, "Automatic control Systems", 10th ed., John Wiley & Sons, Inc. 2017. Andrea Bacciotti, "Stability and Control of Linear Systems", Volume 185, Springer, 2019
c) Recommend books	R. C. Dorf and R. H. Bishop, "Modern Control Systems", Addison-Wesley, 11th Edition, 2014.
d) Periodicals, Web sites, etc	No periodicals are needed.

11- Facilities required for teaching and learning:

- Appropriate teaching design studios including presentation board, data show
- Google classroom
- E- learning

12- Requirements for Disable facilities:

- On line teaching hours if it is needed
- Extra examples and topic-specified research

Course coordinator:	Dr. Ehab Mohamed Nabil Ismail Abdel Rasoul
program Coordinator	Dr. Ehab Mohamed Nabil Ismail Abdel Rasoul
Head of the Department	Dr. Ibrahim Ali Mahmoud Abdel Dayem
Date:	٢٠٢٣/٢٠٢٤

Ministry of higher education
High valley institute for engineering and technology
Electrical power engineering program

Course specification

Course code:	Course name
CECE 302	Electronics II
A- Affiliation	
Relevant program:	Electrical power engineering
Department offering the program:	Electrical and communication engineering
Department offering the course:	Electrical and communication engineering
Date of program operation:	2008-2009
Date of approval from the higher ministry of education	27/1/2008
Date of course operation	2022-2023

B- Basic Information

Course Name	Electronics II
Code	CECE 302
Course Level	Third level courses (Junior) - Second semester (Spring)
Credit Hours	3Cr. hr
Lectures	2hr
lab	3hr
Total	5hr
Prerequisite	CECE 301
Instructor name/Email	Dr. Ibrahim Ali Mahmoud Abdel Dayem dr.ibrahim@sva.edu.eg

C- Professional information

1-Course core

Differential amplifiers, operational amplifiers, MOSFET amplifiers; multi-stage amplifiers, output stages and power amplifiers; analog filters concepts and types, filter design, Frequency Response, Feedback, oscillator concept and types, mixers concept, types, and circuits, modulator circuits. Signal Generators and Waveform Shaping Circuits

2- Course learning objectives:

oc 1	Recognize the principles of the feedback.
oc 2	Recognize the present techniques of wave shaping and generation.
oc 3	Recognize the operation and application of differential amplifier.
oc 4	Recognize some special purpose Analog IC – like 555-timer and PLL.
oc 5	Recognize the voltage and current relationships in transmission lines and operation characteristics.
oc6	Recognize the fundamental skills to understand the basic of semiconductor and components like diode, Transistor, MOSFET and operational

3- Learning outcomes of the course (LOs)

Upon the completion of the course, the student should be able to:

a. Cognitive Domains (LOs):

LO1	Describe the current engineering technologies as related to the electronics.

b. Psychomotor Domains (LOs):

LO2	apply appropriate scientific principles mathematical and computer-based methods for analysing generation electronic engineering system
LO3	Develop the creative thinking for resolving and innovative solutions for the practical industrial problems
LO4	Apply knowledge to Assess and evaluate the characteristics and performance of analogue electronic circuits

c. Affective Domains (LOs):

LO5	Communicate effectively with the mathematics of analogue electronics design integrally to solve engineering problems

4- Program LOs served by the course:

Upon the completion of the Program the student should be able to:

Lo11.	Principles of for electrical equipment and systems.
Lo12.	Principles of operation and performance specifications of electrical and electromechanical engineering systems .
Lo19.	Solve complex engineering problems and solve problems in the field of electrical and electrical power engineering.
Lo29.	Utilize computer program to analyze design problems and interpret numerical data and test and examine components, equipment and systems of electrical and electric power generation, control, and distribution systems.
Lo39.	Show accuracy while Designing experiments, as well as analyzing and interpreting experimental results related to electrical and electrical power systems.

5- The relation between the course learning outcomes and the program LOs

Course (LOs)		program LOs	
LO1	Describe the current engineering technologies as related to the electronics.	**Lo11.**	Principles of for electrical equipment and systems.
		Lo12.	Principles of operation and performance specifications of electrical and electromechanical engineering systems .

LO2	apply appropriate scientific principles mathematical and computer-based methods for analysing generation electronic engineering system	**Lo12.**	Principles of operation and performance specifications of electrical and electromechanical engineering systems .
LO3	Develop the creative thinking for resolving and innovative solutions for the practical industrial problems	**Lo19.**	Solve complex engineering problems and solve problems in the field of electrical and electrical power engineering.
LO4	Apply knowledge to Assess and evaluate the characteristics and performance of analogue electronic circuits	**Lo29.**	Utilize computer program to analyze design problems and interpret numerical data and test and examine components, equipment and systems of electrical and electric power generation, control, and distribution systems.
LO5	Communicate effectively with the mathematics of analogue electronics design integrally to solve engineering problems	**Lo39.**	Show accuracy while Designing experiments, as well as analyzing and interpreting experimental results related to electrical and electrical power systems.

4- Course content and the relation between the course contents and the course LOs

Week No.	Topic	Lecture hr.	Tutorial hr.	Practical hours	course LOs
1	Signal stage amplifiers.	2	0	2	LO1
2	Frequency response of one stage amplifiers	2	0	2	LO1
3	Bypass capacitors.	2	0	2	LO1
4	Emitter and source follower.	2	0	2	LO2
5	Input and output amplifiers& quiz	2	0	2	LO3
6	Multistage amplifiers	2	0	2	LO3
7	Coupling between stage.	2	0	2	LO4
8	Midterm		1.0		
9	Operational amplifiers	2	0	2	LO5
10	Properties of OP-AMPS	2	0	2	LO5
11	Simple analog computers & quiz	2	0	2	LO5
12	Comparator Schmitt trigger.	2	0	2	LO5

13	Sample and hold	2	0	2	LO5
14	Properties of OP-AMPS	2	0	2	LO5
15	Properties of OP-AMPS	2	0	2	LO5
16	Final Exam		2.0		
Total hours		28	0	28	--

5- The Teaching and learning methods and their relation to the Los of the course

Course learning Outcomes (LOs)	Teaching and Learning Methods												
	On line / face to face lectures	Tutorials: sheets/ sketches	projects	Problem solving	Brain storming	Practical: lab	Discovering/ self learning	Site visit	Reports/ researches	Cooperative work	presentation	Discussion	modelling
LO1	✓												
LO2	✓	✓											
LO3	✓	✓	✓	✓	✓	✓	✓		✓	✓			✓
LO4	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
LO5	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓

Notes:

The research concerns the cooperative work, the discussion and the presentations.
The Tutorials concerns the brain storming and the problem solving.
Online lectures used as hybrid learning, but in case of totally on-line learning all the used teaching and learning methods will be on line.

6- Student assessment method

a- Assessment method and its relation to the Los of the course

Course ILOs	Tools of assessment										
	quizzes	Mid -term exam	Final exam	sheets/ sketches	projects	Practical: lab	Oral exam	discussions	Reports/ researches	presentation	modelling
LO1											
LO2											

LO3	✓	✓		✓	✓	✓	✓	✓		✓	✓
LO4	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
LO5	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓

b- Time schedule of assessment

Quizzes	Quiz (1)	Week (3)
	Quiz (2)	Week (10)
Discussions		Every week for any student
Presentations and Movies		Weekly
Sheets and Sketches		Weekly
Researches and reports		Week (2,3)
the Projects		Week (4,8)
Practical modelling		Week (4,8)
Attendance		Weekly
Mid-term exam		Week (6)
final exam		Week (16)

c- Grading system

quizes	Quiz (1)	(5) marks	
	Quiz (2)	(5) marks	
Discussions	15%		
Sheets and Sketches	20%		
Researches and reports	20%	5 marks	(40) marks
the Projects and lab	30%		
Practical modelling	20%		
Attendance		(10) marks	
Mid-term exam		(15) marks	
final exam			(60) marks
Total			(100) marks

10- List of references:

a) Course notes — Lecture notes and handouts

b) Required books
- AdelS.Sedra KennethC.Smith microelectronic circuits international sixth edition
- D.P. Patnaika, "Analog electronics and opamp", 5th ed,

c) Recommend books — Mentioned at time.

d) Periodicals, Web sites, etc — No periodicals are needed.

11- Facilities required for teaching and learning:

- Appropriate teaching design studios including presentation board, data show
- Google classroom
- E- learning

12- Requirements for Disable facilities:

- On line teaching hours if it is needed
- Extra examples and topic-specified research

Course coordinator: Dr. Ibrahim Ali Mahmoud Abdel Dayem

Ministry of higher education
High valley institute for engineering and technology
Electrical power engineering program

program Coordinator	Dr. Ehab Mohamed Nabil Ismail Abdel Rasoul
Head of the Department	Dr. Ibrahim Ali Mahmoud Abdel Dayem
Date:	٢٠٢٣/٢٠٢٤

Course code:	Course name
CECE 312	Electronics Lab
Affiliation	
Relevant program:	Electrical power engineering
Department offering the program:	Electrical and communication engineering
Department offering the course:	Electrical and communication engineering
Date of program operation:	2008-2009
Date of approval from the higher ministry of education	27/1/2008
Date of course operation	202٣-202٤

Basic Information

Title	Electronics Lab
Code	CECE 312
Course Level	Third level courses (Junior) - Second semester (Spring)
Credit Hours	1Cr. hr
Lectures	0hr
Lab	3hr
Total	3hr
Prerequisite	Conc. with CECE 302
Instructor name/Email	Dr. Ibrahim Ali Mahmoud Abdel Dayem dr.ibrahim@sva.edu.eg

C- Professional information

1-Course core

Experiments illustrating material in CECE 302

2- Course learning objectives:

oc 1	Recognize and verify the network theorems and operation of typical electronics circuits.
oc 2	Recognize how to used the various stages of a Zener diode based regulated power supply.
oc 3	Recognize various biasing concepts, BJT based amplifiers.
oc 4	Recognize diode and it‘s applications in clipping and clamping circuits, Rectifiers and design regulated power supply using Zener diodes.
oc 5	Recognize how plot the current voltage characteristics of Diode, Transistors, and its different biasing conditions.
oc 6	Recognize the usage of semiconductor devices in designing the circuits.

3- Learning outcomes of the course (LOs)

Upon the completion of the course, the student should be able to:

a. Cognitive Domains (LOs):

-	None

b. Psychomotor Domains (LOs):

LO1	Apply acknowledge in a systematic manner suitable for analysis and design and further analyze the electric circuit using network theorems.
LO2	Use laboratory to identify the different types of semiconductor devices and their characteristics.
LO3	Apply acknowledge to deal with transistors, transistor-based amplifiers, and its biasing.
LO4	Apply acknowledge to deal with the concepts of feedback and oscillations and construct feedback amplifiers

c. Affective Domains (LOs):

LO5	Communicate effectively with the analogue electronics design integrally to solve engineering problems

4- Program LOs served by the course:

Upon the completion of the Program the student should be able to:

Lo29.	Utilize computer program to analyze design problems and interpret numerical data and test and examine components, equipment and systems of electrical and electric power generation, control, and distribution systems.
Lo39.	Show accuracy while Designing experiments, as well as analyzing and interpreting experimental results related to electrical and electrical power systems.

The relation between the course learning outcomes and the program competencies

	Course (LOs)	program competencies
LO1	Study basic circuit concepts in a systematic manner suitable for analysis and design and further analyze the electric circuit using network theorems.	**Lo29.** Utilize computer program to analyze design problems and interpret numerical data and test and examine components, equipment and systems of electrical and electric power generation, control, and distribution systems.
LO2	To understand the different types of semiconductor devices and their characteristics.	**Lo29.** Utilize computer program to analyze design problems and interpret numerical data and test and examine components, equipment and systems of electrical and electric power

	Illustrate about working of transistors, transistor-based amplifiers, and its biasing.		generation, control, and distribution systems.
LO3	Illustrate about working of transistors, transistor-based amplifiers, and its biasing.	**Lo29.**	Utilize computer program to analyze design problems and interpret numerical data and test and examine components, equipment and systems of electrical and electric power generation, control, and distribution systems.
LO4	Explain the concepts of feedback and oscillations and construct feedback amplifiers	**Lo29.**	Utilize computer program to analyze design problems and interpret numerical data and test and examine components, equipment and systems of electrical and electric power generation, control, and distribution systems.
LO5	Apply knowledge of mathematics of analogue electronics design integrally to solve engineering problems	**Lo39.**	Show accuracy while Designing experiments, as well as analyzing and interpreting experimental results related to electrical and electrical power systems.

5- Course content and the relation between the course contents and the course LOs

Week No.	Topic	Lecture hr.	Tutorial hr.	Practical hours	course LOs
1	Study and operation of digital multi-meter, function generator, regulated power supply, CRO, etc.	0	0	2	LO1
2	Verification of KVL and KCL	0	0	2	LO1
3	Verification of Superposition theorem.	0	0	2	LO1
4	Verification of Thevenin's, Norton's Theorem.	0	0	2	LO2
5	To plot the IV-characteristics of an ordinary and Zener diode and LED.	0	0	2	LO3
6	Study of Half wave and Full Wave Rectifiers.	0	0	2	LO3
7	Study of Fixed Bias, Voltage divider bias Feedback configuration for transistors.	0	0	2	LO4
8	Midterm		1.0		
9	Input and output amplifiers& quiz	0	0	2	LO5
10	Multistage amplifiers.	0	0	2	LO5
11	Coupling between stage.	0	0	2	LO5

12	Properties of OP-AMPS.	0	0	2	LO5
13	Study of transistor amplifier circuit.	0	0	2	LO5
14	Final Exam		2.0		
Total hours		0	0	28	--

6- The Teaching and learning methods and their relation to the Los of the course

Course learning Outcomes (LOs)	Teaching and Learning Methods												
	On line / face to face lectures	Tutorials: sheets/ sketches	projects	Problem solving	Brain storming	Practical: lab	Discovering / self learning	Site visit	Reports/ researches	Cooperative work	presentation	Discussion	modelling
LO1	✓	✓	✓			✓	✓			✓	✓	✓	
LO2	✓	✓	✓			✓	✓			✓	✓	✓	
LO3	✓	✓	✓			✓	✓			✓	✓	✓	
LO4	✓	✓	✓			✓	✓			✓	✓	✓	
LO5	✓	✓	✓			✓	✓			✓	✓	✓	

Notes:

The research concerns the cooperative work, the discussio and the presentations.
The Tutorials concerns on sheets
Online lectures used as hybrid learning, but in case of totally on-line learning all the used teaching and learning methods will be on line.

7- Student assessment method

a- Assessment method and its relation to the Los of the course

Course ILOs	Tools of assessment										
	quizzes	Mid -term exam	Final exam	sheets/ sketches	projects	Practical: lab	Oral exam	discussions	Reports/ researches	presentation	modelling
LO1		✓	✓	✓	✓	✓	✓	✓		✓	
LO2		✓	✓	✓	✓	✓	✓	✓		✓	
LO3		✓	✓	✓	✓	✓	✓	✓		✓	
LO4		✓	✓	✓	✓	✓	✓	✓		✓	
LO5		✓	✓	✓	✓	✓	✓	✓		✓	

b- Time schedule of assessment

Discussions	Every week for any student
Presentations and Movies	weekly

Sheets and Sketches	weekly
the Projects	weekly
Attendance	weekly
Mid-term exam	Week (8)
final exam	Week (16)

c- Grading system

Discussions	20%		
Sheets and Sketches	70%	40 marks	
the Projects	10%		(60) marks
Attendance		(10) marks	
Mid-term exam		(10) marks	
final exam			(40) marks
Total			(100) marks

10- List of references:

a) Course notes	▪ Lecture notes and handouts
b) Required books	▪ AdelS.Sedra Kenneth C.Smith microelectronic circuits international, Eighth Edition
c) Recommend books	▪ D.P. Patnaika, "Analog electronics and opamp", 3rd ed, 2007
d) Periodicals, Web sites, etc	▪ Mentioned at time.

11- Facilities required for teaching and learning:

- Appropriate teaching design studios including presentation board, data show
- Google classroom
- E- learning

12- Requirements for Disable facilities:

- On line teaching hours if it is needed
- Extra examples and topic-specified research

Course coordinator:	Dr. Ibrahim Ali Mahmoud Abdel Dayem
program Coordinator	Dr. Ehab Mohamed Nabil Ismail Abdel Rasoul
Head of the Department	Dr. Ibrahim Ali Mahmoud Abdel Dayem
Date:	٢٠٢٣/٢٠٢٤

Ministry of higher education
High valley institute for engineering and technology
Electrical power engineering program

Course specification

Course code:	Course name
CECE 306	Electromagnetic Theory
A- A Affiliation	
Relevant program:	Electrical power engineering
Department offering the program:	Electrical and communication engineering
Department offering the course:	Electrical and communication engineering
Date of program operation:	2008-2009
Date of approval from the higher ministry of education	27/1/2008
Date of course operation	202٣-202٤

B- Basic Information

Title	Electromagnetic Theory
Code	CECE 306
Course Level	Third level courses (Junior) - Second semester (Spring)
Credit Hours	3Cr. hr
Lectures	2hr
lab	3hr
Total	5hr
Prerequisite	Conc. with PHYS 102 , MATH 201
Instructor name/Email	Prof. Dr. Hussein Hamed Al-Ghaz Hussein Al-goz@sva.edu.eg

C- Professional information

1- Course core

Electric field and potential. Gauss's law; divergence. Conductors, dielectrics and capacitance. Poisson's and Laplace's equations. Electrostatic analogs. Magnetic field and vector potential. Time varying fields; displacement current. Maxwell's equations in differential form

2- Course learning objectives:

oc 1	Recognize how determine length, area, and volume in three dimensional (3D) orthogonal coordinate system (rectangular, cylindrical, and spherical coordinates).
oc 2	Recognize how formulate vector representation of an electric field or electric flux density given a known charge distribution or a potential field.
oc 3	Recognize and develop relationship between electric field, potential, and energy density (potential energy stored) in the electrostatic field.
oc 4	Recognize the relate static electric or magnetic field in the presence of dielectric or magnetic materials. Identify them across the boundaries of various insulating or magnetic materials.

oc 5	find the capacitance and stored energy with one dimensional potential variation using direct integration (Laplace's equation).
oc 6	apply known magnetic field laws to quantify different magnetic fields due to direct current. Define physical interpretation of curl and divergence with application of divergence and Stoke's theorems
oc 7	determine the force or moment of force exerted by the magnetic field on other charges. Formulate point and integral forms of Maxwell's equations for time-varying electric and magnetic fields and apply them to simple EM problems.

1- Learning outcomes of the course (LOs)

Upon the completion of the course, the student should be able to:

a. Cognitive Domains (LOs):

LO1	Determine length, area, and volume in three dimensional (3D) orthogonal coordinate system(rectangular, cylindrical, and spherical coordinates).

b. Psychomotor Domains (LOs):

LO2	Produce the vector representation of an electric field or electric flux density given a known charge distribution or a potential field.
LO3	Conduct and Develop relationship between electric field, potential, and energy density (potential energy stored) in the electrostatic field.
LO4	Produce the relate static electric or magnetic field in the presence of dielectric or magnetic materials. Identify them across the boundaries of various insulating or magnetic materials.
LO5	Solve the capacitance and stored energy with one dimensional potential variation using direct integration (Laplace's equation).
LO6	Apply known magnetic field laws to quantify different magnetic fields due to direct current. Define physical interpretation of curl and divergence with application of divergence and Stoke's theorems.

c. Affective Domains (LOs):

LO7	Express the acknowledge for force or moment exerted by the magnetic field on other charges and express the equation for point and integral forms of Maxwell's equations for time-varying electric and magnetic fields and apply them to simple EM problems.

4- Program LOs served by the course:

Upon the completion of the Program the student should be able to:

Lo10.	Identify the basic knowledge in mathematics, science and engineering in Communication Engineering field.
Lo19.	Solve complex engineering problems and solve problems in the field of electrical and electrical power engineering

Lo28.	knowledge to design and conduct experiments, analyze, synthesize and interpret the data pertaining to Communication Engineering problems and arrive at valid conclusion.
Lo38.	Develop consciousness of professional, ethical and social responsibilities as experts in the field of Communication Engineering.

2- The relation between the course learning outcomes and the program competencies

Course (LOs)		program competencies	
LO1	Determine length, area, and volume in three dimensional (3D) orthogonal coordinate system (rectangular, cylindrical, and spherical coordinates).	**Lo10.**	Identify the basic knowledge in mathematics, science and engineering in Communication Engineering field.
LO2	Produce the vector representation of an electric field or electric flux density given a known charge distribution or a potential field.	**Lo19.**	Solve complex engineering problems and solve problems in the field of electrical and electrical power engineering
LO3	Conduct and Develop relationship between electric field, potential, and energy density (potential energy stored) in the electrostatic field.	**Lo28.**	knowledge to design and conduct experiments, analyze, synthesize and interpret the data pertaining to Communication Engineering problems and arrive at valid conclusion.
LO4	Produce the relate static electric or magnetic field in the presence of dielectric or magnetic materials. Identify them across the boundaries of various insulating or magnetic materials.	**Lo19.**	Solve complex engineering problems and solve problems in the field of electrical and electrical power engineering

LO5	Produce the relate static electric or magnetic field in the presence of dielectric or magnetic materials. Identify them across the boundaries of various insulating or magnetic materials.	**Lo19.** Solve complex engineering problems and solve problems in the field of electrical and electrical power engineering
LO6	Solve the capacitance and stored energy with one dimensional potential variation using direct integration (Laplace's equation).	**Lo19.** Solve complex engineering problems and solve problems in the field of electrical and electrical power engineering
LO7	Express the acknowledge for force or moment exerted by the magnetic field on other charges and express the equation for point and integral forms of Maxwell's equations for time-varying electric and magnetic fields and apply them to simple EM problems.	**Lo38.** Develop consciousness of professional, ethical and social responsibilities as experts in the field of Communication Engineering.

3- Course content and the relation between the course contents and the course LOs

Week No.	Topic	Lecture hr.	Tutorial hr.	Practical hours	course LOs
1	Introduction Review of vector algebra, Coordinate systems and transformation, vector calculus, Divergence and Stokes' theorems, and the Laplace operator.	2	0	2	LO1
2	Focuses on Coulomb's law and Electrostatic fields for discrete and continuous charges in vacuum.	2	0	2	LO1
3	Electric flux density, gauss's law, applications of gauss's law, electric scalar potential.	2	0	2	LO1
4	relationship between electrostatic fields and the scalar potential, and work done.	2	0	2	LO2
5	Electric dipole, energy and energy density, fundamental postulates of electrostatic field.	2	0	2	LO3
6	boundary conditions of static electric field in conductor Poisson's and Laplace's equations.	2	0	2	LO3

7	Discrete memoryless channel.	2	0	2	LO3
8	Midterm		1.0		
9	Dielectrics and polarization, boundary conditions and capacitance, Conductors, Current density, and Resistance.	2	0	2	LO4
10	Image method and Boundary value problems (Poisson's and Laplace's equations in different coordinate systems).	2	0	2	LO4
11	Magnetostatic fields Biot savart and Ampere's law.	2	0	2	LO5
12	magnetic flux density, magnetic scalar and vector potentials.	2	0	2	LO5
13	Comparison between Magnetostatic and Electrostatic fields	2	0	2	LO6
14	Magnetic force, magnetic dipole, magnetic materials, magnetic energy, boundary conditions, and Magnetic circuits .	2	0	2	LO6
15	Maxwell's equation for time varying fields, Faraday's law.	2	0	2	LO7
16	Final Exam		2.0		
Total hours		28	0	28	--

4- The Teaching and learning methods and their relation to the Los of the course

Course learning Outcomes (LOs)	Teaching and Learning Methods												
	On line / face to face lectures	Tutorials: sheets/ sketches	projects	Problem solving	Brain storming	Practical: lab	Discovering / self learning	Site visit	Reports/ researches	Cooperative work	presentation	Discussion	modelling
LO1	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	
LO2	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	
LO3	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	
LO4	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	
LO5	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	
LO6	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	
LO7	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	

Notes:

The research concerns the cooperative work, the discussion and the presentations.
The Tutorials concerns the brain storming and the problem solving.
Online lectures used as hybrid learning, but in case of totally on-line learning all the used teaching and learning methods will be on line.

5- Student assessment method

a- Assessment method and its relation to the Los of the course

Course ILOs	Tools of assessment										
	quizzes	Mid -term exam	Final exam	sheets/ sketches	projects	Practical: lab	Oral exam	discussions	Reports/ researches	presentation	modelling
LO1	✓	✓	✓	✓	✓	✓	✓	✓		✓	
LO2	✓	✓	✓	✓	✓	✓	✓	✓		✓	
LO3	✓	✓	✓	✓	✓	✓	✓	✓		✓	
LO4	✓	✓	✓	✓	✓	✓	✓	✓		✓	
LO5	✓	✓	✓	✓	✓	✓	✓	✓		✓	
LO6	✓	✓	✓	✓	✓	✓	✓	✓		✓	
LO7	✓	✓	✓	✓	✓	✓	✓	✓		✓	

b- Time schedule of assessment

Quizzes	Quiz (1)	Week (3)
	Quiz (2)	Week (10)
Discussions		Every week for any student
Presentations and Movies		weekly
Sheets and Sketches		weekly
the Projects		weekly
Attendance		weekly
Mid-term exam		Week (8)
final exam		Week (16)

c- Grading system

Quizes	Quiz (1)	(5) marks	(40) marks
	Quiz (2)	(5) marks	
Discussions	30%	5 marks	
Sheets and Sketches	40%		
the Projects	30%		
Attendance		(10) marks	
Mid-term exam		(15) marks	
final exam			(60) marks
Total			(100) marks

10- List of references:

a) Course notes	Lecture notes and handouts
b) Required books	W.Haytand J . Buck, Engineering Electromagnetic, McGraw - Hill, 9th Ed.
c) Recommend books	Mentioned at time.
d) Periodicals, Web sites, etc	No periodicals are needed.

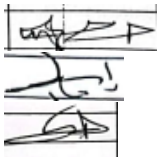
11- Facilities required for teaching and learning:

- Appropriate teaching design studios including presentation board, data show
- Google classroom
- E- learning

12- Requirements for Disable facilities:

- On line teaching hours if it is needed
- Extra examples and topic-specified research

Course coordinator:	Prof. Dr. Hussein Hamed Al-Ghaz
program Coordinator	Dr. Ehab Mohamed Nabil Ismail Abdel Rasoul
Head of the Department	Dr. Ibrahim Ali Mahmoud Abdel Dayem
Date:	٢٠٢٣/٢٠٢٤



Course specification

Course code:	**Course name**
CECE 325	Fundamental of communication
Affiliation	
Relevant program:	Electronic and communication engineering
Department offering the program:	Electrical and communication engineering
Department offering the course:	Electrical and communication engineering
Date of program operation:	2008-2009
Date of approval from the higher ministry of education	27/1/2008
Date of course operation	٢٠٢٣-٢٠٢٤

Basic Information

Course Name	Fundamental of communication
Code	CECE 325
Course Level	Third level courses (Junior) - Second semester (Spring)
Credit Hours	3Cr. hr
Lectures	2hr
Tutorial	2hr
Total	4hr
Prerequisite	CECE 303
Instructor name/Email	Ass. Prof. Dr. Ashraf Mohamed Ali Hassan Asherf Ali @sva.edu.eg

Professional information

1- Course core

Signal representation and classification, time and frequency domains and transform, power spectral analysis. Basics of analog communication: amplitude, angle, and analog pulse modulation; modulators and demodulators; frequency multiplexing. Basics of digital communication: sampling, quantization, pulse code modulation, (PCM), Delta Modulation, Differential PCM, time division multiplexing, binary signal formats. Introduction to Random Processes. Noise in communication systems.

2- Course learning objectives:

oc 1	Recognize the basic science and basic mathematics and be able to use these tools in their own engineering field.
oc 2	Produce the necessary techniques, hardware, and communication tools for modern engineering applications
oc 3	Make the work in a multi-disciplinary environment, and follow and contribute to the developments in their own field recognizing the significance of lifelong learning.
oc 4	Recognize the fields of integrated electronic circuits, electronic data storage, high-speed computing, communications, signal processing, microwave, wave propagation and antenna, optoelectronics, automation, automatic control, and monitoring systems, circuit analysis, network analysis, digital signal processing, and microprocessors

oc 5	Recognize how balance between theoretical and laboratory experience and to impart a fundamental and practical understanding of the principles required for a successful career in electronics engineering.
oc 6	recognize the solid core of foundation courses in physics, mathematics, computer science, and general engineering, which is also essential for lifelong learning.
oc 7	Recognize the electromagnetic, wave propagation and antenna, circuits, electronics, power electronic devices, digital logic design, computers, programming, computer networks, signal processing, opto-electronics ,and communications

3- Learning outcomes of the course (LOs)

Upon the completion of the course, the student should be able to:

a. Cognitive Domains (LOs):

LO1	Recognize the signals fundamental & linear time invariant systems used in communication systems.
LO2	Recognize the basic concepts of sampling theory
LO3	Recognize the probability, random variables & random processes
LO4	Identify different types of analog communication system and different modulation techniques used in these systems

b. Psychomotor Domains (LOs):

LO5	Apply acknowledge to analyze the properties of Fourier series for continuous time signals
LO6	Apply acknowledge to analyze of noise and its impact on different modulation techniques.

c. Affective Domains (LOs):

LO7	Express all of the preceding basic concepts to practical issues

4- Program LOs served by the course:

Upon the completion of the Program the student should be able to:

Lo10.	Identify the basic knowledge in mathematics, science and engineering in Communication Engineering field.
Lo28.	knowledge to design and conduct experiments, analyze, synthesize and interpret the data pertaining to Communication Engineering problems and arrive at valid conclusion.
Lo38.	Develop consciousness of professional, ethical and social responsibilities as experts in the field of Communication Engineering.

4- The relation between the course learning outcomes and the program competencies

Course (LOs)		program competencies	
LO1	Know signals fundamental & linear time invariant systems used in communication systems.	**Lo10.**	Identify the basic knowledge in mathematics, science and engineering in Communication Engineering field.

LO2	Understanding the basic concepts of sampling theory	**Lo10.**	Identify the basic knowledge in mathematics, science and engineering in Communication Engineering field.
LO3	Knowledge of probability, random variables & random processes	**Lo10.**	Identify the basic knowledge in mathematics, science and engineering in Communication Engineering field.
LO4	Know different types of analog communication system and different modulation techniques used in these systems	**Lo10.**	Identify the basic knowledge in mathematics, science and engineering in Communication Engineering field.
LO5	Apply the properties of Fourier series for continuous time signals	**Lo28.**	knowledge to design and conduct experiments, analyze, synthesize and interpret the data pertaining to Communication Engineering problems and arrive at valid conclusion.
LO6	Analyze of noise and its impact on different modulation techniques.	**Lo28.**	knowledge to design and conduct experiments, analyze, synthesize and interpret the data pertaining to Communication Engineering problems and arrive at valid conclusion.
LO7	Apply all of the preceding basic concepts to practical issues	**Lo38.**	Develop consciousness of professional, ethical and social responsibilities as experts in the field of Communication Engineering.

5- Course content and the relation between the course contents and the course Los

Week No.	Topic	Lecture hr.	Tutorial hr.	Practical hours	course Los
1	Introduction to Signals, Signal Classification, Continuous/ Discrete-Time Signals	2	2	0	LO1
2	Fourier series, Fourier transform & Its Properties'. Time-Invariant, Signal transmission through LTI Systems, Auto correlation, Cross correlation, Energy and power spectral density.	2	2	0	LO2
3	Probability, Random Variables & their moments, their significance, Gaussian & Rayleigh Probability density functions	2	2	0	LO5
4	Amplitude Modulation: Need of Modulation, Block schematic of a typical communication system	2	2	0	LO3
5	AM modulation system, Modulation index, Generation (Squire Law & Switching Modulator)	2	2	0	LO5

6	AM Detection (Envelope & Squire Law Detector) of AM wave , Side bands & Power contents in AM Wave,	2	2	0	LO3
7	AM transmitter block diagram, TRF receiver & its limitations, Necessity of heterodyning, Super heterodyne radio receivers, IF amplifiers & selection of IF				LO4
8	Midterm	1.0			
9	DSB-SC (Balanced, Ring Modulator & Synchronous Detector), SSB-SC, Methods of generation & detection,	2	2	0	LO3
10	VSB modulation, Comparison of various AM systems, Frequency division multiplexing, Group delay & phase delay.	2	2	0	LO4
11	Revision	2	2	0	LO2
12	Frequency Modulation: Relationships between Phase & Frequency Modulation, Narrowband FM, Wideband FM & their Spectrum, Transmission bandwidth of FM And PM signals.	2	2	0	LO6
13	Methods of generation (Direct & Indirect) & detection of FM (Discriminators : Balanced, Phase Shift And PLL Detector), Pre- Emphasis & De-Emphasis, Stereophonic FM Broadcasting.	2	2	0	LO7
14	Revision 1	2	2	0	LO3
15	Revision 2	2	2	0	LO3
16	Final Exam	2.0			
Total hours		28	28	0	--

6- The Teaching and learning methods and their relation to the Los of the course

Course learning Outcomes (LOs)	**Teaching and Learning Methods**												
	On line / face to face lectures	**Tutorials: sheets/ sketches**	**projects**	**Problem solving**	**Brain storming**	**Practical: lab**	**discovering**	**Site visit**	**Reports/ researches**	**Cooperative work**	**presentation**	**Discussion**	**...**
LO1	✓												
LO2	✓	✓											
LO5	✓	✓	✓	✓	✓		✓		✓	✓			✓
LO3	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓
LO4	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓
LO6	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓
LO7	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓

Notes:
The research concerns the cooperative work, the discussion and the presentations.
The Tutorials concerns the brain storming and the problem solving.
Online lectures used as hybrid learning, but in case of totally on-line learning all the used teaching and learning methods will be on line.

7- Student assessment method

a- Assessment method and its relation to the Los of the course

Course lLOs	Tools of assessment										
	quizzes	Mid -term exam	Final exam	sheets/ sketches	projects	Practical: lab	Oral exam	discussions	Reports/ researches	presentation	modelling
LO1											
LO2											
LO5	✓	✓	✓	✓	✓		✓		✓		✓
LO3	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
LO4	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
LO6	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
LO7	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓

b- Time schedule of assessment

Quizzes	Quiz (1)	Week (3)
	Quiz (2)	Week (10)
Discussions		Every week for any student
Presentations and Movies		weekly
Sheets and Sketches		weekly
Researches and reports		Week (2,3)
the Projects		Week (4,8)
Practical modelling		Week (4,8)
Attendance		weekly
Mid-term exam		Week (7)
final exam		Week (14)

c- Grading system

quizes	Quiz (1)	(5) marks	
	Quiz (2)	(5) marks	
Discussions	15%		
Sheets and Sketches	20%		(40) marks
Researches and reports	20%	5 marks	
the Projects	30%		
Practical modelling	20%		

Attendance	(10) marks
Mid-term exam	(15) marks
final exam	(60) marks
Total	(100) marks

10- List of references:

e) Course notes	Fundamental of Communication
f) Required books	▪ Fundamentals of Signals and Systems Using the Web and MATLAB Edward W. Kamen Bonnie S Heck Third Edition ▪ K. Deergha Rao. Signals and Systems
g) Recommend books	Mentioned at time.
h) Periodicals, Web sites, etc	No periodicals are needed.

13- Facilities required for teaching and learning:

- Appropriate teaching design studios including presentation board, data show
- Google classroom
- E- learning

14- Requirements for Disable facilities:

- On line teaching hours if it is needed
- Extra examples and topic-specified research

Course coordinator:	Ass. Prof. Dr. Ashraf Mohamed Ali Hassan
program Coordinator	Dr. Ehab Mohamed Nabil Ismail Abdel Rasoul
Head of the Department	Dr. Ibrahim Ali Mahmoud Abdel Dayem
Date:	٢٠٢٣/٢٠٢٤

Ministry of higher education
High valley institute for engineering and technology
Electrical power engineering program

Course code:	Course name
CECE 326	Communication Lab
A- Affiliation	
Relevant program:	Electronic and communication engineering
Department offering the program:	Electrical and communication engineering
Department offering the course:	Electrical and communication engineering
Date of program operation:	2008-2009
Date of approval from the higher ministry of education	27/1/2008
Date of course operation	202٣-202٤

B- Basic Information

Course Name	Communication Lab
Code	CECE 326
Course Level	Third level courses (Junior) - Second semester (Spring)
Credit Hours	1Cr. hr
Lectures	0hr
Lab	3hr
Total	3hr
Prerequisite	Conc. with CECE 325
Instructor name/Email	Ass. Prof. Dr. Ashraf Mohamed Ali Hassan Asherf Ali @sva.edu.eg

C- Professional information

1- Course core

Laboratory practice and experimental studies on topics covered in the course

2- Course learning objectives:

oc 1	Produce the necessary techniques, hardware, and communication tools for modern engineering applications
oc 2	make in a multi-disciplinary environment and follow and contribute to the developments in their own field recognizing the significance of lifelong learning.
oc 3	recognize the fields of integrated electronic circuits, electronic data storage, high-speed computing, communications, signal processing, microwave, wave propagation and antenna, optoelectronics, automation, automatic control, and monitoring systems, circuit analysis, network analysis, digital signal processing, and microprocessors
oc 4	make a balance between theoretical and laboratory experience and to impart a fundamental and practical understanding of the principles required for a successful career in electronics engineering.
oc 5	Recognize the electromagnetic, wave propagation and antenna, circuits, electronics, power electronic devices, digital logic design, computers,

	programming, computer networks, signal processing, optoelectronics, and communications

3- Learning outcomes of the course (LOs)

Upon the completion of the course, the student should be able to:

a. Cognitive Domains (LOs):

-	None

b. Psychomotor Domains (LOs):

LO1	Apply the Knowledge of probability, random variables & random processes.
LO2	An ability to apply knowledge of communication theory and equations practically
LO3	Ability to simulate communication experiment using Emona101.
LO4	Ability to simulate communication experiment using MATLAB simulation (Simulink & coding).
LO5	Ability to create the function in teams.

c. Affective Domains (LOs):

LO6	Communicate effectively for design the electronic component related to communication.

4- Program LOs served by the course:

Upon the completion of the Program the student should be able to:

Lo28.	knowledge to design and conduct experiments, analyze, synthesize and interpret the data pertaining to Communication Engineering problems and arrive at valid conclusion.
Lo38.	Develop consciousness of professional, ethical and social responsibilities as experts in the field of Communication Engineering.

4- The relation between the course learning outcomes and the program competencies

Course (LOs)		**program competencies**	
LO1	Apply the Knowledge of probability, random variables & random processes.	**Lo28.**	knowledge to design and conduct experiments, analyze, synthesize and interpret the data pertaining to Communication Engineering problems and arrive at valid conclusion.
LO2	An ability to apply knowledge of communication theory and equations practically	**Lo28.**	knowledge to design and conduct experiments, analyze, synthesize and interpret the data pertaining to Communication Engineering problems and arrive at valid conclusion.

LO3	Ability to simulate communication experiment using Emona101.	**Lo28.**	knowledge to design and conduct experiments, analyze, synthesize and interpret the data pertaining to Communication Engineering problems and arrive at valid conclusion.
LO4	Ability to simulate communication experiment using MATLAB simulation (Simulink & coding).	**Lo28.**	knowledge to design and conduct experiments, analyze, synthesize and interpret the data pertaining to Communication Engineering problems and arrive at valid conclusion.
LO5	Ability to function in teams.	**Lo28.**	knowledge to design and conduct experiments, analyze, synthesize and interpret the data pertaining to Communication Engineering problems and arrive at valid conclusion.
LO6	Communicate effectively for design the electronic component related to communication.	**Lo38.**	Develop consciousness of professional, ethical and social responsibilities as experts in the field of Communication Engineering.

5- Course content and the relation between the course contents and the course Los

Week No.	Topic	Lecture hr.	Tutorial hr.	Practical hours	course LOs
1	Introduction to Signals, simulate different kind of signal (Analogue-Digital)	0	0	2	LO2
2	Apply different simple process (multiplication-addition-subtraction-convolution) using kit and MATLAB	0	0	2	LO3
3	Apply the Probability of Random Variables(using AWGN) & their moments, their significance, Gaussian & Rayleigh Probability density functions	0	0	2	LO4
4	Simulate Amplitude Modulation: Need of Modulation, Block schematic of a typical communication system using Kit and MATAB	0	0	2	LO1
5	Simulate AM modulation system, Modulation index, Generation (Squire Law & Switching Modulator) using Kit and MATAB	0	0	2	LO4
6	Simulate AM Detection (Envelope & Squire Law Detector) of AM	0	0	2	LO1

	wave , Side bands & Power contents in AM Wave, using Kit and MATAB				
7	Simulate AM transmitter block diagram, TRF receiver & its limitations, Necessity of heterodyning, Super heterodyne radio receivers, IF amplifiers & selection of IF, using Kit and MATAB	0	0	2	LO5
8	Midterm		1.0		
9	Simulate DSB-SC (Balanced, Ring Modulator & Synchronous Detector), SSB-SC, Methods of generation & detection, using Kit and MATAB	0	0	2	LO1
10	Simulate SSB modulation, Comparison of various AM systems using Kit and MATAB.	0	0	2	LO5
11	Revision	0	0	2	LO3
12	Simulate Frequency Modulation: Relationships between Phase & Frequency Modulation, Narrowband FM, Wideband FM & their Spectrum, Transmission bandwidth of FM And PM signals, using Kit and MATAB.	0	0	2	LO6
13	Simulate Methods of generation (Direct & Indirect) & detection of FM (Discriminators : Balanced, Phase Shift And PLL Detector), Pre-Emphasis & De-Emphasis, Stereophonic FM Broadcasting, using Kit and MATAB.	0	0	2	LO6
14	Revision	0	0	2	LO3
15	Simulate Frequency Modulation: Relationships between Phase & Frequency Modulation, Narrowband FM, Wideband FM & their Spectrum, Transmission bandwidth of FM And PM signals, using Kit and MATAB.	0	0	2	LO3
16	Final Exam		2.0		
Total hours		0	0	28	--

6- The Teaching and learning methods and their relation to the Los of the course

Course learning Outcomes (LOs)	Teaching and Learning Methods												
	On line / face to face lectures	Tutorials: sheets/ sketches	projects	Problem solving	Brain storming	Practical: lab	discovering	Site visit	Reports/ researches	Cooperative work	presentation	Discussion	modelling
LO2	✓	✓	✓			✓	✓			✓	✓	✓	
LO3	✓	✓	✓			✓	✓			✓	✓	✓	
LO4	✓	✓	✓			✓	✓			✓	✓	✓	
LO1	✓	✓	✓			✓	✓			✓	✓	✓	
LO5	✓	✓	✓			✓	✓			✓	✓	✓	
LO6	✓	✓	✓			✓	✓			✓	✓	✓	

Notes:

The research concerns the cooperative work, the discussion and the presentations.
The Tutorials concerns on sheets
Online lectures used as hybrid learning, but in case of totally on-line learning all the used teaching and learning methods will be on line.

7- Student assessment method

a- Assessment method and its relation to the Los of the course

Course ILOs	Tools of assessment										
	quizzes	Mid -term exam	Final exam	sheets/ sketches	projects	Practical: lab	Oral exam	discussions	Reports/ researches	presentation	modelling
LO2		✓	✓	✓	✓	✓	✓	✓		✓	
LO3		✓	✓	✓	✓	✓	✓	✓		✓	
LO4		✓	✓	✓	✓	✓	✓	✓		✓	
LO1		✓	✓	✓	✓	✓	✓	✓		✓	
LO5		✓	✓	✓	✓	✓	✓	✓		✓	
LO6		✓	✓	✓	✓	✓	✓	✓		✓	

b- Time schedule of assessment

Quizzes	Quiz (1) Quiz (2)	
Discussions		Every week for any student
Presentations and Movies		weekly
Sheets and Sketches		weekly

the Projects	weekly	
Attendance	weekly	
Mid-term exam	Week (8)	
final exam	Week (16)	

c- Grading system

Discussions	20%		
Sheets and Sketches	70%	40 marks	
the Projects	10%		60 marks
Attendance		(10) marks	
Mid-term exam		(10) marks	
final exam			(40) marks
Total			(100) marks

10- List of references:

a) Course notes	Fundamental of Communication
b) Required books	▪ Emona 101 lab manual ▪ Fundamentals of Signals and Systems Using the Web and MATLAB Edward W. Kamen Bonnie S Heck Third Edition
c) Recommend books	▪ Mentioned at time.
d) Periodicals, Web sites, etc	▪ Mentioned at time.

11- Facilities required for teaching and learning:

- Appropriate teaching design studios including presentation board, data show
- Google classroom
- E- learning

12- Requirements for Disable facilities:

- On line teaching hours if it is needed
- Extra examples and topic-specified research

Course coordinator:	Ass. Prof. Dr. Ashraf Mohamed Ali Hassan
program Coordinator	Dr. Ehab Mohamed Nabil Ismail Abdel Rasoul
Head of the Department	Dr. Ibrahim Ali Mahmoud Abdel Dayem
Date:	٢٠٢٣/٢٠٢٤

Course specification

Course code:	Course name
MATH 302	Linear Algebra and Matrices
Affiliation	
Relevant program:	Electrical power engineering
Department offering the program:	Electrical and communication engineering
Department offering the course:	Electrical and communication engineering
Date of program operation:	2008-2009
Date of approval from the higher ministry of education	27/1/2008
Date of course operation	202٣-202٤

Basic Information

Course Name	Linear Algebra and Matrices
Code	MATH 302
Course Level	Third level courses (Junior) - Second semester (Spring)
Credit Hours	3Cr. hr
Lectures	2hr
Tutorial	2hr
Total	4hr
Prerequisite	MATH 202
Instructor name/Email	Dr. Gamal El-Anani gamalanany@sva.edu.eg

Professional information

1- course core

Covers systems of linear equation, algebra of matrices, linear transformation determinants, vector spaces, inner product spaces, eigenvalues and eigenvector diagonalization and orthogonally, special matrices and applications. The use of comput software such as MathCAD, mathematic, or MATLAB is essential.

2- Course learning objectives:

oc 1	Recognize the concepts of systems of linear equation
oc 2	explain the concepts of mathematical of algebra of matrices
oc 3	apply knowledge of mathematics to linear transformations
oc 4	explain the concepts of determinants
oc 5	Identify and analyze data, to Deal with design situations within solving desig problems based on the analytical process for vector spaces.
oc 6	Recognize the methodologies of solving engineering problems with inner product spac
oc 7	apply knowledge of theory of equations, eigenvalues, and eigenvectors to sol engineering problems.

3- Learning outcomes of the course (LOs)

Upon the completion of the course, the student should be able to:

a. Cognitive Domains (LOs):

LO1	Explain concepts and theories of mathematics and sciences, appropriate to Linear Algebra and Matrices.
LO2	Demonstrate methodologies of solving engineering problems, data collection and interpretation.

a. Psychomotor Domains (LOs):

LO3	Select appropriate solutions for engineering problems based on analytical thinking.
LO4	Apply knowledge of mathematics to solve engineering problems.
LO5	Apply knowledge of linear algebraic equations, iterative methods, and infinite series to solve engineering problems and prepare and present technical reports about application of matrices to solve engineering problems.
LO6	Produce and prepare the manages tasks, time, and resources, when solving mathematics problems, and in exams.

c. Affective Domains (LOs):

LO7	Communicate effectively by applying the knowledge of mathematics to solve differential problems.

4- Program LOs served by the course: :

Upon the completion of the Program the student should be able to:

Lo1.	Identify, formulate basic science and mathematics.
Lo2.	Simulate, analyze and interpret data.
Lo19.	Solve complex engineering problems and solve problems in the field of electrical and electrical power engineering.
Lo34.	Use creative, innovative and flexible thinking.

5- The relation between the course learning outcomes and the program LOs

Course (LOs)		program LOs	
LO1	Explain concepts and theories of mathematics and sciences, appropriate to Linear Algebra and Matrices.	**Lo1.**	Identify, formulate basic science and mathematics.
LO2	Demonstrate methodologies of solving engineering problems, data collection and interpretation.	**Lo2.**	Simulate, analyze and interpret data.

LO3	Select appropriate solutions for engineering problems based on analytical thinking.	**Lo19.**	Solve complex engineering problems and solve problems in the field of electrical and electrical power engineering.
LO4	Apply knowledge of mathematics to solve engineering problems.	**Lo19.**	Solve complex engineering problems and solve problems in the field of electrical and electrical power engineering.
LO5	Apply knowledge of linear algebraic equations, iterative methods, and infinite series to solve engineering problems and prepare and present technical reports about application of matrices to solve engineering problems.	**Lo19.**	Solve complex engineering problems and solve problems in the field of electrical and electrical power engineering.
LO6	Produce and prepare the manages tasks, time, and resources, when solving mathematics problems, and in exams.	**Lo19.**	Solve complex engineering problems and solve problems in the field of electrical and electrical power engineering.
LO7	Communicate effectively by applying the knowledge of mathematics to solve differential problems	**Lo34.**	Use creative, innovative and flexible thinking.

6- Course content and the relation between the course contents and the course LOs

Week No.	Topic	Lecture hr.	Tutorial hr.	Practical hours	course LOs
1	The concept of matrices	2	2	0	LO1:2
2	Covers systems of linear equation	2	2	0	LO1:2
3	algebra of matrices	2	2	0	LO2:6
4	linear transformations	2	2	0	LO2:4
5	determinants	2	2	0	LO2:4
6	vector spaces	2	2	0	LO2:4
7	inner product spaces				LO4
8	Midterm		1.0		
9	eigenvalues and eigenvectors	2	2	0	LO2:4
10	diagonalization	2	2	0	LO2:4
11	orthogonally	2	2	0	LO2, 5

12	special matrices and applications	2	2	0	LO2, 4
13	The use of computer software such as MathCAD	2	2	0	LO2, 4
14	MATLAB	2	2	0	LO2, 4
15	Revision				LO2, 4
16	Final Exam		2.0		
Total hours		28	28	0	--

7- The Teaching and learning methods and their relation to the Los of the course

Course learning Outcomes (LOs)	Teaching and Learning Methods												
	On line / face to face lectures	Tutorials: sheets/ sketches	projects	Problem solving	Brain storming	Practical: lab	Discovering / SELF LEARNING	Site visit	Reports/ researches	Cooperative work	presentation	Discussion	modelling
LO1	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	
LO2	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	
LO3	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	
LO4	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	
LO5	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	
LO6	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	
LO7	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	

Notes:

- *The research concerns the cooperative work, the discussion and the presentations.*
- *The Tutorials concerns the brain storming and the problem solving.*

Online lectures used as hybrid learning, but in case of totally on-line learning all the used teaching and learning methods will be on line.

8- Student assessment method

a- Assessment method and its relation to the Los of the course

Course ILOs	Tools of assessment										
	quizzes	Mid -term exam	Final exam	sheets/ sketches	projects	Practical: lab	Oral exam	discussions	Reports/ researches	presentation	modelling
LO1	✓	✓	✓	✓				✓	✓	✓	
LO2	✓	✓	✓	✓				✓	✓	✓	
LO3	✓	✓	✓	✓				✓	✓	✓	
LO4	✓	✓	✓	✓				✓	✓	✓	
LO5	✓	✓	✓	✓				✓	✓	✓	
LO6	✓	✓	✓	✓				✓	✓	✓	
LO7	✓	✓	✓	✓				✓	✓	✓	

b- Time schedule of assessment

Quizzes	Quiz (1) Week (3) Quiz (2) Week (10)
Discussions	Every week for any student
Presentations and Movies	weekly
Sheets and Sketches	weekly
Researches and reports	Week (2,3)
Attendance	weekly
Mid-term exam	Week (8)
final exam	Week (16)

c- Grading system

quizes	Quiz (1) Quiz (2)	(5) marks (5) marks	
Discussions	25%		
Sheets and Sketches	50%	10 marks	(50) marks
Researches and reports	25%		
Attendance		(10) marks	
Mid-term exam		(20) marks	
final exam			(50) marks
Total			(100) marks

10- List of references:

a) Course notes	Lecture notes and handouts
b) Required books	▪ Mary Attenborough, Engineering Mathematics, McGraw - HILL Book Company Europe, 1994. ▪ Anthony croft, Robert Davison, Engineering Mathematics A modern Foundation for Electrical, Electronic & Control Engineering, Addison - Wesley - Publishing Company, 1992
c) Recommend books	Swokowski, E, Olinick ,M and Pence, D., Calculus, PWS Publishing Company - Boston, 1994
d) Periodicals, Web sites, etc	Web Sites related to Mathematics and Mathematical engineering as: www.math.hmc.edu, www.tutorial.math.lamar.edu, www.web.mit.edu

11- Facilities required for teaching and learning:

- Appropriate teaching design studios including presentation board, data show
- Google classroom
- E- learning

12- Requirements for Disable facilities:

- On line teaching hours if it is needed
- Extra examples and topic-specified research

Course coordinator:	Dr. Gamal El-Anani
program Coordinator	Dr. Ehab Mohamed Nabil Ismail Abdel Rasoul
Head of the Department	Dr. Ibrahim Ali Mahmoud Abdel Dayem
Date:	٢٠٢٣/٢٠٢٤