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

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

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	2022-2023

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).

1- program objectives served by the course:

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

OP5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies
OP6	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.
OP7	Teach students to use experimental and data analysis techniques for electrical power engineering applications

2- The relation between the course objectives and the program objectives

Course objectives		program objectives	
oc 1	Recognize the basic science for semiconductor materials, dropping, gap energy	OP5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies
oc 2	Recognize the diodes, types of Electronic Devices, properties of electronics devices,	OP6	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.
oc 3	Recognize the Operational Amplifiers, Amplifiers using Bipolar Junction Transistors (BJT's) & Field Effect Transistors (FET's).	OP6	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.

3- Learning outcomes of the course (LOs)

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

C(1.1)	Recognize the basic concepts of operational amplifier
C(2.1)	Recognize different types of field effect transistors
C(1.2,2.2)	Apply the fundamentals concepts of semiconductor materials
C(1.3)	Apply the basic knowledge of transformer
C(2.3,3.1)	Apply the knowledge of Bipolar junction transistor as a switch and as an amplifier
C(3.2,5.1)	Express the analysis of small and high frequency signal analysis for transistor

4- Program competencies served by the course:

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

CR1	Select, model and analyze electrical power systems applicable to the specific discipline by applying the concepts of: generation, transmission and distribution of electrical power systems.
CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.
CR3	Design and implement: elements, modules, sub-systems or systems in electrical/electronic/digital engineering using technological and professional tools.
CR5	Adopt suitable national and international standards and codes to: design, build, operate, inspect and maintain electrical/electronic/digital equipment, systems and services.

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

	Course (LOs)	program competencies	
C(1.1)	Recognize the basic concepts of operational amplifier	CR1	Select, model and analyze electrical power systems applicable to the specific discipline by applying the concepts of: generation, transmission and distribution of electrical power systems.
C(2.1)	Recognize different types of field effect transistors	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.
C(1.2,2.2)	Apply the fundamentals concepts of semiconductor materials	CR1	Select, model and analyze electrical power systems applicable to the specific discipline by applying the concepts of: generation, transmission and distribution of electrical power systems.
		CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.
C(1.3)	Apply the basic knowledge of transformer	CR1	Select, model and analyze electrical power systems applicable to the specific discipline by applying the concepts of: generation, transmission and distribution of electrical power systems.
C(2.3,3.1)	Apply the knowledge of Bipolar junction transistor	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and

	as a switch and as an amplifier		identify the tools required to optimize this design.
		CR3	Design and implement: elements, modules, sub-systems or systems in electrical/electronic/digital engineering using technological and professional tools.
C(3.2,5.1)	Express the analysis of small and high frequency signal analysis for transistor	CR3 CR5	Design and implement: elements, modules, sub-systems or systems in electrical/electronic/digital engineering using technological and professional tools. Adopt suitable national and international standards and codes to: design, build, operate, inspect and maintain electrical/electronic/digital equipment, systems and services.

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	C(1.1)
2	Understanding the basic concepts of operational amplifier	2	0	2	C(2.1)
3	Introduction to transformer	2	0	2	C(1.2,2.2)
4	Bipolar junction transistor as a switch	2	0	2	C(1.3)
5	Bipolar junction transistor as an amplifier	2	0	2	C(2.1)
6	Field effect transistor	2	0	2	C(1.2,2.2)
7	Metal oxide transistor	2	0	2	C(1.3)
8	Midterm		1.0		
9	Small and high frequency signal analysis for transistor	2	0	2	C(2.3,3.1)
10	Analysis Amplifier frequency response	2	0	2	C(3.2,5.1)
11	Introduction to electrical machine	2	0	2	C(1.2,2.2)
12	Design Dc Machinery concept and Dc - Motors	2	0	2	C(3.2,5.1)
13	Revision	2	0	2	C(1.1)
14	Small and high frequency signal analysis for transistor	2	0	2	C(2.3,3.1)
15	Small and high frequency signal analysis for transistor	2	0	2	C(2.3,3.1)
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
C(1.1)	✓												
C(2.1)	✓	✓											
C(1.2,2.2)	✓	✓	✓	✓	✓	✓	✓		✓	✓			✓
C(1.3)	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
C(2.3,3.1)	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
C(3.2,5.1)	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓

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
C(1.1)											
C(2.1)											
C(1.2,2.2)	✓	✓	✓	✓	✓	✓	✓		✓		✓
C(1.3)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
C(2.3,3.1)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
C(3.2,5.1)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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:	2022/2023

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

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	**2022-2023**

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

C- 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.

1- program objectives served by the course:

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

OP 6	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.

OP 7	Use experimental and data analysis techniques for electrical power engineering applications.
OP 9	Provide students with an awareness of the tools and skills necessary for participating effectively in building a robust national economy and meeting current and future modern industry needs.

2- The relation between the course objectives and the program objectives

Course objectives		program objectives	
oc 1	Recognize the functions and properties of instruments measuring system.	OP7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
oc 2	Recognize the error analysis of measurement methods.	OP7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
oc 3	Recognize the analogue and digital electric measurement devices (Oscilloscopes, signal generators, spectrum analyzer).	OP6	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.
		OP7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
oc 4	Recognize the functions and properties of instruments measuring system.	OP7	Teach students to use experimental and data analysis techniques for electrical power engineering applications

3- Learning outcomes of the course (LOs)

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

C(2.1,3.1)	Recognize the functions and properties of instruments measuring system.
C(2.2,3.2)	identify the system error analysis of measurement methods.
C(4.1)	Recognize with the analogue and digital electric measurement devices (Oscilloscopes, signal generators, spectrum analyzer).
C(4.2)	recognize with the computer systems for testing and measuring.
C(4.3,5.1)	Produce the comparative between systematic errors and gross errors.

C(4.4,5.2)	Produce the percentage of errors in electrical measurements.

4- Program competencies served by the course:

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

CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR 3	Design and implement: elements, modules, sub-systems or systems in electrical/electronic/digital engineering using technological and professional tools.
CR 4	Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation, and evaluate its suitability for a specific application.
CR 5	Adopt suitable national and international standards and codes to: design, build, operate, inspect and maintain electrical/electronic/digital equipment, systems and services.

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

Course (LOs)		program competencies	
C(2.1,3.1)	Recognize the functions and properties of instruments measuring system.	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
		CR 3	Design and implement: elements, modules, sub-systems or systems in electrical/electronic/digital engineering using technological and professional tools.
C(2.2,3.2)	Recognize the functions and properties of instruments measuring system.	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
		CR 3	Design and implement: elements, modules, sub-systems or systems in electrical/electronic/digital engineering using technological and professional tools.
C(4.1)	Recognize with the analogue and digital electric measurement devices (Oscilloscopes, signal generators, spectrum analyzer).	CR 4	Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation, and evaluate its suitability for a specific application.

C(4.2)	recognize with the computer systems for testing and measuring.	CR 4	Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation, and evaluate its suitability for a specific application.
C(4.3,5.1)	Produce the comparative between systematic errors and gross errors.	CR 4	Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation, and evaluate its suitability for a specific application.
		CR 5	Adopt suitable national and international standards and codes to: design, build, operate, inspect and maintain electrical/electronic/digital equipment, systems and services.
C(4.4,5.2)	Produce the comparative between systematic errors and gross errors.	CR 4	Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation, and evaluate its suitability for a specific application.
		CR 5	Adopt suitable national and international standards and codes to: design, build, operate, inspect and maintain electrical/electronic/digital equipment, systems and services.

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	Digital measurements Digital voltmeter–Digital ammeter –Digital ohmmeter	2	2	0	C(2.1, 3.1)
2	Measurements of current, voltage, resistance, frequency, time, amplitude and power	2	2	0	C(2.1, 3.1)
3	Accuracy of measurement and error analysis.	2	2	0	C(2.1, 3.1)
4	Quiz (1) + Absolute & secondary Error.	2	2	0	C(2.2 ,3.2)

5	Basic of statistical analysis.	2	2	0	C(4.1)
6	Electromechanical instruments.	2	2	0	C(4.1)
7	Permanent magnet moving coil construction.				C(4.1)
8	Midterm		1.0		
9	Galvanometer.	2	2	0	C(4.2)
10	Dc Ammeter.	2	2	0	C(4.2)
11	Multirange Ammeters.	2	2	0	C(4.3, 5.1)
12	Quiz (2) +solve example.	2	2	0	C(4.4 ,5.2)
13	DC Voltmeter Circuit.	2	2	0	C(4.2)
14	Rectifier Voltmeter.	2	2	0	C(4.3, 5.1)
15	Rectifier Ammeter.				C(4.2)
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
C(2.1,3.1)	✓												
C(2.2,3.2)	✓	✓											
C(4.1)	✓	✓	✓	✓	✓		✓		✓	✓			✓
C(4.2)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓
C(4.3,5.1)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓
C(4.4,5.2)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓

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

	Tools of assessment

Course ILOs	quizzes	Mid -term exam	Final exam	sheets/ sketches	projects	Practical: lab	Oral exam	discussions	Reports/ researches	presentation	modelling
C(2.1,3.1)											
C(2.2,3.2)											✓
C(4.1)	✓	✓	✓	✓	✓		✓		✓		✓
C(4.2)	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
C(4.3,5.1)	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
C(4.4,5.2)	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓

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	▪ Electronic Instrumentation and Measurements- 2nd Edition, David A. Bell
c) Recommend books	Mentioned at time.

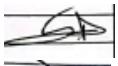
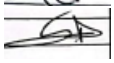
d) Periodicals, Web sites, etc	No periodicals are needed.

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:	2022/2023	

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

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	2022-2023

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- program objectives served by the course:

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

OP 7	Teach students to use experimental and data analysis techniques for electrical power engineering applications

OP 9	Provide students with an awareness of the tools and skills necessary for participating effectively in building a robust national economy and meeting current and future modern industry needs.

4- The relation between the course objectives and the program objectives

Course objectives		program objectives	
oc 1	Recognize the International System of Units (measurement system).	OP7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
oc 2	Recognize the units and demonstrate the ability to convert measurements.	OP7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
		OP 9	Provide students with an awareness of the tools and skills necessary for participating effectively in building a robust national economy and meeting current and future modern industry needs.
oc 3	Recognize the International System of Units (measurement system).	OP7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
		OP 9	Provide students with an awareness of the tools and skills necessary for participating effectively in building a robust national economy and meeting current and future modern industry needs.

5- Learning outcomes of the course (LOs)

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

C(4.1)	prepare the potentiometers to measure AC and DC values of unknown voltage.
C(4.2)	Use laboratory to measure the wattmeter and energy meter to measure power and energy.
C(4.3)	Use laboratory to measure high values of current and voltage.
C(2.1,3.1)	Use laboratory to measure voltage and Current.
C(2.2,3.2)	Prepare the bridges for the measurement of low, medium and high resistance.
C(2.3,3.3,4.4,5.1)	Communicate effectively with the bridges for the measurement of inductance and capacitance measurement.

6- Program competencies served by the course:

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

CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR 3	Design and implement: elements, modules, sub-systems or systems in electrical/electronic/digital engineering using technological and professional tools.
CR 4	Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation, and evaluate its suitability for a specific application
CR 5	Adopt suitable national and international standards and codes to: design, build, operate, inspect and maintain electrical/electronic/digital equipment, systems and services.

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

Course (LOs)		program competencies	
C(4.1)	prepare the potentiometers to measure AC and DC values of unknown voltage.	CR 4	Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation, and evaluate its suitability for a specific application
C(4.2)	Use laboratory to measure the wattmeter and energy meter to measure power and energy.	CR 4	Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation, and evaluate its suitability for a specific application
C(4.3)	Use laboratory to measure high values of current and voltage.	CR 4	Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation, and evaluate its suitability for a specific application
C(2.1,3.1)	Use laboratory to measure voltage and Current. Prepare the bridges for the measurement of low,	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design

C(2.2,3.2)	medium and high resistance.	CR 3	Design and implement: elements, modules, sub-systems or systems in electrical/electronic/digital engineering using technological and professional tools.
	Communicate effectively with the bridges for the measurement of inductance and capacitance measurement.	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
	prepare the potentiometers to measure AC and DC values of unknown voltage.	CR 3	Design and implement: elements, modules, sub-systems or systems in electrical/electronic/digital engineering using technological and professional tools.
		CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
C(2.3,3.3,4.4,5.1)	Use laboratory to measure the wattmeter and energy meter to measure power and energy.	CR 3	Design and implement: elements, modules, sub-systems or systems in electrical/electronic/digital engineering using technological and professional tools.
		CR 4	Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation, and evaluate its suitability for a specific application
		CR 5	Adopt suitable national and international standards and codes to: design, build, operate, inspect and maintain electrical/electronic/digital equipment, systems and services.

8- 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	C(4.1)
2	Measurement of the Low Resistance.	0	0	2	C(4.1)
3	Sensitive Voltage/Audio Detector.	0	0	2	C(4.1)
4	Voltmeter usage.	0	0	2	C(4.2)
5	Ohmmeter usage.	0	0	2	C(4.3)

6	A very simple circuit.	0	0	2	C(4.3)
7	Ammeter usage.	0	0	2	C(4.3)
8	Midterm		1.0		
9	DC and AC bridges.	0	0	2	C(2.1,3.1)
10	Ohm's law.	0	0	2	C(2.1,3.1)
11	Nonlinear resistance.	0	0	2	C(2.2,3.2)
12	DC Voltmeter Circuit.	0	0	2	C(2.2,3.2)
13	Multirange Ammeters.	0	0	2	C(2.3,3.3,4.4,5.1)
14	Rectifier Voltmeter.	0	0	2	C(2.1,3.1)
15	Rectifier Ammeter.	0	0	2	C(2.2,3.2)
16	Final Exam		2.0		
Total hours		0	0	28	--

9- 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
C(4.1)	✓	✓	✓			✓	✓			✓	✓	✓	
C(4.2)	✓	✓	✓			✓	✓			✓	✓	✓	
C(4.3)	✓	✓	✓			✓	✓			✓	✓	✓	
C(2.1,3.1)	✓	✓	✓			✓	✓			✓	✓	✓	
C(2.2,3.2)	✓	✓	✓			✓	✓			✓	✓	✓	
C(2.3,3.3,4.4,5.1)	✓	✓	✓			✓	✓			✓	✓	✓	

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.

10- 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

C(4.1)		✓	✓	✓	✓	✓	✓	✓		✓	
C(4.2)		✓	✓	✓	✓	✓	✓	✓		✓	
C(4.3)		✓	✓	✓	✓	✓	✓	✓		✓	
C(2.1,3.1)		✓	✓	✓	✓	✓	✓	✓		✓	
C(2.2,3.2)		✓	✓	✓	✓	✓	✓	✓		✓	
C(2.3,3.3,4.4,5.1)		✓	✓	✓	✓	✓	✓	✓		✓	

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%	40 marks	(60) marks
Sheets and Sketches	70%		
Researches and reports	0%		
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

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

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:	2022/2023

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	2022-2023

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- Professional information

1- 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].

2- program objectives served by the course:

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

OP 5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies.
OP 6	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.
OP 9	Provide students with an awareness of the tools and skills necessary for participating effectively in building a robust national economy and meeting current and future modern industry needs
OP 12	Prepare engineers who can work on electrical power systems, including designing and realizing such systems.

3- The relation between the course objectives and the program objectives

	Course objectives	program objectives	
oc 1	Recognize the analysis of signals that includes.	OP 5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies.
oc 2	Recognize the physical meaning of signals Classify the different kinds of signals.	OP 5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies.
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.	OP 5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies.

oc 4	Recognize the main elements required to convert the signal from analog to digital that includes: [Sampling, Quantization, and coding]. Recognize and discriminate between Convolution, and Correlation of signals.	OP 5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies.
		OP 6	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.
oc 5	Recognize the basic operations of signals [Addition, multiplication, Shifting, reflection, amplitude scaling, and time scaling].	OP 5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies.
		OP 6	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.
oc 6	Recognize the analysis of signals that includes. Recognize the physical meaning of signals Classify the different kinds of signals.	OP 9	Provide students with an awareness of the tools and skills necessary for participating effectively in building a robust national economy and meeting current and future modern industry needs
		OP 12	Prepare engineers who can work on electrical power systems, including designing and realizing such systems.
oc 7	Recognize the different applications of signals. Know the Elementary or basic signals [unit-step function, Ramp function, unit impulse function, sampling function, complex exponential,	OP 9	Provide students with an awareness of the tools and skills necessary for participating effectively in building a robust national economy and meeting current and future modern industry needs

	Sinc signal, Gate signal, and signum signal] and understand and analyze the Sampling theory.	OP 12	Prepare engineers who can work on electrical power systems, including designing and realizing such systems.

4- Learning outcomes of the course (LOs)

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

C(1.1)	Identify the different types of signals.
C(1.2)	Recognize the basic principles of the properties of the signal.
C(2.1)	evaluate the mathematical method to derive frequency domain of the continuous signal.
C(2.2)	Apply knowledge to recognize the effect of continuous input signal on the system.
C(1.3)	Express effectively with the frequency components of the discrete signal

5- Program competencies served by the course:

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

CR1	Select, model and analyze electrical power systems applicable to the specific discipline by applying the concepts of: generation, transmission and distribution of electrical power systems.
CR 2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.

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

Course (LOs)		program competencies	
C(1.1)	Identify the different types of signals.	CR1	Select, model and analyze electrical power systems applicable to the specific discipline by applying the concepts of: generation, transmission and distribution of electrical power systems.
C(1.2)	Recognize the basic principles of the properties of the signal.	CR1	Select, model and analyze electrical power systems applicable to the specific discipline by applying the concepts of: generation, transmission and distribution of electrical power systems.
C(2.1)	evaluate the mathematical method to derive frequency domain of the continuous signal.	CR 2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.

C(2.2)	Apply knowledge to recognize the effect of continuous input signal on the system.	CR 2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.
C(1.3)	Express effectively with the frequency components of the discrete signal	CR1	Select, model and analyze electrical power systems applicable to the specific discipline by applying the concepts of: generation, transmission and distribution of electrical power systems.

7- 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	C(1.1)
2	Signal Types	2	2	0	C(1.1)
3	System Classification	2	2	0	C(1.1)
4	Convolution	2	2	0	C(1.2)
5	Convolution	2	2	0	C(1.2)
6	Fourier series	2	2	0	C(2.1)
7	Fourier transform	2	2	0	C(2.1)
8	Midterm		1.0		
9	Fourier transform	2	2	0	C(2.1)
10	Discrete Fourier Transform	2	2	0	C(2.2)
11	Discrete Fourier Transform	2	2	0	C(2.2)
12	Laplace Transform	2	2	0	C(2.2)
13	Laplace Transform Cont.	2	2	0	(1.3)
14	Sampling Process	2	2	0	(1.3)
15	Sampling Process	2	2	0	(1.3)
16	Final Exam		2.0		
Total hours		28	28	0	--

8- 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
C(1.1)	✓												
C(1.2)	✓	✓											
C(2.1)	✓	✓	✓	✓	✓		✓		✓	✓			✓
C(2.2)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓
C(1.3)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓

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.

9- 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
C(1.1)											
C(1.2)											
C(2.1)	✓	✓	✓	✓	✓		✓		✓		✓
C(2.2)	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
C(1.3)	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓

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:	2022/2023

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	2022-2023

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- program objectives served by the course:

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

OP 6	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.
OP 7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
OP 12	Prepare engineers who can work on electrical power systems, including designing and realizing such systems.

4- The relation between the course objectives and the program objectives

	Course objectives	program objectives	
oc 1	explain the computer Evolution and Performance. explain the computer interconnection structures.	OP 6	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.
		OP 7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
oc 2	Recognize the study for the Organization and Architecture Recognize the study for Computer arithmetic and Instruction sets memories.	OP 6	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.
		OP 7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
oc 3	Recognize for the CPU structure and function.	OP 6	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of

			electrical components, circuits, and systems.
		OP 7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
oc 4	explain the computer Evolution and Performance. explain the computer interconnection structures.	OP 6	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.
		OP 7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
Oc5	Recognize the study for the Organization and Architecture	OP 12	Prepare engineers who can work on electrical power systems, including designing and realizing such systems.
oc6	Recognize the study for Computer arithmetic and Instruction sets memories.	OP 12	Prepare engineers who can work on electrical power systems, including designing and realizing such systems.

5- Learning outcomes of the course (LOs)

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

CR(2.1) Recognize the Organization and Architecture and Computer Evolution and Performance.

CR(2.2) Recognize the Computer interconnection structures Internal memory.

CR(2.3) Recognize the External memory and Input / output and Computer arithmetic and Instruction sets.

CR(2.4) Prepare the CPU structure and function.

CR(2.5) Conduct and develop with Cache memory and Interrupt.

CR(3.1)	Communicate Effectively with Short and long I/O Wait Interrupt.

6- Program competencies served by the course:

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

CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR3	Design and implement: elements, modules, sub-systems or systems in electrical/electronic/digital engineering using technological and professional tools.

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

Course (LOs)		program competencies	
CR(2.1)	Recognize the Organization and Architecture and Computer Evolution and Performance.	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR(2.2)	Recognize the Computer interconnection structures Internal memory.	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR(2.3)	Recognize the External memory and Input / output and Computer arithmetic and Instruction sets.	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR(2.4)	Prepare the CPU structure and function.	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR(2.5)	Conduct and develop with Cache memory and Interrupt.	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR(3.1)	Communicate Effectively with Short and long I/O Wait Interrupt.	CR3	Design and implement: elements, modules, sub-systems or systems in electrical/electronic/digital engineering using technological and professional tools.

8- 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	CR(2.1)
2	Computer evolution and performance	2	0	2	CR(2.1)
3	Internal memory	2	0	2	CR(2.2)
4	External memory	2	0	2	CR(2.3)
5	Input/output	2	0	2	CR(2.3)
6	Computer arithmetic and instruction sets	2	0	2	CR(2.3)
7	CPU structure and function	2	0	2	CR(2.4)
8	Mid-term Exam		2.0		
9	Cache memory	2	0	2	CR(2.5)

10	Interrupt	2	0	2	CR(2.5)
11	Interrupt types	2	0	2	CR(2.5)
12	Input/output programs	2	0	2	CR(3.1)
13	Short and long I/O wait interrupts	2	0	2	CR(3.1)
14	Input/output programs - Interrupt types	2	0	2	CR(3.1)
15	Short and long I/O wait interrupts	2	0	2	CR(3.1)
16	Final Exam		2.0		
Total hours		28	0	28	--

9- 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
CR(2.1)	✓												
CR(2.2)	✓	✓											
CR(2.3)	✓	✓	✓	✓	✓		✓		✓	✓			✓
CR(2.4)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓
CR(2.5)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓
CR(3.1)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓

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.

10- 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

CR(2.1)												
CR(2.2)												
CR(2.3)	✓	✓	✓	✓	✓			✓		✓		✓
CR(2.4)	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓
CR(2.5)	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓
CR(3.1)	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓

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:

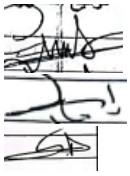
- Appropriate teaching design studios including presentation board, data show
- Google classroom
- E- learning

12- Requirements for Disable facilities:

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

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

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:	2022/2023



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	2022-2023

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- program objectives served by the course:

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

OP 5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies.
OP 6	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.
OP 12	Prepare engineers who can work on electrical power systems, including designing and realizing such systems.

4- The relation between the course objectives and the program objectives

	Course objectives	program objectives	
oc 1	Recognize the importance of feasibility studies for projects.	OP 5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies.
oc 2	Recognize the definition of feasibility study and historical development of interest.	OP 6	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.
oc 3	Recognize with feasibility studies and their components.	OP 6	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.
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.	OP 12	Prepare engineers who can work on electrical power systems, including designing and realizing such systems.
oc 5	Recognize on making feasibility study evaluation for projects	OP 12	Prepare engineers who can work on electrical power systems, including designing and realizing such systems.

5- Learning outcomes of the course (LOs)

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

C(1.1)	Identify the nature of the project, its components and forms.

C(2.1)	Recognize the preliminary feasibility studies and their components.
C(1.2,5.1)	Recognize the effects of environmental feasibility studies.
C(2.2)	Use tools to produce the effect of social feasibility study on mega projects.
C(1.3,3.1)	Utilize feasibility study evaluation methods to making feasibility reports
C(2.3,5.2,9.1)	prepare cash flow diagrams for projects and studying its effects on the feasibility of projects.

6- Program competencies served by the course:

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

C1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.
C2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.
C3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development
C5	Practice research techniques and methods of investigation as an inherent part of learning.
C9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations

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

Course (LOs)		program competencies	
C(1.1)	Identify the nature of the project, its components and forms.	C1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.
C(2.1)	Recognize the preliminary feasibility studies and their components.	C2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.
C(1.2,5.1)	Use tools to produce the effect of social	C1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.

	feasibility study on mega projects. Utilize feasibility study evaluation methods to making feasibility reports	C5	Practice research techniques and methods of investigation as an inherent part of learning.
C(2.2)	prepare cash flow diagrams for projects and studying its effects on the feasibility of projects.	C2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.
C(1.3,3.1)	Use tools to produce the effect of social feasibility study on mega projects. Identify the nature of the project, its components and forms.	C1 C3	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development
C(2.3,5.2,9.1)	Recognize the preliminary feasibility studies and their components.	C2 C5 C9	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions. Practice research techniques and methods of investigation as an inherent part of learning. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations

8- 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	C(1.1)
2	Definition of feasibility study and historical development of interest.	2	2	0	C(2.1,1.2,5.1)
3	The nature of the project, its components and forms.	2	2	0	C(2.1,1.2,5.1)
4	Preliminary feasibility studies and their components.	2	2	0	C(1.1,2.3,5.2,9.1)
5	Environmental feasibility studies + Quiz (1)	2	2	0	C(1.1, 2.1,1.2,5.1)
6	Environmental feasibility studies.	2	2	0	C(2.1)
7	Making cash flow diagram for construction projects				C(2.3,5.2,9.1)
8	Midterm		1.0		
9	A social feasibility study design criterion.	2	2	0	C(2.1)
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	C(2.1)
11	The most important financing aspects in the feasibility study: preparing financial statements, financial obligations on the project, and financial incentives for projects	2	2	0	C(2.2, 1.3,3.1)
12	Technical and engineering feasibility of the project	2	2	0	C(2.2, 1.3,3.1)
13	Feasibility study evaluation methods. + Quiz (2)	2	2	0	C(1.2,5.1,2.2,1.3,3.1, 2.3,5.2,9.1)
14	Feasibility study evaluation methods.	2	2	0	C(2.1)
15	Revision				C(1.1, 2.1,1.2,5.1,2.2,1.3,3.1, 2.3,5.2,9.1)
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	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	modeling
C(1.1)	√	√	√	√					√	√	√		
C(2.1)	√	√	√	√	√				√		√	√	√
C(1.2,5.1)	√	√	√	√	√				√		√	√	
C(2.2)	√	√	√	√					√	√	√		
C(1.3,3.1)	√	√	√	√	√				√		√	√	√
C(2.3,5.2,9.1)	√		√							√			

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
C(1.1)	√	√	√	√	√				√		
C(2.1)	√	√	√	√	√			√	√	√	√
C(1.2,5.1)	√		√	√	√			√	√	√	
C(2.2)	√	√	√	√	√				√		
C(1.3,3.1)	√		√	√	√			√	√	√	√
C(2.3,5.2,9.1)	√	√	√		√						

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)	(10) marks	(30) marks

	Quiz (2)	(10) marks
Sheets and Sketches	(50) %	
Reports	(10) %	(٥) 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

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:	2022/2023

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	2022-2023

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- program objectives served by the course:

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

OP 1	The course introduces students to some important statistical concepts and techniques that are of common application in engineering.
OP 2	Covers graphical and numerical summaries of data, plotting data, probabilities of random events
OP 3	Random variables, properties of density and distribution functions, measures of location and dispersion
OP 4	Expected values, independence of random variables, scaling and adding random variables, the binomial Poisson and normal distributions
OP 5	The central limit theorem, hypothesis testing, confidence intervals, t test, paired t test, standard errors, least squares, residuals
OP 6	Correlation, examples of regression, quality control,
OP 7	Clustering of rare events.

4- The relation between the course objectives and the program objectives

	Course objectives		program objectives
oc 1	Recognize some important statistical	OP 1	The course introduces students to some important statistical concepts and techniques that are of common application in engineering.
oc 2	Recognize graphical and numerical summaries of data.	OP 2	Covers graphical and numerical summaries of data, plotting data, probabilities of random events
oc 3	used to apply knowledge of mathematics to distribution functions, measures	OP 3	Random variables, properties of density and distribution functions, measures of location and dispersion
oc 4	Recognize the concepts of expected values	OP 4	Expected values, independence of random variables, scaling and adding random variables, the binomial Poisson and normal distributions
oc 5	Describe and analyze data, to Deal with design situations within solving design problems based on the	OP 5	The central limit theorem, hypothesis testing, confidence intervals, t test, paired t test, standard errors, least squares, residuals

	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,	OP 6	Correlation, examples of regression, quality control,
oc 7	apply knowledge of Theory of equations, and clustering of rare events. to solve engineering problems.	OP 7	Clustering of rare events.

5- Learning outcomes of the course (LOs)

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

C(1.1)	Explain concepts and theories of mathematics and sciences, appropriate to Probability & Statistics
C(1.2)	Demonstrate methodologies of solving engineering problems, data collection and interpretation
C(1.3)	Select appropriate solutions for engineering problems based on analytical thinking
C(2.1)	Apply knowledge of mathematics to solve engineering problems.
C(1.4)	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.
C(2.2)	Solve the tutorial classroom with the demonstrator and effectively manages tasks, time, and resources, when solving mathematics problems, and in exams.
C(1.5, 2.3)	Apply knowledge of mathematics to solve differential problems

6- Program competencies served by the course:

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

C1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics
C2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions

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

Course (LOs)		program competencies	
C(1.1)	Explain concepts and theories of mathematics and sciences, appropriate to Probability & Statistics	C1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics

C(1.2)	Demonstrate methodologies of solving engineering problems, data collection and interpretation	C1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics
C(1.3)	Select appropriate solutions for engineering problems based on analytical thinking	C1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics
C(2.1)	Apply knowledge of mathematics to solve engineering problems.	C2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions
C(1.4)	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.	C1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics
C(2.2)	Solve the tutorial classroom with the demonstrator and effectively manages tasks, time, and resources, when solving mathematics problems, and in exams.	C2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions
C(1.5, 2.3)	Apply knowledge of mathematics to solve differential problems	C1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics
		C2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions

8- 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	C(1.1,1.2)
2	Techniques that are of common application in engineering.	2	2	0	C(1.1,1.3)
3	Covers graphical and numerical summaries of data.	2	2	0	C(2.1, 1.4)
4	Plotting data, probabilities of random events.	2	2	C(2.1)	C(1.2, 2.1)
5	Random variables, properties of density and distribution functions	2	2	0	C(1.2, 2.1)
6	Measures of location and dispersion	2	2	0	C(1.2, 2.1)
7	Expected values, independence of random variables				C(2.1)
8	Midterm	1.0			
9	Scaling and adding random variables, the binomial Poisson, and normal distributions	2	2	0	C(1.2, 2.1)
10	The central limit theorem, hypothesis testing, confidence intervals	2	2	0	C(1.2, 2.1)
11	Test, paired t test, standard errors,	2	2	0	C(1.2, 1.4)
12	Least squares, residuals	2	2	0	C(1.2, 2.1
13	Correlation, examples of regression, quality control,	2	2	0	C(1.2, 2.1)
14	Clustering of rare events.	2	2	0	C(1.2, 2.1)
15	Revision				C(1.2, 2.1,1.4)
16	Final Exam	2.0			
Total hours		28	28	0	--

9- 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
C(1.1)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	
C(1.2)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	
C(1.3)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	
C(2.1)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	
C(1.4)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	
C(2.2)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	

C(1.5, 2.3)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	

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.

10- 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
C(1.1)	✓	✓	✓	✓				✓	✓	✓	
C(1.2)	✓	✓	✓	✓				✓	✓	✓	
C(1.3)	✓	✓	✓	✓				✓	✓	✓	
C(2.1)	✓	✓	✓	✓				✓	✓	✓	
C(1.4)	✓	✓	✓	✓				✓	✓	✓	
C(2.2)	✓	✓	✓	✓				✓	✓	✓	
C(1.5, 2.3)	✓	✓	✓	✓				✓	✓	✓	

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	(50) marks
	Quiz (2)	(5) marks	
Discussions	25%		
Sheets and Sketches	50%	10 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. ▪ 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.
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:	2022/2023

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	2022-2023

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:

oc 1	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- program objectives served by the course:

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

OP 5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies.

OP 6	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.
OP 7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
OP 12	Prepare engineers who can work on electrical power systems, including designing and realizing such systems.

4- The relation between the course objectives and the program objectives

	Course objectives	program objectives	
oc 1	Recognize the State-space modelling and analysis.	OP 5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies.
oc 2	Recognize the Automatic controllability, and observability	OP 5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies.
oc 3	Recognize the state feedback design and pole placement	OP 6	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.
		OP 7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
oc 4	Recognize the State-space modelling and analysis.	OP 12	Prepare engineers who can work on electrical power systems, including designing and realizing such systems.

5- Learning outcomes of the course (LOs)

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

CR(1.1)	Recognize the the control system and its components.
CR(1.2)	Recognize the Automatic State-space modelling and analysis
CR(1.3)	Recognize the open loop, closed control system, state feedback design and pole placement
CR(1.4,2.1)	Recognize the Design and operation of understanding the ways of implementation control system techniques.

CR(1.5, 2.2)	Use tools the Convert the controlled closed loop in simplest form.

6- Program competencies served by the course:

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

CR1	Select, model, and analyze electrical power systems applicable to the specific discipline by applying the concepts of generation, transmission, and distribution of electrical power systems.
CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.

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

Course (LOs)		program competencies	
CR(1.1)	Recognize the the control system and its components.	CR1	Select, model, and analyze electrical power systems applicable to the specific discipline by applying the concepts of generation, transmission, and distribution of electrical power systems.
CR(1.2)	Recognize the Automatic State-space modelling and analysis	CR1	Select, model, and analyze electrical power systems applicable to the specific discipline by applying the concepts of generation, transmission, and distribution of electrical power systems.
CR(1.3)	Recognize the open loop, closed control system, state feedback design and pole placement	CR1	Select, model, and analyze electrical power systems applicable to the specific discipline by applying the concepts of generation, transmission, and distribution of electrical power systems.
CR(1.4,2.1)	Recognize the Design and operation of understanding the ways of implementation control system techniques.	CR1	Select, model, and analyze electrical power systems applicable to the specific discipline by applying the concepts of generation, transmission, and distribution of electrical power systems.
		CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.

CR(1.5, 2.2)	Use tools the Convert the controlled closed loop in simplest form.	CR1	Select, model, and analyze electrical power systems applicable to the specific discipline by applying the concepts of generation, transmission, and distribution of electrical power systems.
		CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.

8- 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	CR(1.1)
2	State-space modelling and analysis	2	2	0	CR(1.1)
3	Focuses on Automatic Controllability + Solved examples+ Quiz (1).	2	2	0	CR(1.1)
4	Quiz (1) +Automatic Observability.	2	2	0	CR(1.2)
5	Focuses on state feedback design + solved examples.	2	2	0	CR(1.3)
6	Focuses on Pole placement.	2	2	0	CR(1.3)
7	Dynamic observers.				CR(1.3)
8	Midterm		1.0		
9	Focuses on Static characteristic for controlled system	2	2	0	CR(1.2)
10	The principle of open loop control system	2	2	0	CR(1.3)
11	Focuses on Output feedback design.	2	2	0	CR(1.5, 2.2)
12	Quiz (2)	2	2	0	CR(1.4,2.1)
13	Focuses on Stability Analysis	2	2	0	CR(1.5, 2.2)
14	Focuses on Special Topics.	2	2	0	CR(1.5, 2.2)
15	Focuses on solved examples in controlled system .				CR(1.3)
16	Final Exam		2.0		
Total hours		28	28	0	--

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

Course learning Outcomes (LOs)	Teaching and Learning Methods												
	Online / 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
CR(1.1)	✓												
CR(1.2)	✓	✓											
CR(1.3)	✓	✓	✓	✓	✓		✓		✓	✓			✓
CR(1.4, 2.1)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓
CR(1.5, 2.2)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓

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.

10- 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
CR(1.1)											
CR(1.2)											
CR(1.3)	✓	✓	✓	✓	✓		✓		✓		✓
CR(1.4,2.1)	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
CR(1.5, 2.2)	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓

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

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

Head of the Department	Dr. Ibrahim Ali Mahmoud Abdel Dayem
Date:	2022/2023

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	2022-2023

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- program objectives served by the course:

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

OP 5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies.

OP 6	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.
OP 7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
OP 12	Prepare engineers who can work on electrical power systems, including designing and realizing such systems.

4- The relation between the course objectives and the program objectives

	Course objectives	program objectives	
oc 1	Recognize the control system and its components.	OP 5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies.
oc 2	Recognize the control Automatic temperature control using a two-position controller with and without hysteresis	OP 6	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.
oc 3	Recognize the principle of open loop and closed control system	OP 5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies.
		OP 7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
oc 4	Recognize the control system and its components.	OP 12	Prepare engineers who can work on electrical power systems, including designing and realizing such systems.

5- Learning outcomes of the course (LOs)

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

CR(2.1)	Prepare the control system and its components.
CR(2.2)	Apply acknowledge with Automatic temperature control using a two-position controller with and without hysteresis.
CR(2.3)	Prepare the open loop and closed control system
CR(2.4)	Prepare, Design, and operation of p-action controller, and Static characteristic for controlled system.
CR(2.5)	Communicate effectively with controlled closed loop in simplest form.

6- Program competencies served by the course:

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

CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design

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

Course (LOs)		program competencies	
CR(2.1)	Prepare the control system and its components.	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR(2.2)	Apply acknowledge with Automatic temperature control using a two-position controller with and without hysteresis.	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR(2.3)	Prepare the open loop and closed control system	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR(2.4)	Prepare, Design, and operation of p-action controller, and Static characteristic for controlled system.	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR(2.5)	Communicate effectively with controlled closed loop in simplest form.	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design

8- 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	CR(2.1)
2	Parameter for temperature-controlled system	0	0	2	CR(2.1)
3	Focuses on Automatic temperature control of sauna + Solved examples.	0	0	2	CR(2.1)
4	Automatic temperature control using a two-position controller with hysteresis.	0	0	2	CR(2.2)
5	Focuses on Calibration of temperature sensor + solved examples.	0	0	2	CR(2.3)
6	Focuses on Two position (2-state) controller without hysteresis.	0	0	2	CR(2.3)
7	Disturbance response for a two-position controller.	0	0	2	CR(2.3)
8	Midterm		1.0		

9	Focuses on Static characteristic for controlled system	0	0	2	CR(2.2)
10	The principle of open loop control system	0	0	2	CR(2.3)
11	Focuses on Design and operation of p-action controller.	0	0	2	CR(2.5)
12	Focuses on Design and operation of p-action controller.	0	0	2	CR(2.4)
13	Focuses on project objective	0	0	2	CR(2.5)
14	Focuses on Special Topics.	0	0	2	CR(2.5)
15	Focuses on solved examples in controlled system.	0	0	2	CR(2.3)
16	Final Exam		2.0		
Total hours		0	0	28	--

9- 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
CR(2.1)	✓	✓	✓			✓	✓			✓	✓	✓	
CR(2.2)	✓	✓	✓			✓	✓			✓	✓	✓	
CR(2.3)	✓	✓	✓			✓	✓			✓	✓	✓	
CR(2.4)	✓	✓	✓			✓	✓			✓	✓	✓	
CR(2.5)	✓	✓	✓			✓	✓			✓	✓	✓	

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.

10- 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
CR(2.1)		✓	✓	✓	✓	✓	✓	✓		✓	
CR(2.2)		✓	✓	✓	✓	✓	✓	✓		✓	
CR(2.3)		✓	✓	✓	✓	✓	✓	✓		✓	
CR(2.4)		✓	✓	✓	✓	✓	✓	✓		✓	
CR(2.5)		✓	✓	✓	✓	✓	✓	✓		✓	

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%		
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	▪ 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.

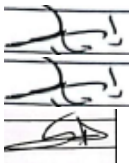
11- Facilities required for teaching and learning:

- 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:	2022/2023



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- program objectives served by the course:

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

OP 5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies.
OP 6	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.
OP 7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
OP9	Provide students with an awareness of the tools and skills necessary for participating

4- The relation between the course objectives and the program objectives

	Course objectives	program objectives	
oc 1	Recognize the principles of the feedback.	OP 5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies.
oc 2	Recognize the present techniques of wave shaping and generation.	OP 6	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.
oc 3	Recognize the operation and application of differential amplifier.	OP 5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies.
oc 4	Recognize some special purpose Analog IC – like 555-timer and PLL.	OP 7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
oc 5	Recognize the voltage and current relationships in transmission lines and operation characteristics.	OP9	Provide students with an awareness of the tools and skills necessary for participating

oc6	Recognize the fundamental skills to understand the basic of semiconductor and components like diode, Transistor, MOSFET and operational	OP 5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies.
		OP9	Provide students with an awareness of the tools and skills necessary for participating

5- Learning outcomes of the course (LOs)

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

CR(1.1)	Describe the current engineering technologies as related to the electronics.
CR(1.2, 2.1)	apply appropriate scientific principles mathematical and computer-based methods for analysing generation electronic engineering system
CR(2.2, 3.1)	Develop the creative thinking for resolving and innovative solutions for the practical industrial problems
CR(3.2,5.1)	Apply knowledge to Assess and evaluate the characteristics and performance of analogue electronic circuits
CR(3.3, 5.2)	Communicate effectively with the mathematics of analogue electronics design integrally to solve engineering problems

6- Program competencies served by the course:

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

CR1	Select, model, and analyze electrical power systems applicable to the specific discipline by applying the concepts of generation, transmission, and distribution of electrical power systems.
CR 2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR 3	Design and implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.
CR 5	Adopt suitable national and international standards and codes to design, build, operate, inspect, and maintain electrical/electronic/digital equipment, systems, and services.

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

Course (LOs)		program competencies	
CR(1.1)	Describe the current engineering technologies as related to the electronics.	CR1	Select, model, and analyze electrical power systems applicable to the specific discipline by applying the concepts of generation, transmission, and distribution of electrical power systems.
CR(1.2, 2.1)	apply appropriate scientific principles mathematical and computer-based methods for analysing generation electronic engineering system	CR1	Select, model, and analyze electrical power systems applicable to the specific discipline by applying the concepts of generation, transmission, and distribution of electrical power systems.
	Develop the creative thinking for resolving and innovative solutions for the practical industrial problems	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR(2.2, 3.1)	Apply knowledge to Assess and evaluate the characteristics and performance of analogue electronic circuits	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
		CR 3	Design and implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.
CR(3.2,5.1)	Describe the current engineering technologies as related to the electronics.	CR 3	Design and implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.
	apply appropriate scientific principles mathematical and computer-based methods for analysing generation electronic engineering system	CR 5	Adopt suitable national and international standards and codes to design, build, operate, inspect, and maintain electrical/electronic/digital equipment, systems, and services.

CR(3.3, 5.2)	Develop the creative thinking for resolving and innovative solutions for the practical industrial problems	CR 3	Design and implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.
		CR 5	Adopt suitable national and international standards and codes to design, build, operate, inspect, and maintain electrical/electronic/digital equipment, systems, and services.

8- 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	CR(1.1)
2	Frequency response of one stage amplifiers	2	0	2	CR(1.1)
3	Bypass capacitors.	2	0	2	CR(1.1)
4	Emitter and source follower.	2	0	2	CR(1.2, 2.1)
5	Input and output amplifiers& quiz	2	0	2	CR(2.2, 3.1)
6	Multistage amplifiers	2	0	2	CR(2.2, 3.1)
7	Coupling between stage.	2	0	2	CR(3.2,5.1)
8	Midterm		1.0		
9	Operational amplifiers	2	0	2	CR(3.3, 5.2)
10	Properties of OP-AMPS	2	0	2	CR(3.3, 5.2)
11	Simple analog computers & quiz	2	0	2	CR(3.3, 5.2)
12	Comparator Schmitt trigger.	2	0	2	CR(3.3, 5.2)
13	Sample and hold	2	0	2	CR(3.3, 5.2)
14	Properties of OP-AMPS	2	0	2	CR(3.3, 5.2)
15	Properties of OP-AMPS	2	0	2	CR(3.3, 5.2)
16	Final Exam		2.0		
Total hours		28	0	28	--

9- 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
CR(1.1)	✓												
CR(1.2, 2.1)	✓	✓											
CR(2.2, 3.1)	✓	✓	✓	✓	✓	✓	✓		✓	✓			✓
CR(3.2, 5.1)	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
CR(3.3, 5.2)	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓

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.

10- 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
CR(1.1) CR(1.2, 2.1)											

CR(2.2, 3.1)	✓	✓		✓	✓	✓	✓	✓		✓	✓
CR(3.2,5 .1)	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
CR(3.3, 5.2)	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓

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

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

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:	2022/2023

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

Course specification

Course code:	Course name
CECE 312	Electronics 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	2022-2023

B- 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

3- 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.

4- program objectives served by the course:

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

OP 7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
OP 9	The students will gain familiarity with the tools and skills necessary for participating effectively in building a robust national economy and meeting current and future modern industry needs.

1- The relation between the course objectives and the program objectives

	Course objectives	program objectives	
oc 1	Recognize and verify the network theorems and operation of typical electronics circuits.	OP 7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
oc 2	Recognize how to used the various stages of a Zener diode based regulated power supply.	OP 7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
oc 3	Recognize various biasing concepts, BJT based amplifiers.	OP 7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
oc 4	Recognize diode and it‘s applications in clipping and clamping circuits, Rectifiers and design regulated power supply using Zener diodes.	OP 7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
oc 5	Recognize how plot the current voltage characteristics of Diode, Transistors, and its different biasing conditions.	OP 7 OP 9	Teach students to use experimental and data analysis techniques for electrical power engineering applications The students will gain familiarity with the tools and skills necessary for participating effectively in building a robust national economy and meeting current and future modern industry needs.
oc6	Recognize and verify the network theorems and operation of typical electronics circuits.	OP 7	Teach students to use experimental and data analysis techniques for electrical power engineering applications

	OP 9	The students will gain familiarity with the tools and skills necessary for participating effectively in building a robust national economy and meeting current and future modern industry needs.

5- Learning outcomes of the course (LOs)

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

CR(1.1)	Apply acknowledge in a systematic manner suitable for analysis and design and further analyze the electric circuit using network theorems.
CR(2.1)	Use laboratory to identify the different types of semiconductor devices and their characteristics.
CR(2.2, 3.1)	Apply acknowledge to deal with transistors, transistor-based amplifiers, and its biasing.
CR(2.3,3.2)	Apply acknowledge to deal with the concepts of feedback and oscillations and construct feedback amplifiers
CR(3.3, 5.1)	Communicate effectively with the analogue electronics design integrally to solve engineering problems.

6- Program competencies served by the course:

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

CR1	Select, model and analyze electrical power systems applicable to the specific discipline by applying the concepts of: generation, transmission and distribution of electrical power systems.
CR 2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR 3	Design and implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.
CR 5	Adopt suitable national and international standards and codes to design, build, operate, inspect, and maintain electrical/electronic/digital equipment, systems and services.

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

Course (LOs)	program competencies

CR(1.1)	Apply acknowledge in a systematic manner suitable for analysis and design and further analyze the electric circuit using network theorems.	CR1	Select, model and analyze electrical power systems applicable to the specific discipline by applying the concepts of: generation, transmission and distribution of electrical power systems.
CR(2.1)	Use laboratory to identify the different types of semiconductor devices and their characteristics.	CR 2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR(2.2, 3.1)	Apply acknowledge to deal with transistors, transistor-based amplifiers, and its biasing.	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
		CR 3	Design and implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.
CR(2.3,3.2)	Apply acknowledge to deal with the concepts of feedback and oscillations and construct feedback amplifiers	CR 2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
		CR 3	Design and implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.
CR(3.3, 5.1)	Communicate effectively with the analogue electronics design integrally to	CR 3	Design and implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.

	solve engineering problems	CR 5	Adopt suitable national and international standards and codes to design, build, operate, inspect, and maintain electrical/electronic/digital equipment, systems, and services.

7- 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	CR(1.1)
2	Verification of KVL and KCL	0	0	2	CR(1.1)
3	Verification of Superposition theorem.	0	0	2	CR(1.1)
4	Verification of Thevenin's, Norton's Theorem.	0	0	2	CR(2.1)
5	To plot the IV-characteristics of an ordinary and Zener diode and LED.	0	0	2	CR(2.2
6	Study of Half wave and Full Wave Rectifiers.	0	0	2	CR(2.2
7	Study of Fixed Bias, Voltage divider bias Feedback configuration for transistors.	0	0	2	CR(2.3,3.2)
8	Midterm		1.0		
9	Input and output amplifiers& quiz	0	0	2	CR(3.3, 5.1)
10	Multistage amplifiers.	0	0	2	CR(3.3, 5.1)
11	Coupling between stage.	0	0	2	CR(3.3, 5.1)
12	Properties of OP-AMPS.	0	0	2	CR(3.3, 5.1)
13	Study of transistor amplifier circuit.	0	0	2	CR(3.3, 5.1)
14	Final Exam		2.0		
Total hours		0	0	28	--

8- 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
CR(1.1)	✓	✓	✓			✓	✓			✓	✓	✓	
CR(2.1)	✓	✓	✓			✓	✓			✓	✓	✓	
CR(2.2, 3.1)	✓	✓	✓			✓	✓			✓	✓	✓	
CR(2.3,3.2)	✓	✓	✓			✓	✓			✓	✓	✓	
CR(3.3, 5.1)	✓	✓	✓			✓	✓			✓	✓	✓	

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.

9- 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
CR(1.1)		✓	✓	✓	✓	✓	✓	✓		✓	
CR(2.1)		✓	✓	✓	✓	✓	✓	✓		✓	
CR(2.2, 3.1)		✓	✓	✓	✓	✓	✓	✓		✓	
CR(2.3,3 .2)		✓	✓	✓	✓	✓	✓	✓		✓	
CR(3.3, 5.1)		✓	✓	✓	✓	✓	✓	✓		✓	

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:	2022/2023

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	2022-2023

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- program objectives served by the course:

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

OP 5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies.
OP 6	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.
OP 7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
OP 12	Prepare engineers who can work on electrical power systems, including designing and realizing such systems.

2- The relation between the course objectives and the program objectives

	Course objectives		program objectives
oc 1	Recognize how determine length, area, and volume in three dimensional (3D) orthogonal coordinate system (rectangular, cylindrical, and spherical coordinates).	OP 5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies.
oc 2	Recognize how formulate vector representation of an electric field or electric flux density given a known charge distribution or a potential field.	OP 5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies.
oc 3	Recognize and develop relationship between electric field, potential, and energy density (potential energy stored) in the electrostatic field.	OP 5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies.

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. find the capacitance and stored energy with one dimensional potential variation using direct integration (Laplace's equation).	OP 6 OP 7	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems. Teach students to use experimental and data analysis techniques for electrical power engineering applications
oc 5	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	OP 6 OP 7	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems. Teach students to use experimental and data analysis techniques for electrical power engineering applications
oc 6	Recognize how determine length, area, and volume in three dimensional (3D) orthogonal coordinate system (rectangular, cylindrical, and spherical coordinates). Recognize how formulate vector representation of an electric field or electric flux density given a known charge distribution or a potential field. Recognize and develop relationship between electric field, potential, and energy density (potential energy stored) in the electrostatic field.	OP 6 OP 7 OP 12	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems. Teach students to use experimental and data analysis techniques for electrical power engineering applications Prepare engineers who can work on electrical power systems, including designing and realizing such systems.

oc 7	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.	OP 6	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.
		OP 7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
		OP 12	Prepare engineers who can work on electrical power systems, including designing and realizing such systems.

3- Learning outcomes of the course (LOs)

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

CR(2.1)	Determine length, area, and volume in three dimensional (3D) orthogonal coordinate system(rectangular, cylindrical, and spherical coordinates).
CR(2.2)	Produce the vector representation of an electric field or electric flux density given a known charge distribution or a potential field.
CR(2.3)	Conduct and Develop relationship between electric field, potential, and energy density (potential energy stored) in the electrostatic field.
CR(2.4)	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.
CR(2.5,3.1)	Solve the capacitance and stored energy with one dimensional potential variation using direct integration (Laplace's equation).
CR(2.6,3.2)	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.
CR(2.7,3.3)	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:

CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR3	Design and implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.

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

Course (LOs)		program competencies	
CR(2.1)	Determine length, area, and volume in three dimensional (3D) orthogonal coordinate system(rectangular, cylindrical, and spherical coordinates).	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR(2.2)	Produce the vector representation of an electric field or electric flux density given a known charge distribution or a potential field.	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR(2.3)	Conduct and Develop relationship between electric field, potential, and energy density (potential energy stored) in the electrostatic field.	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR(2.4)	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.	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR(2.5,3.1)	Solve the capacitance and stored energy with one dimensional potential variation	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design

	using direct integration (Laplace's equation).	CR3	Design and implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.
CR(2.6,3.2)	Produce the relate static electric or magnetic field in the presence of dielectric or magnetic materials.	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
	Identify them across the boundaries of various insulating or magnetic materials.	CR3	Design and implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.
CR(2.7,3.3)	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.	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
		CR3	Design and implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.

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 Review of vector algebra, Coordinate systems and transformation, vector calculus, Divergence and Stokes' theorems, and the Laplace operator.	2	0	2	CR(2.1)
2	Focuses on Coulomb's law and Electrostatic fields for discrete and continuous charges in vacuum.	2	0	2	CR(2.1)
3	Electric flux density, gauss's law, applications of gauss's law, electric scalar potential.	2	0	2	CR(2.1)
4	relationship between electrostatic fields and the scalar potential, and work done.	2	0	2	CR(2.2)
5	Electric dipole, energy and energy density, fundamental postulates of electrostatic field.	2	0	2	CR(2.3)
6	boundary conditions of static electric field in conductor Poisson's and Laplace's equations.	2	0	2	CR(2.3)
7	Discrete memoryless channel.	2	0	2	CR(2.3)

8	Midterm		1.0		
9	Dielectrics and polarization, boundary conditions and capacitance, Conductors, Current density, and Resistance.	2	0	2	CR(2.4)
10	Image method and Boundary value problems (Poisson's and Laplace's equations in different coordinate systems).	2	0	2	CR(2.4)
11	Magnetostatic fields Biot savart and Ampere's law.	2	0	2	CR(2.5,3.1)
12	magnetic flux density, magnetic scalar and vector potentials.	2	0	2	CR(2.5,3.1)
13	Comparison between Magnetostatic and Electrostatic fields	2	0	2	CR(2.6,3.2)
14	Magnetic force, magnetic dipole, magnetic materials, magnetic energy, boundary conditions, and Magnetic circuits .	2	0	2	CR(2.6,3.2)
15	Maxwell's equation for time varying fields, Faraday's law.	2	0	2	CR(2.7,3.3)
16	Final Exam		2.0		
Total hours		28	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/ sketches	projects	Problem solving	Brain storming	Practical: lab	Discovering / self learning	Site visit	Reports/ researches	Cooperative work	presentation	Discussion	modelling
CR(2.1)	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	
CR(2.2)	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	
CR(2.3)	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	
CR(2.4)	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	
CR(2.5,3.1)	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	
CR(2.6,3.2)	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	
CR(2.7,3.3)	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	

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
CR(2.1)	✓	✓	✓	✓	✓	✓	✓	✓		✓	
CR(2.2)	✓	✓	✓	✓	✓	✓	✓	✓		✓	
CR(2.3)	✓	✓	✓	✓	✓	✓	✓	✓		✓	
CR(2.4)	✓	✓	✓	✓	✓	✓	✓	✓		✓	
CR(2.5,3.1)	✓	✓	✓	✓	✓	✓	✓	✓		✓	
CR(2.6,3.2)	✓	✓	✓	✓	✓	✓	✓	✓		✓	
CR(2.7,3.3)	✓	✓	✓	✓	✓	✓	✓	✓		✓	

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	
	Quiz (2)	(5) marks	
Discussions	30%		
Sheets and Sketches	40%	5 marks	(40) marks
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.

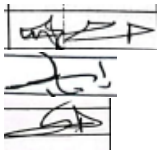
11- Facilities required for teaching and learning:

- 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:	2022/2023



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

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	2022-2023

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.

Professional information

1- 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

2- program objectives served by the course:

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

OP 5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies.
OP 6	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.
OP 12	Prepare engineers who can work on electrical power systems, including designing and realizing such systems.

3- The relation between the course objectives and the program objectives

	Course objectives	program objectives	
oc 1	Recognize the basic science and basic mathematics and be able to use these tools in their own engineering field.	OP 5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies.
oc 2	Produce the necessary techniques, hardware, and communication tools for modern engineering applications 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.	OP 5 OP 6	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies. Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.
oc 3	Recognize the fields of integrated electronic circuits, electronic data storage, high-speed computing,	OP 5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies.

	communications, signal processing, microwave, wave propagation and antenna, optoelectronics, automation, automatic control, and monitoring systems, circuit analysis, network analysis, digital signal processing, and microprocessors 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.	OP 6	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.
oc 4	recognize the solid core of foundation courses in physics, mathematics, computer science, and general engineering, which is also essential for lifelong learning.	OP 5 OP 6	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies. Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.
oc 5	Recognize the basic science and basic mathematics and be able to use these tools in their own engineering field.	OP 12	Prepare engineers who can work on electrical power systems, including designing and realizing such systems.
oc 6	Produce the necessary techniques, hardware, and communication tools for modern engineering applications 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.	OP 5 OP 6	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies. Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.

oc 7	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	OP 5	Prepare students for engineering analyses and problem-solving using appropriate mathematical and computational methodologies.
		OP 6	Prepare undergraduate students who can create new ways to meet society's needs by applying fundamentals of engineering sciences to practical problems using design and syntheses of electrical components, circuits, and systems.

4- Learning outcomes of the course (LOs)

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

CR(2.1)	Recognize the signals fundamental & linear time invariant systems used in communication systems.
CR(2.2)	Recognize the basic concepts of sampling theory
CR(2.3,3.1)	Recognize the probability, random variables & random processes
CR(2.4)	Identify different types of analog communication system and different modulation techniques used in these systems
CR(2.5)	Apply acknowledge to analyze the properties of Fourier series for continuous time signals
CR(2.6)	Apply acknowledge to analyze of noise and its impact on different modulation techniques.
CR(2.7,3.2)	Express all of the preceding basic concepts to practical issues

5- Program competencies served by the course:

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

CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR3	Design and implement elements, modules, sub-systems or systems in electrical/electronic/digital engineering using technological and professional tools.

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

Course (LOs)		program competencies	
CR(2.1)	Recognize the signals fundamental & linear time invariant systems used in communication systems.	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design

CR(2.2)	Recognize the basic concepts of sampling theory	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR(2.3,3.1)	Recognize the probability, random variables & random processes	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
		CR3	Design and implement elements, modules, sub-systems or systems in electrical/electronic/digital engineering using technological and professional tools.
CR(2.4)	Identify different types of analog communication system and different modulation techniques used in these systems	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR(2.5)	Apply acknowledge to analyze the properties of Fourier series for continuous time signals	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR(2.6)	Apply acknowledge to analyze of noise and its impact on different modulation techniques.	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR(2.7,3.2)	Express all of the preceding basic concepts to practical issues	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
		CR3	Design and implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.

7- 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	CR(2.1)
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	CR(2.2)
3	Probability, Random Variables & their moments, their significance, Gaussian & Rayleigh Probability density functions	2	2	0	CR(2.3,3.1)
4	Amplitude Modulation: Need of Modulation, Block schematic of a typical communication system	2	2	0	CR(2.4)
5	AM modulation system, Modulation index, Generation (Squire Law & Switching Modulator)	2	2	0	CR(2.3,3.1)
6	AM Detection (Envelope & Squire Law Detector) of AM wave , Side bands & Power contents in AM Wave,	2	2	0	CR(2.4)
7	AM transmitter block diagram, TRF receiver & its limitations, Necessity of heterodyning, Super heterodyne radio receivers, IF amplifiers & selection of IF				CR(2.5)
8	Midterm	1.0			
9	DSB-SC (Balanced, Ring Modulator & Synchronous Detector), SSB-SC, Methods of generation & detection,	2	2	0	CR(2.4)
10	VSB modulation, Comparison of various AM systems, Frequency division multiplexing, Group delay & phase delay.	2	2	0	CR(2.5)
11	Revision	2	2	0	CR(2.2)
12	Frequency Modulation: Relationships between Phase & Frequency Modulation, Narrowband FM, Wideband FM & their Spectrum, Transmission bandwidth of FM And PM signals.	2	2	0	CR(2.6)
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	CR(2.7,3.2)
14	Revision 1	2	2	0	CR(2.4)
15	Revision 2	2	2	0	CR(2.4)
16	Final Exam	2.0			
Total hours		28	28	0	--

8- 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	Site visit	Reports/ researches	Cooperative work	presentation	Discussion	modelling
CR(2.1)	✓												
CR(2.2)	✓	✓											
CR(2.3,3.1)	✓	✓	✓	✓	✓		✓		✓	✓			✓
CR(2.4)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓
CR(2.5)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓
CR(2.6)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓
CR(2.7,3.2)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓

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.

9- 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
CR(2.1)											
CR(2.2)											
CR(2.3,3.1)	✓	✓	✓	✓	✓		✓		✓		✓
CR(2.4)	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
CR(2.5)	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
CR(2.6)	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
CR(2.7,3.2)	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓

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:

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:	2022/2023

Course specification

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	2022-2023

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

1- program objectives served by the course:

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

OP 7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
OP 9	Provide students with an awareness of the tools and skills necessary for participating effectively in building a robust national economy and meeting current and future modern industry needs.

2- The relation between the course objectives and the program objectives

Course objectives		program objectives	
oc 1	Produce the necessary techniques, hardware, and communication tools for modern engineering applications	OP 7	Teach students to use experimental and data analysis techniques for electrical power 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.	OP 7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
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	OP 7	Teach students to use experimental and data analysis techniques for electrical power engineering applications

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.	OP 7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
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	OP 7	Teach students to use experimental and data analysis techniques for electrical power engineering applications
		OP 9	Provide students with an awareness of the tools and skills necessary for participating effectively in building a robust national economy and meeting current and future modern industry needs.

3- Learning outcomes of the course (LOs)

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

CR(2.1)	Apply the Knowledge of probability, random variables & random processes.
CR(2.2)	An ability to apply knowledge of communication theory and equations practically
CR(2.3,3.1)	Ability to simulate communication experiment using Emona101.
CR(2.4)	Ability to simulate communication experiment using MATLAB simulation (Simulink & coding).
CR(2.5,3.2)	Ability to create the function in teams.
CR(2.6,3.3)	Communicate effectively for design the electronic component related to communication.

4- Program competencies served by the course:

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

CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR3	Design and implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.

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

Course (LOs)	program competencies

CR(2.1)	Apply the Knowledge of probability, random variables & random processes.	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR(2.2)	An ability to apply knowledge of communication theory and equations practically	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR(2.3,3.1)	Ability to simulate communication experiment using Emona101.	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
		CR3	Design and implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.
CR(2.4)	Ability to simulate communication experiment using MATLAB simulation (Simulink & coding).	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
CR(2.5,3.2)	Ability to function in teams.	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design
		CR3	Design and implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.
CR(2.6,3.3)	Communicate effectively for design the electronic component related to communication.	CR2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design

CR3	Design and implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.

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 to Signals, simulate different kind of signal (Analogue-Digital)	0	0	2	CR(2.1)
2	Apply different simple process (multiplication-addition-subtraction-convolution) using kit and MATLAB	0	0	2	CR(2.2)
3	Apply the Probability of Random Variables(using AWGN) & their moments, their significance, Gaussian & Rayleigh Probability density functions	0	0	2	CR(2.3,3.1)
4	Simulate Amplitude Modulation: Need of Modulation, Block schematic of a typical communication system using Kit and MATAB	0	0	2	CR(2.4)
5	Simulate AM modulation system, Modulation index, Generation (Squire Law & Switching Modulator) using Kit and MATAB	0	0	2	CR(2.3,3.1)
6	Simulate AM Detection (Envelope & Squire Law Detector) of AM wave , Side bands & Power contents in AM Wave, using Kit and MATAB	0	0	2	CR(2.4)
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	CR(2.5,3.2)
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	CR(2.4)
10	Simulate SSB modulation, Comparison of various AM systems using Kit and MATAB.	0	0	2	CR(2.5,3.2)

11	Revision	0	0	2	CR(2.2)
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	CR(2.6,3.3)
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	CR(2.6,3.3)
14	Revision	0	0	2	CR(2.2)
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	CR(2.6,3.3)
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/ sketches	projects	Problem solving	Brain storming	Practical: lab	discovering	Site visit	Reports/ researches	Cooperative work	presentation	Discussion	modelling
CR(2.1)	✓	✓	✓			✓	✓			✓	✓	✓	
CR(2.2)	✓	✓	✓			✓	✓			✓	✓	✓	
CR(2.3,3.1)	✓	✓	✓			✓	✓			✓	✓	✓	
CR(2.4)	✓	✓	✓			✓	✓			✓	✓	✓	
CR(2.5,3.2)	✓	✓	✓			✓	✓			✓	✓	✓	
CR(2.6,3.3)	✓	✓	✓			✓	✓			✓	✓	✓	

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
CR(2.1)		✓	✓	✓	✓	✓	✓	✓		✓	
CR(2.2)		✓	✓	✓	✓	✓	✓	✓		✓	
CR(2.3,3.1)		✓	✓	✓	✓	✓	✓	✓		✓	
CR(2.4)		✓	✓	✓	✓	✓	✓	✓		✓	
CR(2.5,3.2)		✓	✓	✓	✓	✓	✓	✓		✓	
CR(2.6,3.3)		✓	✓	✓	✓	✓	✓	✓		✓	

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

Quizes	Quiz (1) Quiz (2)	(0) marks (0) marks	
Discussions	20%		(60) marks
Sheets and Sketches	70%	40 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

Fundamental of Communication

b) Required books

- Emona 101 lab manual

c) Recommend books d) Periodicals, Web sites, etc	▪ Fundamentals of Signals and Systems Using the Web and MATLAB Edward W. Kamen Bonnie S Heck Third Edition ▪ Mentioned at time. ▪ 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:	2022/2023

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	2022-2023

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- program objectives served by the course:

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

OP 1	Understand the concept of Covers systems of linear equation.
OP 2	Understand the concept of Algebra of matrices.
OP 3	Understand the concept of Linear transformations.
OP 4	Understand the concept of Determinants.
OP 5	Solve vector spaces problems.
OP 6	Solve and practice on inner product spaces problems.
OP 7	Understand the concept of Eigenvalues and eigenvectors.

4- The relation between the course objectives and the program objectives

	Course objectives		program objectives
oc 1	Recognize the concepts of systems of linear equation	OP 1	Understand the concept of Covers systems of linear equation.
oc 2	explain the concepts of mathematical of algebra of matrices	OP 2	Understand the concept of Algebra of matrices.
oc 3	apply knowledge of mathematics to linear transformations	OP 3	Understand the concept of Linear transformations.
oc 4	explain the concepts of determinants	OP 4	Understand the concept of Determinants.
oc 5	Identify and analyze data, to Deal with design situations within solving design problems based on the analytical process for vector spaces.	OP 5	Solve vector spaces problems.
oc 6	Recognize the methodologies of solving engineering problems with inner product spaces	OP 6	Solve and practice on inner product spaces problems.
oc 7	apply knowledge of theory of equations, eigenvalues, and eigenvectors to solve engineering problems.	OP 7	Understand the concept of Eigenvalues and eigenvectors.

5- Learning outcomes of the course (LOs)

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

C(1.1)	Explain concepts and theories of mathematics and sciences, appropriate to Linear Algebra and Matrices.
C(1.2,2.1)	Demonstrate methodologies of solving engineering problems, data collection and interpretation.
C(2.2)	Select appropriate solutions for engineering problems based on analytical thinking.
C(2.3)	Apply knowledge of mathematics to solve engineering problems.
C(1.3)	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.
C(1.4,2.4)	Produce and prepare the manages tasks, time, and resources, when solving mathematics problems, and in exams.
C(1.5)	Communicate effectively by applying the knowledge of mathematics to solve differential problems.

6- Program competencies served by the course:

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

C1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.
C2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions

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

Course (LOs)		program competencies	
C(1.1)	Explain concepts and theories of mathematics and sciences, appropriate to Linear Algebra and Matrices.	C1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.
C(1.2,2.1)	Demonstrate methodologies of solving engineering problems, data collection and interpretation.	C1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.
		C2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions

C(2.2)	Select appropriate solutions for engineering problems based on analytical thinking.	C2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions
C(2.3)	Apply knowledge of mathematics to solve engineering problems.	C2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions
C(1.3)	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.	C1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.
C(1.4,2.4)	Produce and prepare the manages tasks, time, and resources, when solving mathematics problems, and in exams.	C1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.
		C2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions
C(1.5)	Produce and prepare the manages tasks, time, and resources, when solving mathematics problems, and in exams.	C1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.

7- 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	C(1.1, 1.2,2.1)
2	Covers systems of linear equation	2	2	0	C(1.1, 2.2)
3	algebra of matrices	2	2	0	C(1.2,2.1, 1.3, 1.4,2.4)
4	linear transformations	2	2	0	C(1.2,2.1, 2.3)
5	determinants	2	2	0	C(1.2,2.1, 2.3)
6	vector spaces	2	2	0	C(1.2,2.1, 2.3)
7	inner product spaces				C(2.3)
8	Midterm		1.0		
9	eigenvalues and eigenvectors	2	2	0	C(1.2,2.1, 2.3)
10	diagonalization	2	2	0	C(1.2,2.1, 2.3)
11	orthogonally	2	2	0	C(1.2,2.1,1.3)
12	special matrices and applications	2	2	0	C(1.2,2.1, 2.3)
13	The use of computer software such as MathCAD	2	2	0	C(1.2,2.1, 2.3)
14	MATLAB	2	2	0	C(1.2,2.1, 2.3)
15	Revision				C(1.2,2.1, 2.3, 1.3)
16	Final Exam		2.0		
Total hours		28	28	0	--

8- 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
C(1.1)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	
C(1.2,2.1)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	
C(2.2)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	
C(2.3)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	
C(1.3)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	
C(1.4,2.4)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	
C(1.5)	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	

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.

9- 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
C(1.1)	✓	✓	✓	✓				✓	✓	✓	
C(1.2,2.1)	✓	✓	✓	✓				✓	✓	✓	
C(2.2)	✓	✓	✓	✓				✓	✓	✓	
C(2.3)	✓	✓	✓	✓				✓	✓	✓	
C(1.3)	✓	✓	✓	✓				✓	✓	✓	
C(1.4,2.4)	✓	✓	✓	✓				✓	✓	✓	
C(1.5)	✓	✓	✓	✓				✓	✓	✓	

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)	(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

- 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
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Date:	2022/2023