Course Specification

Course Code: CVE 1111 **Course Title: Civil Engineering**

1. Basic information

Program Title	Electronics and Communication Engineering Depart.			
Department offering the program	Electronics and Communication Engineering Depart.			
Department offering the course	Civil Engineering Department			
Course Code	CVE 1111			
Year/level	First year / Second level (1nst Semester)			
Specialization	**Minor**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	2	0	5

2. Course Aims

No.	Aim
1	Make it possible for graduates to pursue continuing education in highway engineering and self-learning. (AM2)
2	Work with contemporary field instruments, design and perform experiments, asnd analyze and interpret results. (AM4).

3. Learning Outcomes (LOs)

CLO3	Develop and conduct appropriate experimentation and/or simulation to draw conclusions.
CLO12	Practice research techniques and methods of investigation as an inherent part of learning.
CLO15	Function efficiently as an individual and as a member of multi-disciplinary and multi- cultural teams.

4. Course Contents

Topics	Week
Introduction to an indeterminate structures	1
Stability and Reactions of Structures.	2
Reactions	3
Internal Forces of Beams.	4
Internal Forces of Frames.	5
Internal Forces of Trusses.	6
Introduction of surveying	7
Linear measuring and Travers	8
Different kinds of scales	10
Bearing and Angles computations	11
Example on the leveling	12
Theodolite	13
Practical exam	14
Final exam	15

5. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods										
	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation

CLO3	√			√								
CLO12	√			√		√						
CLO15	√			√		√						

6. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Attendance	CLO15
2	Sheets	CLO15
3	Quizzes	CLO3, 12
4	Mid-term Exam	CLO3, 12
5	Practical Exam	-
6	Final Exam	CLO31, 12, 15

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Sheets	Bi-weekly
3	Quizzes	4 & 10
4	Mid-term Exam	9
5	Practical Exam	14
6	Final Exam	15

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	sheets	40%	40	5%	5%
	Attendance			5%	5%
	Quizzes				
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance				
	Lab. Reports				
	Lab. Activities / Projects				
	practical exam				
Final Exam		60%	60		
Total		100%	100		

8. List of References

[1] Farkas, József, and Károly Jármai. Analysis and optimum design of metal structures. CRC Press, 2020.

[2] Megson, Thomas Henry Gordon. Structural and stress analysis. Butterworth-Heinemann, 2019.

[3] Kassimali, Aslam. Structural analysis. Cengage Learning, 2018.

[4] Theory of Structures-Part 1-EL-Dakhakhni.

[5] www.Arabian-eng.com.

[6] Structural Analysis –R.C. Hibbeler.

[7] Plane Surveying prof. Abd-elhameed Abo- Mariam.

9. Facilities required for teaching and learning

Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Moodle and Microsoft teams
Data show

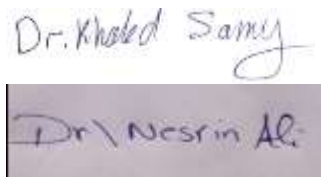
Laboratory Usage

10. Matrix of Course Content with Course LO's

No.	Topics	Aim	Los
1	Introduction to an indeterminate structures	1	CLO3
2	Stability and Reactions of Structures.	1	CLO3, CLO12
3	Reactions	1	CLO3, CLO12
4	Internal Forces of Beams.	1	CLO3, CLO12
5	Internal Forces of Frames.	1	CLO3, CLO12
6	Internal Forces of Trusses.	1	CLO3, CLO12
8	Introduction of surveying	1	CLO3
9	Mid-term exam	1	CLO3, CLO12, CLO15
10	Different kinds of scales	1	CLO3, CLO12, CLO15
11	Bearing and Angles computations	1,2	CLO3, CLO12
12	Example on the leveling	1,2	CLO3, CLO12, CLO15
13	Theodolite	1,2	CLO3, CLO12
14	Practical exam	….	……..
15	Final exam	1,2	CLO3, CLO12, CLO15

11. Matrix of Program LOs with Course Los

Program Los		Course Los	
PLO2	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.	CLO3	Develop and conduct appropriate experimentation and/or simulation to draw conclusions.
PLO5	Practice research techniques and investigative methods as an inherent part of learning.	CLO12	Practice research techniques and methods of investigation as an inherent part of learning.
PLO7	Function efficiently as an individual and as a member of multi - disciplinary and multi-cultural teams.	CLO15	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.

Title	Name	Signature
Course coordinator	**Dr. Khale d Samy Aballah** **Dr. Nesrin Ali Morsy**	
Program Coordinator:	**Assoc.Prof. Dr. Osama ELghandour**	
Head of Department	**Assoc.Prof. Dr. Osama ELghandour**	
Date of Approval	**2022\9\3**	

Course Specification

Course Code: EPE1111 **Course Title: Electric Circuits (1)**

1. Basic information

Program Title	Electronic and Communication Eng. Department			
Department offering the program	Electronic and Communication Eng. Department			
Department offering the course	Electrical Power Engineering Depart.			
Course Code	EPE1111			
Prerequisties	----------			
Year/level	First year / First Semester (2nd Level)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	2	0	5

2. Course Aims

No.	Aim
1	Enrich the student knowledge about dc and ac circuits' theories to develop the student ability to analyze and solve dc and ac circuits. (AM1)

3. Learning Outcomes (LOs)

CLO15	Aquire the concepts of electrical DC and AC circuit analysis.
CLO16	Apply the methodologies of DC theories solution.
CLO17	Select the main principles and methodologies of AC circuits.
CLO19	Analyze AC theories using different methods of solutions.

4. Course Contents

Topics	Week
Introduction to DC Circuit Analysis	1
Components of Electrical Circuits	2
Basic Concepts of DC Circuits	3
Nodal Analysis	4
Mesh Theory	5
Source Transformation Theory	6
Super Position Theory	7
Thevenin's theory	8
Mid Term Exam	9
Norton's Theory.	10
Calculation of maximum power using Thevenin's and Norton's Theories.	11
Introduction and Basic concepts to AC Circuit analysis	12
Nodal Analysis in AC Circuits	13
Mesh Analysis in AC Circuits	14
Examples on different AC circuits	15

5. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO15	√	√			√						√	
CLO16	√	√				√	√					√
CLO17	√	√					√				√	√
CLO19	√	√			√	√						

6. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	√
2	Online lectures and assignments	√

7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	-------
2	Reports	CLO16, CLO17.
3	Sheets	CLO15, CLO16, CLO17, CLO19.
4	Quizzes	CLO16, CLO17.
5	Mid-term Exam	CLO15, CLO16.
6	Final Exam	CLO15, CLO16, CLO17, CLO19.

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports	Bi-weekly
3	Sheets	Weekly
4	Quizzes	Bi-weekly
5	Mid-term Exam	9
6	Final Exam	16

7.3 weighting of Assessment

	Assessment Method	Weights %	Weights
Teacher Opinion	Reports / sheets / Activities	5%	5
	Attendance	5%	5
	Quizzes	10%	10
	Mid-term exam	20%	20
Final Exam		60%	60
Total		100%	100

8. List of References

[1] JHON O'MALLY, Basic Circuit Analysis Theory and Problems, second edition, 1992.
[2] J. David Irwin & R. Mark Nelms, "Basic engineering Circuit Analysis", 10th Edition, John Wiley & Sons, 2011.
[3] James W. Nilsson, "Electric Circuits", 8th Edition, Pearso prentice Hall, 2008..

9. Facilities required for teaching and learning

Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Data show

10. Matrix of Course Content with Course LO's

Week No.	Topics	Aim	LO's
1	Introduction to DC Circuit Analysis	1	CLO15.
2	Components of Electrical Circuits	1	CLO15.
3	Basic Concepts of DC Circuits	1	CLO15.
4	Nodal Analysis	1	CLO16.
5	Mesh Theory	1	CLO16.
6	Source Transformation Theory	1	CLO16.
7	Super Position Theory	1	CLO16.
8	Thevenin's theory	1	CLO16.
10	Norton's Theory.	1	CLO16.
11	Calculation of maximum power using Thevenin's and Norton's Theories.	1	CLO16.
12	Introduction and Basic concepts to AC Circuit analysis	1	CLO17.
13	Nodal Analysis in AC Circuits	1	CLO19.
14	Mesh Analysis in AC Circuits	1	CLO19.
15	Examples on different AC circuits	1	CLO17, CLO19.

11. Matrix of Program LOs with Course LOs

Program LOs		Course LOs	
PL10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	CLO15	Aquire the concepts of electrical DC and AC circuit analysis.
		CLO16	Apply the methodologies DC theories and study the criterion of solution.
PL11	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.	CLO17	Select the main principles and methodologies of AC circuits.
		CLO19	Analyze AC theories using different methods of solutions.

Title	Name	Signature
Course coordinator	**Dr. Zeinab Gamal Hassan**	
Program coordinator	**Assoc.Prof. Dr. Osama ELghandour**	
Head of Department	**Assoc.Prof. Dr. Osama ELghandour**	
Date of Approval	**3/9/2022**	

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Course Specification

Course Code: MUM1102 **Course Title: Technical Writing**

1. Basic information

Program Title	Electronics and Communication Engineering Depart.			
Department offering the program	Electronics and Communication Engineering Depart.			
Department offering the course	Engineering Mathematics and Physics department			
Course Code	HUM1102			
Prerequisite	None			
Year/level	First Year / First Semester (First level)			
Specialization	**Minor**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	2	0	1	3

2. Course Aims

No.	Aim
1	Communicate in English fluently. Understand technical terms related to different engineering issues. Employ engineering terms and jargon language effectively. Write and express themselves in English effectively. (AM2)

3. Learning Outcomes (LOs)	
CLO 13	Communicate technical writing thoughts clearly and efficiently. Additionally, presentation and communication skills
CLO 14	Use skilled technical writing methodology with interest and clarity design, and correctly layout of written materials,

4. Course Contents

Topics	Week
Introduction	1
Engineering—what's it about?	2
Parts of speech	3
Word order and sentence structure	4
Engineering Materials	5
Present simple	6
Recycling	7
Present continuous	8
Mid Term Exam	9
Engineering Design	10
Technical problems	11
Writing and paragraph structure	12
Writing rules	13
Aircraft	14
Aircraft	15

5. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO 13	√	√			√	√	√	√			√	√
CLO 14	√	√			√	√	√	√			√	√

6. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	×
2	Online lectures and assignments	×

7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	-------
2	Reports	CLO 13 , CLO 14
3	Sheets	CLO 13 , CLO 14
4	Quizzes	CLO 13 , CLO 14
5	Mid-term Exam	CLO 13 , CLO 14
6	Final Exam	CLO 13 , CLO 14

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports	Bi-weekly
3	Sheets	Weekly
4	Quizzes	Bi-weekly

5	Mid-term Exam	9
6	Final Exam	16

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets / Activities	40 %	40	5%	5
	Attendance			5%	5
	Quizzes			10%	10
	Mid-term exam			20%	20
Final Exam		60 %			60
Total			100		100

8. List of References

1. Murphy R. (2019). English Grammar in Use. Cambridge Press.Electric Machinery Fundamentals.
2. Azar, B. (2011) Fundamentals of English grammar (4th edition). Longman. (Chapters 1-9 & 11)
3. http://www.azargrammar.com/
4. http://www.pearsonlongman.com/ae/azar/grammar_ex/index.html
https://www.englishgrammar.org/

9. Facilities required for teaching and learning

Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

10. Matrix of Course Content with Course LO's

Week No.	Topics	Aim	LO's
1	Introduction	1	CLO 13 , CLO 14
2	Engineering—what's it about?	1	CLO 13 , CLO 14
3	Parts of speech	1	CLO 13 , CLO 14
4	Word order and sentence structure	1	CLO 13 , CLO 14
5	Engineering Materials	1	CLO 13 , CLO 14
6	Present simple	1	CLO 13 , CLO 14
7	Recycling	1	CLO 13 , CLO 14
8	Present continuous	1	CLO 13 , CLO 14
10	Engineering Design	1	CLO 13 , CLO 14
11	Technical problems	1	CLO 13 , CLO 14
12	Writing and paragraph structure	1	CLO 13 , CLO 14
13	Writing rules	1	CLO 13 , CLO 14
14	Aircraft	1	CLO 13 , CLO 14
15	Aircraft	1	CLO 13 , CLO 14

11. Matrix of Program LOs with Course LOs

Program LOs		Course LOs	
PL8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	CLO 13	Communicate technical writing thoughts clearly and efficiently. Additionally, presentation and communication skills
PL9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	CLO 14	Use skilled technical writing methodology with interest and clarity design, and correctly layout of written materials,

Title	Name	Signature
Course coordinator	**Dr. Nagwa Hussien**	
Program coordinator	**Ass.Prof. Dr. Osama Elgandour**	

Head of Department	**Ass.Prof. Dr. Osama Elgandour**	
Date of Approval	**3/9/2022**	

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Course Specification

Course Code: PHM1111 **Course Title: Mathematics (3)**

1. Basic information

Program Title	Electronic and Communication Eng. Department			
Department offering the program	Electronic and Communication Eng. Department			
Department offering the course	Physics and Mathematical Engineering			
Course Code	PHM1111			
prerequisite	Mathematics (1&2)			
Year/level	First year / First Semester (second Level)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	4	2	0	6

2. Course Aims

No.	Aim
1	Apply the essential knowledge to understand of some basic of calculus: Multiple Integrals, The normal and tangent plane, Surface Integration, Differential equations of the first order, Partial derivatives applications, Maxima of Multivariate functions, Higher order differential equations: (homogeneous and non-homogeneous),Simultaneous and expansion functions.(AM1)

3. Learning Outcomes (LOs)

CLO1	Identify the different classifications of equations, Partial Differentiation and the difference between the double Integral and the triple Integral and the Nonhomogeneous equations, the Method of Undetermined coefficients and the Variation of parameters and Expansion function.
CLO3	Solve complex engineering problems by applying the different methods to solve the second order differential equations and determine the particular solutions, multiple integrals in any other area, Partial Differentiation and Expansion function.
CLO17	Select different methods to evaluate multiple integrals
CLO19	Analyze the different kinds of differential equations of the first order (or second order), operator method and variation of parameters to find the general solution for the second order differential equations.

4- Course Contents	
Topics	**Week**
Partial Derivatives-Ordinary Differential Equations (separable method- Homogenous Eqs)	1
Partial Derivatives – O.D.E (Exact and Integrating method)	2
Applications of Partial Derivatives - First order Differential Equations	3
Applications of Partial Derivatives - Ordinary Differential Equations of n^{th} order.	4
Applications of Partial Derivatives - Ordinary Differential Equations of n^{th} order.	5
Double integral – Orthogonal Eqs.	6
Double integral - Linear Differential Equations with constant coefficients.	7
Double integral - Linear Differential Equations with constant coefficients	8
Mid Term Exam	9
Double integral - Linear Differential Equations with constant coefficients	10
Triple Integral - Linear Differential Equations with constant coefficients	11
Triple Integral - Linear Differential Equations with constant coefficients	12
Surface integral (Line integral) - Linear Differential Equations with constant coefficients	13
Surface integral (Green's theorem) - Linear Differential Equations with Variable coefficients (Euler).	14
Functions Expansion - Simultaneous Differential Equations.	15

5-Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO1	√	√			√		√	√				
CLO3	√	√			√	√	√	√				√
CLO17	√	√			√	√	√	√				√
CLO19	√	√			√	√	√	√				√

4. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	×
2	Online lectures and assignments	×

5. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Attendance	-------
2	Reports	CLO3,CLO17,CLO19
3	Sheets	CLO1,CLO3,CLO17,CLO19
4	Quizzes	CLO3,CLO17
5	Mid-term Exam	CLO3,CLO17
6	Final Exam	CLO1,CLO3,CLO17,CLO19

7.2 Assessment Schedule		
No.	**Assessment Method**	**Weeks**
1	Attendance	weekly
2	Reports	Bi-weekly
3	Sheets	weekly
4	Quizzes	Bi-weekly
5	Mid-term Exam	9
6	Final Exam	16

7.3 Assessment Schedule			
	Assessment Method	**Weights%**	**Weights**
Teacher Opinion	Reports / sheets	10%	15
	Attendance	3.33	5
	Quizzes	10%	15
	Mid-term exam	26.6%	40
Final Exam		50%	75
Total		100%	150

6. List of References

[1] Sheply L. Ross, John Wiley and Sons, "Differential equations 3rd Edition", copy right 1984, by john Wiley & Sons, Inc., published simultaneously in Canada 2017.
[2] Dennis G. Zill and Michael R. Cullen, "Differential Equations with Boundary Problem", seven edition, PWS Publishers; published simultaneously in Canada 2015.
[3] William E. Boyce, Richard:" Elementary Differential Equations and Boundary Value Problems", 8th Edition Wiley, Publisher John Wiley & Sons, Inc., 2014.
[4] James.S,Daniel.K. "Calculus".Cengage learning,9th Edition ,2020.

7. Facilities required for teaching and learning

Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

8. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	Partial Derivatives-Ordinary Differential Equations (separable method- Homogenous Eqs)	1	CLO1
2	Partial Derivatives – O.D.E (Exact and Integrating method)	1	CLO3,CLO19
3	Applications of Partial Derivatives - First order Differential Equations	1	CLO3,CLO19
4	Applications of Partial Derivatives - Ordinary Differential Equations of n^{th} order.	1	CLO3,CLO19
5	Applications of Partial Derivatives - Ordinary Differential Equations of n^{th} order.	1	CLO3,CLO19
6	Double integral – Orthogonal Eqs.	1	CLO1, CLO3,CLO17,CLO19
7	Double integral - Linear Differential Equations with constant coefficients.	1	CLO3,CLO17,CLO19
8	Double integral - Linear Differential Equations with constant coefficients	1	CLO3,CLO17,CLO19
10	Double integral - Linear Differential Equations with constant coefficients	1	CLO3,CLO17,CLO19
11	Triple Integral - Linear Differential Equations with constant coefficients	1	CLO3,CLO17,CLO19
12	Triple Integral - Linear Differential Equations with constant coefficients	1	CLO3,CLO17,CLO19
13	Surface integral (Line integral) - Linear Differential Equations with constant coefficients	1	CLO3,CLO17,CLO19
14	Surface integral (Green's theorem) - Linear Differential Equations with Variable coefficients (Euler).	1	CLO3,CLO17,CLO19
15	Functions Expansion - Simultaneous Differential Equations.	1	CLO1, CLO3, CLO19

9. Matrix of Program LOs with Course Los

Program LOs		Course Los	
PL1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO1	Identify the different classifications of equations, Partial Differentiation and the difference between the double Integral and the triple Integral and the Nonhomogeneous equations, the Method of Undetermined coefficients and the Variation of parameters and Expansion function.
		CLO3	Solve complex engineering problems by applying the different methods to solve the second order differential equations and determine the particular solutions, multiple integrals in any other area, Partial Differentiation and Expansion function.
PL11	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	CLO17	Select different methods to evaluate multiple integrals
		CLO19	Analyze the different kinds of differential equations of the first order (or second order), operator method and variation of parameters to find the general solution for the second order differential equations.

Title	Name	Signature
Course coordinator	**Dr. Eman Abdelaziz**	
Program coordinator	Ass.Prof.Dr Osama Elghandour	
Head of Department	Ass.Prof.Dr Osama Elghandour	
Date of Approval	**3/9/2022**	

برنامج هندسة الالكترونيات والاتصالات
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بالتجمع الخامس

Course Specification

Course Code: PHM1112 **Course Title: Physics (3)**

1. Basic information

Program Title	Electronic and Communication Eng. Department			
Department offering the program	Electronic and Communication Eng. Department			
Department offering the course	Engineering Mathematics and Physics department			
Course Code	EPE1112			
Prerequisites	Physic1&2			
Year/level	First Year / First Semester (First level)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	4	1	1	6

2. Course Aims

No.	Aim
1	Acquire the student with the essential knowledge to basics of electrical physics including Electron in a matter, free electron theory, Energy distribution functions, Semiconductors, Superconductors and Nanotechnology. (AM1)

3. Learning Outcomes (LOs)	
CLO4	Develop basics appropriate to modern physics, quantum physics and their application in electrical physics.
CLO5	Conduct appropriate experimentation to study Optical, modern physics.
CLO22	Analyze method by applying the technology to solve technical problems related to electrical engineering disciplines and conduct laboratory experiments for appropriate simulation of engineering problems and other specialties

4-Course contents	
Topics	**Week**
Simple harmonic motion	1
Simple harmonic motion	2
Damped harmonic motion	3
forced harmonic motion	4
Types of waves	5
Standing waves	6
Sound waves.	7
Interference	8
Mid Term Exam	9
Polarization.	10
Diffraction, Fiber optics	11
relativity	12
Black body radiation, photoelectric effect, and Compton effect. And De Broglie`s hypothesis.	13
Wave function, Uncertainty principle and Schrodinger equation.	14,15

5. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO4	√	√			√		√	√				
CLO5	√		√		√		√	√				
CLO22	√	√	√		√	√	√	√				

6. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	×
2	Online lectures and assignments	×

7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	-------
2	Reports	CLO22
3	Sheets	CLO4,CLO22
4	Quizzes	CLO22
5	Mid-term Exam	CLO4,CLO22
6	Oral/ Practical Exam	CLO5,CLO22
7	Final Exam	CLO4,CLO5,CLO22

7.2 Assessment Schedule		
No.	**Assessment Method**	**Weeks**
1	Attendance	Weekly
2	Reports	Bi-weekly
3	Sheets	Weekly
4	Quizzes	Bi-weekly
5	Mid-term Exam	9
6	Oral/ Practical Exam	15
7	Final Exam	16

7.3 Weighting of Assessments			
	Assessment Method	**Weights%**	**Weights**
Teacher Opinion	Reports / sheets / Activities	-	-
	Attendance	-	-
	Quizzes	6.6%	10
	Mid-term exam	13.3%	20
Practical / Oral	Practical Attendance	3.33%	5
	Lab. Reports	3.33%	5
	Lab. Activities / Projects		
	Final oral / practical exam	13.3%	20
Final Exam		60%	90
Total		100%	150

8. List of References

1. R. A. Serway and J.W. Jewett, "Physics for Scientists and Engineers", 6th Edition, Thomson Brooks/Cole 2014.
2. Edward M. Purcell and David J. Morin, “Electricity and Magnetism”, 3rd Edition, Cambridge University, 2013.
3. Larsen and Keller Education, “Solid State Physics”, June 27, 2019

9. Facilities required for teaching and learning

Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

10. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	Simple harmonic motion	1	CLO4
2	Simple harmonic motion	1	CLO4, CLO22
3	Damped harmonic motion	1	CLO4, CLO22
4	forced harmonic motion **Labs. Simple Pendulum**	1	CLO4,CLO5,CLO22
5	Types of waves	1	CLO4,CLO5,CLO22
6	Standing waves	1	CLO4,CLO5,CLO22
7	Sound waves.	1	CLO4,CLO5,CLO22
8	Interference **Labs. Young`s double slits**	1	CLO4,CLO5,CLO22
10	Polarization.	1	CLO4,CLO5,CLO22
11	Diffraction, Fiber optics **Labs. Diffraction grating**	1	CLO4,CLO5,CLO22
12	relativity	1	CLO4,CLO5,CLO22
13	Black body radiation, photoelectric effect, and Compton effect. And De Broglie`s hypothesis. **Labs. Photoelectric effect**	1	CLO4,CLO5,CLO22
14	Wave function, Uncertainty principle and Schrodinger equation.	1	CLO4,CLO5,CLO22
15	Wave function, Uncertainty principle and Schrodinger equation	1	CLO4,CLO5,CLO22

11. Matrix of Program LOs with Course LOs

Program LOs		Course LOs	
PL2	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.	CLO4	Develop basics appropriate to modern physics, quantum physics and their application in electrical physics.
		CLO5	Conduct appropriate experimentation to study Optical, modern physics.

PL12	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.	CLO22	Analyze method by applying the technology to solve technical problems related to electrical engineering disciplines and conduct laboratory experiments for appropriate simulation of engineering problems and other specialties

Title	Name	Signature
Course coordinator	**Dr. Ahmed Abdelbary**	
Program coordinator	**Ass.Prof. Dr. Osama Elgandour**	
Head of Department	**Ass.Prof. Dr. Osama Elgandour**	
Date of Approval	**3/9/2022**	

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Course Specification

Course Code: PHM 1113 **Course Title: mechanics (3)**

1. Basic information

Program Title	Electronics and Communication Engineering Depart.			
Department offering the program	Electronics and Communication Engineering Depart.			
Department offering the course	Engineering Mathematics and Physics department			
Course Code	PHM0103			
prerequisites	Mechanics1&2			
Year/level	First year / Level 2 (1st Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	2	0	5

2. Course Aims

No.	Aim
1	Identify centroid, center of gravity and moments of inertia and recognize the types of motion of a rigid body, force –acceleration methods and work and energy theorem. (AM1)

3. Course Learning Outcomes (CLOs)

CLO15	Acquire new knowledge about Second moment (moment of Inertia) and the Product of Inertia
CLO16	Acquire new knowledge about the translation, Rotation , general plane motion and virtual work
CLO17	Select some examples about centroid and moments of inertia problems, calculate velocity and acceleration of rigid body in different types of motion (translation, rotation ,general plane motion)

4. Course Contents

Topics	Week
- Center of gravity and center of mass for a system of particles, center of gravity and center of mass for a bod. -	1
- Composite bodies	2
- Definition of moments of inertia for areas, Moments of inertia for an area by integration.	3
- Parallel –axis theorem for an area, radius of gyration of an area.	4
- Product of inertia for an area.	5
- Moments of intertia of mass	6
- Rigid body motion, translation and rotation about fixed axis	7
- Rolling motion	8
- General plane motion	10
- Force and acceleration methods , equations of motion (translation and rotation about fixed axis) (part1)	11
- Force and acceleration methods , equations of motion (translation and rotation about fixed axis) (part2)	12
- Force and acceleration methods , equations of motion (general plane motion)	13
- Work and energy.	14
- Impulse and momentum.	15

5. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO15	√	√			√							
CLO16	√	√			√				√			
CLO17	√	√			√				√			

6. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	√
2	Online lectures and assignments	√

7.Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Attendance	-------
2	Reports	CLO15, CLO17
3	Sheets	CLO15, CLO16, CLO17
3	Quizzes	CLO15,CLO16
4	Mid-term Exam	CLO15, CLO16, CLO17
5	Final Exam	CLO15, CLO16, CLO17

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports	Bi-weekly
3	Sheets	Weekly
3	Quizzes	Bi-weekly
4	Mid-term Exam	9
6	Final Exam	16

7.3 weighting of Assessment

	Assessment Method	Weights %	Weights
Teacher Opinion	Reports / sheets / Activities	5%	5
	Attendance	5%	5
	Quizzes	10%	10
	Mid-term exam	20%	20
Final Exam		60%	60
Total		100%	100

8. List of References

- [1] Engineering Mechanics: Statics (11th Edition) R.C. HIBBELER -2008
- [2]Engineering Mechanics: Statics (13th Edition) R.C. HIBBELER -2009
- [3]Engineering Mechanics: Dynamics (13th Edition) R.C. HIBBELER -2009
- [4]Engineering Mechanics: Dynamics (13th Edition) R.C. HIBBELER -2009
- [5]Engineering Mechanics: Dynamics (15th Edition) R.C. HIBBELER -2021
- [6]Engineering Mechanics: Statics (15th Edition) R.C. HIBBELER -2021

9. Facilities required for teaching and learning

Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

10. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	- Center of gravity and center of mass for a system of particles, center of gravity and center of mass for a body.	1	CLO15, CLO17
2	- Composite bodies	1	CLO15, CLO17
3	- Definition of moments of inertia for areas, Moments of inertia for an area by integration.	1	CLO15, CLO17
4	- Parallel –axis theorem for an area, radius of gyration of an area.	1	CLO15, CLO17
5	- Product of inertia for an area.	1	CLO15, CLO17
6	- Moments of intertia of mass.	1	CLO15, CLO17
7	- Rigid body motion, translation and rotation about fixed axis	1	CLO16, CLO17
8	- Rolling motion	1	CLO17
10	- General plane motion	1	CLO4, CLO5, CLO8
11	- Force and acceleration methods , equations of motion (translation and rotation about fixed axis) (part1)	1	CLO16, CLO17
12	- Force and acceleration methods , equations of motion (translation and rotation about fixed axis) (part2)	1	CLO16, CLO17
13	- Force and acceleration methods , equations of motion (general plane motion)	1	CLO16, CLO17
14	- Work and energy.	1	CLO16, CLO17
15	- Impulse and momentum.	1	CLO17, CLO17

11. Matrix of Program LOs with Course Los

Program LOs		Course Los	
PLO10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	CLO15	Acquire new knowledge about Second moment (moment of Inertia) and the Product of Inertia
		CLO16	Acquire new knowledge about the translation, Rotation , general plane motion and virtual work
PLO11	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.	CLO17	Select some examples about centroid and moments of inertia problems, calculate velocity and acceleration of rigid body in different types of motion (translation, rotation ,general plane motion)

Title	Name	Signature
Course coordinator	**Dr. Wafaa Diab**	
Program coordinator	**Ass.Prof.Dr.Osama Elgandour**	
Head of Department	**Ass.Prof.Dr.Osama Elgandour**	
Date of Approval	**3/9/2022**	

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Course Specification

Course Code: CSE1211 **Course Title: Computer Programing**

1. Basic information

Program Title	Electronics and Communication Engineering Depart.			
Department offering the program	Electronics and Communication Engineering Depart.			
Department offering the course	Electronics and Communication Engineering Depart.			
Course Code	CSE1211			
Prerequisite	---			
Year/level	First Year / Second Level			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	2		5

2. Course Aims

No.	Aim
1	Solve engineering problems, making use of Matlab (AM3).

3. Learning Outcomes (LOs)

CLO.5	Conduct simulation to solve engineering problems. Analyze data and evaluate findings. Use objective engineering judgment to draw conclusions.
CLO.14	Use flexible thinking and acquire skills to anticipate and respond to new situations.

4. Course Contents

Topics	Week
Introduction to Matlab, Matlab layout (m-file, command window, workspace), use help, **variable types**, write a simple equation using exponential and trigonometric functions.	1
Generate a **matrix,** calculate its size and find max, min, and sum of its elements. Generate a **matrix** of zeros, random numbers, and ones.	2
Matrix: multiplication, deviation, inverse, determinant, and transpose. **Solving engineering problems:** Solving linear system of equations, calculate current and voltage in an electric circuit using invers and determinant of matrix, and using Cramer method by matrix properties.	3
Data representation: Draw continues/discrete curve using plot command. Draw two curves in the same figure using subplot, hold Write title, x label, y label, and z label. Draw an image-using matrix.	4
Data representation: Data representation as pie, bar. Draw polar coordinate plot for circle, cardioid, lemniscate, and rose curve. Draw 3D colored surfaces and contour.	5
Algorithms, flow charts, **Input and output commands**, **Decision making** (if-else) **solving** quadratic equation- student grade calculation.	6
Loops (for, switch-case), and **nested loops**: Calculator, Factorial, and different engineering programs, **find and correct the errors in a program**, find the output of a program.	7
Functions: write and call. Draw sine wave, half wave, and full wave, and add noise to signal.	8
Midterm	9
Solving engineering problems: Curve fitting and interpolation. Draw a stair surface.	10
Solving engineering problems: Solve equations; find differentiation, integration, integration, and area under a curve, Laplace, inverse Laplace, limits, and Fourier transform.	11
Application of matrix: in image processing: Flip, rotate, and resize. Draw image components: red, green, blue.	12
Application of matrix: Convert a color image into black and white.	13
Application of matrix: Image segmentation.	14

5. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO.5	√	√	√		√				√			
CLO.14	√	√	√		√				√			

6. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Written exam	CLO.5, CLO.14
2	Practical	CLO.5, CLO.14
3	Assignments	CLO.5, CLO.14
4	Simulations	CLO.5, CLO.14

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Sheets	Weekly
2	Mid-term Exam	9
3	Final Exam	16

7.3 Weighting of Assessments					
	Assessment Method	**Weights%**	**Weights**	**Weights%**	**Weights**
Teacher Opinion	Sheets	40%	40	20%	20
	Mid-term exam			%20	20
Final Exam		60%	60		
Total		100	100		

8. List of References

[1] HP Huang. "50 Basic Examples for Matlab " v. 2012.3
[2] David Houcque Northwestern University. "INTRODUCTION TO MATLAB FOR ENGINEERING STUDENTS" (version 1.2, August 2005)
[3] Dorothy C. Attaway, A Practical Introduction to Programming and Problem Solving, 2022

9. Facilities required for teaching and learning

Lecture
White board
Data show
Laboratory Usage

10. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	**Introduction to Matlab**, Matlab layout (m-file, command window, workspace), use help, **variable types**, write a simple equation using exponential and trigonometric functions.	1	CLO.5
2	Generate a **matrix,** calculate its size and find max, min, and sum of its elements. Generate a **matrix** of zeros, random numbers, and ones.	1	CLO.5
3	**Matrix**: multiplication, deviation, inverse, determinant, and transpose.	1	CLO.5, CLO.14

	Solving engineering problems: Solving linear system of equations, calculate current and voltage in an electric circuit using invers and determinant of matrix, and using Cramer method by matrix properties.		
4	**Data representation**: Draw continues/discrete curve using plot command. Draw two curves in the same figure using subplot, hold Write title, x label, y label, and z label. Draw an image-using matrix.	1	CLO.5
5	**Data representation:** Data representation as pie, bar. Draw polar coordinate plot for circle, cardioid, lemniscate, and rose curve. Draw 3D colored surfaces and contour.	1	CLO.5
6	**Algorithms**, flow charts, **Input and output commands**, **Decision making** (if-else) **solving** quadratic equation- student grade calculation.	1	CLO.5, CLO.14
7	**Loops** (for, switch-case), and **nested loops**: Calculator, Factorial, and different engineering programs, **find and correct the errors in a program**, find the output of a program.	1	CLO.5, CLO.14
8	**Functions**: write and call. Draw sine wave, half wave, and full wave, and add noise to signal.	1	CLO.5, CLO.14
9	**Midterm**		
10	**Solving engineering problems:** Curve fitting and interpolation. Draw a stair surface.	1	CLO.5, CLO.14
11	**Solving engineering problems:** Solve equations; find differentiation, integration, integration, and area under a curve, Laplace, inverse Laplace, limits, and Fourier transform.	1	CLO.5
12	**Application of matrix:** in image processing: Flip, rotate, and resize. Draw image components: red, green, blue.	1	CLO.5, CLO.14
13	**Application of matrix:** Convert a color image into black and white.	1	CLO.5, CLO.14
14	**Application of matrix:** Image segmentation.	1	CLO.5, CLO.14

11. Matrix of Program LOs with Course Los

Program Los		**Course Los**	
PL.2	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	CLO.5	Conduct simulation to solve engineering problems. Analyze data and evaluate findings. Use objective engineering judgment to draw conclusions.

PL.9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	CLO.14	Use flexible thinking and acquire skills to anticipate and respond to new situations.

Title	Name	Signature
Course coordinator	**Dr. Enas Mahmoud Elgbbas**	
Program coordinator	**Assoc. Prof. Dr. Osama ELghandour**	
Head of Department	**Assoc. Prof. Dr. Osama ELghandour**	
Date of Approval	**3/09/2022**	

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Course Specification

Course Code: ECE1211 **Course Title: Electronic Engineering**

1. Basic information

Program Title	Electronics and Communication Engineering Depart.			
Department offering the program	Electronics and Communication Engineering Depart.			
Department offering the course	Electronics and Communication Engineering Depart.			
Course Code	ECE1211			
Prerequisite	--			
Year/level	First year / Second Semester (2nd Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	4	2	0	6

2. Course Aims

No.	Aim
1	Identify Engineering fundamentals based on physical science. (AM1)
2	Analyze the electronic components and devices, and become familiar with circuits using these electronic components.(AM5)

3. Learning Outcomes (LOs)

CLO.1	Identify Engineering fundamentals based on physical science.
CLO.3	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.
CLO.22	Analyze an electronic system or component for a specific application; and identify the tools required to optimize this design.

4. Course Contents

Topics	Week
Semiconductor physics: Semiconductor physics	1
Semiconductor physics: Diodes physics	2
Diodes applications: Full wave circuits	3
Diodes applications: Half wave circuits and power supply	4
Diodes applications: Clipper circuits	5
Diodes applications: Clampers	6
Diodes applications: Clampers and voltage doubler circuits.	7
Zener diodes and its applications.	8
Midterm	9
Bipolar junction transistor: Physics	10
Bipolar junction transistor: DC Biasing configuration (1)	11
Bipolar junction transistor: DC Biasing configuration (2)	12
Unipolar Junction transistor: physics	13
Unipolar Junction transistor: DC biasing	14
Practical Exam	15

5. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO.1	√	√			√							
CLO.3	√	√			√				√			
CLO.22	√	√			√				√			

6. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional tutorials	√

7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Written exam	CLO.1, CLO.3, CLO22
7	Assignments	CLO.1, CLO.3, CLO22
10	Simulation	CLO.22

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Assignments	Bi-weekly
4	Mid-term Exam	9
5	Simulation	15
6	Final Exam	16

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets / Activities	40%	40	5%	5
	Attendance			5%	5
	Simulation			10%	10
	Mid-term exam			20%	20
Final Exam		60%	60		60
Total			100		100

8. List of References

[1] B. Razavi, "Fundamentals of Microelectronics," third edition, 2021.
[2] T. L. Floyd, "Electronic devices: electron flow version", 9th edition ed., New Jersey: Prentice Hall, 2012.

9. Facilities required for teaching and learning

Lecture

White board

10. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	Semiconductor physics: Semiconductor physics	1	CLO.1
2	Semiconductor physics: Diodes physics	1	CLO.1
3	Diodes applications: Full wave circuits	2	CLO.3, CLO.22
4	Diodes applications: Half wave circuits and power supply	2	CLO.3, CLO.22
5	Diodes applications: Clipper circuits	2	CLO.3, CLO.22
6	Diodes applications: Clampers	2	CLO.3, CLO.22

7	Diodes applications: Clampers and voltage doubler circuits.	2	CLO.3, CLO.22
8	Zener diodes and its applications.	2	CLO.3, CLO.22
9	Midterm		
10	Bipolar junction transistor: Physics	1	CLO.1
11	Bipolar junction transistor: DC Biasing configuration (1)	2	CLO.3, CLO.22
12	Bipolar junction transistor: DC Biasing configuration (2)	2	CLO.3, CLO.22
13	Unipolar Junction transistor: physics	1	CLO.1
14	Unipolar Junction transistor: DC biasing	2	CLO.3, CLO.22

11. Matrix of Program LOs with Course Los

Program LOs		Course Los	
PL1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO.1	Identify Engineering fundamentals based on physical science.
		CLO.3	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.
PL12	Design model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.	CLO.22	Analyze an electronic system or component for a specific application; and identify the tools required to optimize this design.

Title	Name	Signature
Course coordinator	**Dr. Amira Nabil**	Amira Nabil
Program coordinator	**Assoc. Prof. Dr. Osama ELghandour**	
Head of Department	**Assoc. Prof. Dr. Osama ELghandour**	
Date of Approval	**3/09/2022**	

برنامج هندسة الالكترونيات والاتصالات
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Course Specification

Course Code: EPE1211 **Course Title: Electric Circuits (2)**

1. Basic information

Program Title	Electronic and Communication Eng. Department			
Department offering the program	Electronic and Communication Eng. Department			
Department offering the course	Electrical Power Engineering Depart.			
Course Code	EPE1211			
Prerequisties	EPE1111			
Year/level	First year / Second Semester (2nd Level)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	2	0	5

2. Course Aims

No.	Aim
1	Analyze results of numerical solutions to different circuits and appreciate their limitation. (AM2)

3. Learning Outcomes (LOs)

CLO10	Supervise the concepts of complex power applications in electrical AC circuits.
CLO11	Monitor the concept and methodologies of different three phase AC systems.
CLO21	Model types of filters and different ways of two port network.
CLO22	Analayze the main principles of transient and resonance analysis.

4. Course Contents

Topics	Week
Complex Power Calculations in AC Circuits.	1
Apparent Power, Power Factor, Circuits with Nonlinear Resistance.	2
Three Phase AC Analysis.	3
Balanced Three Phase Systems.	4
Unbalanced Three Phase Systems.	5
Transient Analysis.	6
Transient Analysis of First Order Circuits.	7
Transient Analysis of Second Order Circuits.	8
Mid Term Exam	9
Resonance Circuits	10
Series Resonance Circuits	11
Parallel Resonance Circuits	12
General Resonance Circuits.	13
Two Port Networks	14
Filters Types.	15

5. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO10	√	√			√						√	
CLO11	√	√				√	√					√
CLO21	√	√					√				√	√
CLO22	√	√			√	√						

6. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	√
2	Online lectures and assignments	√

7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	-------
2	Reports	CLO10, CLO21.
3	Sheets	CLO10, CLO11, CLO21, CLO22.
4	Quizzes	CLO11, CLO22.
5	Mid-term Exam	CLO10, CLO11.
6	Final Exam	CLO10, CLO11, CLO21, CLO22.

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports	Bi-weekly
3	Sheets	Weekly
4	Quizzes	Bi-weekly
5	Mid-term Exam	9
6	Final Exam	16

7.3 weighting of Assessment

	Assessment Method	Weights %	Weights
Teacher Opinion	Reports / sheets / Activities	5%	5
	Attendance	5%	5
	Quizzes	10%	10
	Mid-term exam	20%	20
Final Exam		60%	60
Total		100%	100

8. List of References

[1] JHON O'MALLY, ''Basic Circuit Analysis Theory and Problems'', second edition, , 1992.
[2]' Electric circuit theory and technology'', second edition, Jhon Bird, 2003.

[3] ''Fundamentals of Electric Circuits'', Charles Alexannder, fifth edition, 2012.

9. Facilities required for teaching and learning

Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Data show

10. Matrix of Course Content with Course LO's

Week No.	Topics	Aim	LO's
1	Complex Power Calculations in AC Circuits.	1	CLO10.
2	Apparent Power, Power Factor, Circuits with Nonlinear Resistance.	1	CLO10.
3	Three Phase AC Analysis.	1	CLO11.
4	Balanced Three Phase Systems.	1	CLO11.
5	Unbalanced Three Phase Systems.	1	CLO11.
6	Transient Analysis.	1	CLO22.
7	Transient Analysis of First Order Circuits.	1	CLO22.
8	Transient Analysis of Second Order Circuits.	1	CLO22.
10	Resonance Circuits	1	CLO22.
11	Series Resonance Circuits	1	CLO22.
12	Parallel Resonance Circuits	1	CLO22.
13	General Resonance Circuits.	1	CLO22.
14	Two Port Networks	1	CLO21.
15	Filters Types.	1	CLO21.

11. Matrix of Program LOs with Course LOs

Program LOs		Course LOs	
PL6	Plan, supervise and monitor implementation of engineering projects, taking into	CLO10	Supervise the concepts of complex power applications in electrical AC circuits.
		CLO11	Monitor the concept and methodologies of different three phase AC systems.

	consideration other trades requirements.		
PL12	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.	CLO21	Model types of filters and different ways of two port network.
		CLO22	Analayze the main principles of transient and resonance analysis.

Title	Name	Signature
Course coordinator	**Dr. Zeinab Gamal Hassan**	
Program coordinator	**Assoc.Prof. Dr. Osama ELghandour**	
Head of Department	**Assoc.Prof. Dr. Osama ELghandour**	
Date of Approval	**3/9/2022**	

برنامج هندسة الالكترونيات والاتصالات
المعهد العالي للهندسة والتكنولوجيا
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Course Specification

Course Code: EPE1212 Course Title: Electrical measurements

1. Basic information

Program Title	Electronics and Communication Engineering Depart.			
Department offering the program	Electronics and Communication Engineering Depart.			
Department offering the course	Electrical Power Engineering Depart.			
Course Code	**EPE1212**			
Prerequisite	---			
Year/level	Year 1/ Level 2 (2nd Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	2	0	5

2. Course Aims

No.	Aim
1	Apply knowledge of mathematics, science and engineering concepts to the solution of Electrical measurements problems. (AM1)
2	Adapt successfully to changing technologies in Electrical measurements devices. (AM3)

3. Course Learning Outcomes (CLOs)

CLO22	analyze measuring devices for a specific application;
CLO26	Measure various electrical quantities in the power systems.

4.Material covered /week	
Topics	**Week**
Introduction to electrical measurements, errors	1
Accuracy and precision.	2
PMMCI construction and operation	3
DC ammeters, extension for range and Ayrton shunt.	4
DC voltmeters, & extension for range.	5
Resistance measurements, Wheatstone bridge, & AC bridges	6 &7
Sensors and transducers	8
Mid Term exam	9
Oscilloscopes	10 & 11
AC measurements	12& 13
Potentiometers and voltage measurements	14 & 15

5. Teaching and Learning methods

Course learning Outcomes (CLOs)	Teaching and Learning Methods											
	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO22	√	√		√		√			√			√
CLO26	√	√		√		√			√			√

6. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	√
2	Online lectures and assignments	√

7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	CLOs
1	Attendance	--
2	Reports	CLO 22
3	Sheets	CLO 22- CLO 26
4	Quizzes	CLO 22
5	Mid-term Exam	CLO 22
6	Final Exam	CLO 22- CLO 26

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports	3&10
3	Sheets	Weekly
4	Quizzes	7&11

5	Mid-term Exam	9
6	Final Exam	16

	Assessment Method	Weights%	Weights
Teacher Opinion	Reports	3%	3
	sheets	2%	2
	Attendance	5%	5
	Quizzes	10%	10
	Mid-term exam	20%	20
Final Exam		60%	60
Total		100%	100

8. List of References

-David A. Bell, "Electronic Instrumentation & Measurements" - PHI, 2nd Edition, 2003.
- John G. Webster, Halit Eren, "Measurements, Instrumentation, and Sensors Handbook", CRC press, 2017.
E. W. Golding and F. C. Widdis, Electrical Measurements and Measuring Instruments, 7th ed. New York, NY: Springer, 2021.
-J. Fraden, Handbook of Modern Sensors: Physics, Designs, and Applications, 5th ed. New York, NY: Springer, 2022.
-A. S. Morris and R. Langari, Measurement and Instrumentation: Theory and Application, 3rd ed. Oxford, UK: Elsevier, 2020.

9. Facilities required for teaching and learning

Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, etc.)

10.Matrix of Course Content with Course LO's

Week no#	Topics	Aim	CLO's
1	Introduction to electrical measurements, errors	1	CLO26
2	Accuracy and precision.	1	CLO26
3	PMMCI construction and operation	1&6	CLO22,CLO26
4	DC ammeters, extension for range and Ayrton shunt.	1&6	CLO22,CLO26
5	DC voltmeters, & extension for range.	1&6	CLO22,CLO26
6 &7	Resistance measurements, Wheatstone bridge, & AC bridges	1&6	CLO22,CLO26
8 & 9	**Sensors and transducers**	1&6	CLO22,CLO26
10 & 11	**Oscilloscopes**	1&6	CLO22,CLO26
12& 13	**AC measurements**	1&6	CLO22,CLO26
14 & 15	**Potentiometers and voltage measurements**	1&6	CLO22,CLO26

11. Matrix of Program LOs with Course LOs

Program LOs		Course LOs	
PL12	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.	CLO22	analyze measuring devices for a specific application;
PL14	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.	CLO26	measure various electrical quantities in the power systems.

Title	Name	Signature

Course coordinator	**Dr. Dina Rostom**	
Program coordinator	**Ass. Prof. Dr. Osama El Ghandour**	
Head of Department	**Ass. Prof. Dr. Osama El Ghandour**	
Date of Approval	**3/09/2022**	

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Course Specification

Course Code: HUM1103 **Course Title: Engineering economy**

1. Basic information

Program Title	Electronics and Communication Engineering Depart.			
Department offering the program	Electronics and Communication Engineering Depart.			
Department offering the course	Engineering Mathematics and Physics department			
Course Code	HUM1103			
Prerequisite	None			
Year/level	First year / second Semester (First level)			
Specialization	**Minor**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	2	1	0	2

2. Course Aims

No.	Aim
1	Understanding the basic terminology, concepts, and principles of Engineering Economy. Train the student in how to find engineering information, both in traditional ways and on the Internet. This is achieved through Understanding the time value of money, Break-even point (BEP), Rate of Return, Replacement policy, Depreciation rates, Inflation, and concepts of cost accounting. Analyze the breakeven point (BEP), assess the benefit/cost, make decision, and choose between alternatives, estimate Rate of Return, and calculate rate of depreciation of assets. (AM6)

3. Learning Outcomes (LOs)	
CLO 6	Applying principle in estimating cost, the international codes, standards, electrical requirements, professional ethics, and the effect of income tax and depreciation in creating electrical engineering economic decision.
CLO 8	practice techniques and methods of sensitivity analysis and predicted value decisions.

4. Course Contents

Topics	Week
Introduction to Engineering Economy.	1
Application on Engineering Economy.	2
Engineering Costs.	3
Cost Estimating.	4
Proplems on Cost Estimating	5
The time value of money.	6
Problems on the time value of money.	7
Analysis of Alternatives	8
Mid Term Exam	9
Comparison of Alternatives	10
Replacement analysis	11
Benefit-cost analysis.	12
Problems on Replacement analysis	13
Problems on Benefit-cost analysis	14
Revision	15

5. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO 6	√	√			√	√	√	√			√	√
CLO 8	√	√			√	√	√	√			√	√

6. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	×
2	Online lectures and assignments	×

7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Attendance	-------
2	Reports	CLO 6,CLO8
3	Sheets	CLO 6,CLO8
4	Quizzes	CLO 6,CLO8
5	Mid-term Exam	CLO 6,CLO8
6	Final Exam	CLO 6,CLO8

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports	Bi-weekly
3	Sheets	Weekly
4	Quizzes	Bi-weekly
5	Mid-term Exam	9

6	Final Exam	16

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets / Activities	40 %	40	5%	5
	Attendance			5%	5
	Quizzes			10%	10
	Mid-term exam			20%	20
Final Exam		60 %			60
Total			100		100

8. List of References

[1] Textbook: William G. Sullivan, Elin M. Wicks and C. Patrick Koelling. "Engineering Economy" Sixteenth Edition & Fourteenth Edition.
[2] Textbook: Donald Newnan, Ted Eschenbach, Jerome Lavelle-Engineering Economic Analysis-Oxford University Press (2012).
[3] Leland Blank Anthony J Tarquin Engineering economy New York NY Mc Graw Hill Education 2018.

9. Facilities required for teaching and learning

Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

10. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	Introduction to Engineering Economy.	1	CLO 6
2	Application on Engineering Economy.	1	CLO 6
3	Engineering Costs.	1	CLO 6 ,CLO8
4	Cost Estimating.	1	CLO 6 ,CLO8

5	Proplems on Cost Estimating	1	CLO 6 ,CLO8
6	The time value of money.	1	CLO 6 ,CLO8
7	Problems on the time value of money.	1	CLO 6 ,CLO8
8	Analysis of Alternatives	1	CLO 6 ,CLO8
9	Midterm	1	CLO 6 ,CLO8
10	Comparison of Alternatives	1	CLO 6 ,CLO8
11	Replacement analysis	1	CLO 6 ,CLO8
12	Benefit-cost analysis.	1	CLO 6 ,CLO8
13	Problems on Replacement analysis	1	CLO 6 ,CLO8
14	Problems on Benefit-cost analysis	1	CLO 6 ,CLO8
15	Revision	1	CLO 6 ,CLO8

11. Matrix of Program LOs with Course Los

Program LOs		Course Los	
PL3	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.	CLO 6	Applying principle in estimating cost, the international codes, standards, electrical requirements, professional ethics, and the effect of income tax and depreciation in creating electrical engineering economic decision.
PL5	Practice research techniques and methods of investigation as an inherent part of learning.	CLO 8	practice techniques and methods of sensitivity analysis and predicted value decisions.

Title	Name	Signature
Course coordinator	**Dr. Nagwa Hussien**	

Program coordinator	**Ass.Prof. Dr. Osama Elgandour**	
Head of Department	**Ass.Prof. Dr. Osama Elgandour**	
Date of Approval	**3/9/2022**	

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Course Specification

Course Code: PHM 1211 **Course Title: Mathematics (4)**

1. Basic information

Program Title	Electronic and Communication Eng. Department			
Department offering the program	Electronic and Communication Eng. Department			
Department offering the course	Physics and Mathematical Engineering			
Course Code	PHM 1211			
prerequisite	Mathematics 1,2			
Year/level	First year / Second Semester (second Level)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	4	2	0	6

2. Course Aims

No.	Aim
1	Apply the theoretical knowledge and practical to deal with Fourier series, Laplace transform and inverse Laplace ,solve system of equations, Partial Differential Equations and vector analysis.(AM1)

3. Learning Outcomes (LOs)

CLO4	Develop the concepts and theories of Fourier series, classification of PDEs and interpolation for electrical systems.
CLO5	Conduct solution method for Partial differential equation, and vector analysis for different systems.
CLO22	Analyze methods of Laplace transform, Inverse Laplace for different system.

4-course contents

Topics	Week
Interpolation-Fourier Series	1
Interpolation-Fourier Series	2
Interpolation-Fourier Series	3
Curve fitting- classification and solve partial DifferentialEquations(PDEs).	4
Curve fitting- Wave Equation.	5
Laplace transform-inverse laplace transform.	6
inverse laplace transform.- Wave Equation	7
inverse laplace transform.- Heat Equation	8
Mid Term Exam	9
inverse laplace transform.- Heat Equation	10
Application on inverse Laplace-Vector anaylsis	11
Application on inverse Laplace-Vector anaylsis	12
Heaviside unit step(laplace transform)-Vector anaylsis	13
Heaviside unit step(inverse laplace transform)--Vector anaylsis	14
Revision	15

5-Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO4	√	√			√	√	√	√				
CLO5	√	√			√	√	√	√				
CLO22	√	√			√	√	√	√				

4. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	×
2	Online lectures and assignments	×

5. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Attendance	-------
2	Reports	
3	Sheets	CLO4,CLO,CLO22
4	Quizzes	
5	Mid-term Exam	CLO4, CLO22
6	Final Exam	CLO4,CLO5,CLO22

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	--------
2	Reports	Bi-weekly
3	sheets	Weekly
4	Quizzes	Bi-weekly

5	Mid-term Exam	9
6	Final Exam	16

7.3 Assessment Schedule

	Assessment Method	Weights%	Weights
Teacher Opinion	Reports / sheets	10%	15
	Attendance	3.33%	5
	Quiz 1 / Quiz 2	10%	15
	Mid-term exam	26.6%	40
Final Exam		50%	75
Total		100%	150

8-List of References

[1] Erwin Kreyszig, Kreyszig Textbook: "Advanced Engineering Mathematics, 10th Edition- slader, 2018.

[2] Dennis G. Zill and Michael R. Cullen, "Differential Equations with Boundary Problem", seven edition, PWS Publishers; published simultaneously in Canada 2015.

[3] William E. Boyce, Richard:" Elementary Differential Equations and Boundary Value Problems", 8th Edition Wiley, Publisher John Wiley & Sons, Inc., 2014.

9-Facilities required for teaching and learning

Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

10-Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	Interpolation-Fourier Series	1	CLO4
2	Interpolation-Fourier Series	1	CLO4
3	Interpolation-Fourier Series	1	CLO4
4	Curve fitting- classification and solve partial DifferentialEquations(PDEs).	1	CLO4
5	Curve fitting- Wave Equation.	1	Clo4,clo5
6	Laplace transform-inverse laplace transform.	1	Clo22
7	inverse laplace transform.- Wave Equation	1	Clo22,clo5
8	inverse laplace transform.- Heat Equation	1	Clo22,clo5
10	inverse laplace transform.- Heat Equation	1	Clo22,clo5
11	Application on inverse Laplace-Vector anaylsis	1	Clo22,clo5
12	Application on inverse Laplace-Vector anaylsis	1	Clo22,clo5
13	Heaviside unit step(laplace transform)-Vector anaylsis	1	Clo22,clo5
14	Heaviside unit step(inverse laplace transform)--Vector anaylsis	1	Clo22,clo5
15	Revision	1	Clo22,clo5,clo4

6. Matrix of Program LOs with Course Los

Program LOs		Course Los	
PL2	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.	CLO4	Develop the concepts and theories of Fourier series, classification of PDEs and interpolation for electrical systems.
		CLO5	Conduct solution method for Partial differential equation, and vector analysis for different systems.
PL12	Design, model and analyze an electrical/electronic/digital system or component For a specific application: and identify the tools required to optimize this design.	CLO22	Analyze methods of Laplace transform, Inverse Laplace for different system.

Title	Name	Signature
Course coordinator	**Dr. Eman Abdelaziz**	
Program coordinator	Ass.Prof.Dr Osama Elghandour	
Head of Department	Ass.Prof.Dr Osama Elghandour	
Date of Approval	**3/9/2022**	

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