

	Ministry of Higher Education Higher Institute of Engineering and Technology Electrical Power Engineering Department	
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Course Specification	
Course Code: PHM 1211	Course Title: Mathematics (4)

1. Basic information				
Program Title	Electrical Power Engineering Department			
Department offering the program	Electrical Power Engineering Department			
Department offering the course	Physics and Mathematical Engineering			
Course Code	PHM 1211			
prerequisite	PHM0101, PHM0201			
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 to deal with Fourier series, Laplace transform and inverse Laplace, solve a 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.



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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 Differential Equations(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
inverse laplace transform.- Heat Equation	10
Application on inverse Laplace-Vector analysis	11
Application on inverse Laplace-Vector analysis	12
Heaviside unit step(laplace transform)-Vector analysis	13
Heaviside unit step(inverse laplace transform)--Vector analysis	14
Revision	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
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	CLO4
2	Reports	CLO4,CLO5
3	Sheets	CLO4,CLO5 ,CLO22
4	Quizzes	CLO4, CLO22
5	Mid-term Exam	CLO4, CLO22
6	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	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

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.)

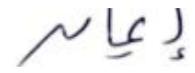
10. Matrix of Course Content with Course LO's

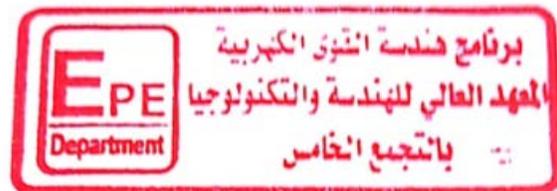
No.	Topics	Aim	LO's
1	Interpolation-Fourier Series	1	CLO4
2	Interpolation-Fourier Series	1	CLO4
3	Interpolation-Fourier Series	1	CLO4
4	Curve fitting- classification and solve partial Differential Equations(PDEs).	1	CLO4
5	Curve fitting- Wave Equation.	1	Clo4,clo5
6	Laplace transform-inverse laplace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

11. Matrix of Program LOs with Course Los

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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	Dr. Hend Salama	
Head of Department	Ass.Prof.Dr Osama Elghandour	
Date of Approval	3/9/2023	



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Course Specification

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

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

5. 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)

6. 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)

7. 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 inertia 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

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- Force and acceleration methods , equations of motion (general plane motion)	13
- Work and energy.	14
- Impulse and momentum.	15

8. Teaching and Learning methods

Course learning Outcome	Teaching and Learning Methods
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s (LOs)	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
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	CLO15
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] Erwin Kreyszig, "Advanced Engineering Mathematics" John Wiley & Sons Inc., 10th Edition, 2010.
- [4] Ferdinand P. Beer and E. Russell Johnston, Jr." Vector Mechanics for Engineers"

Dynamics Metric Edition adapted by G. Wayne Brown, Sir Sandford Fleming College, New York 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	- 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 inertia 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



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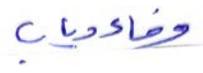
12	- Force and acceleration methods , equations of motion (translation and rotation about fixed axis) (part2)	1	CLO16, CLO17
13	- Force and acceleration methods , equations of motion (general plane motion)	1	CLO16, CLO17
14	- Work and energy.	1	CLO16, CLO17
15	- Impulse and momentum.	1	CLO17, CLO17

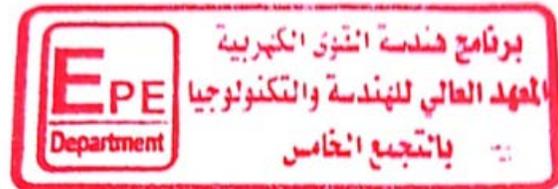
11. Matrix of Program LOs with Course Los

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	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)

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	distribution of electrical power systems.
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Title	Name	Signature
Course coordinator	Dr. Wafaa Diab	
Program coordinator	Dr. Hend Abd-Elmonem Salama	
Head of Department	Ass.Prof.Dr.Osama Elgandour	
Date of Approval	3/9/2023	



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

9. Basic information	
Program Title	Electrical Power Engineering Depart.



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Department offering the program	Electrical Power Engineering Depart.			
Department offering the course	Physics and Mathematical Engineering			
Course Code	PHM1111			
prerequisite	PHM0101, PHM0201			
Year/level	First year / First Semester			(second Level)
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	4	2	0	6

10. Course Aims

No.	Aim
1	Apply the essential knowledge to understand some basics 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)

11. 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
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



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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



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CLO1	√			√		√	√				√	
CLO3	√		√	√		√	√			√	√	
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	CLO1
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



. 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.

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	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



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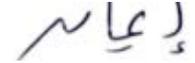
8	Double integral - Linear Differential Equations with constant coefficients	1	CLO3,CLO17,CLO19
10	Double integral - Linear Differential Equations with constant coefficients	1	CLO3,CLO17,CLO19
11	Triple Integral - Linear Differential Equations with constant coefficients	1	CLO3,CLO17,CLO19
12	Triple Integral - 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

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.	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
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Course coordinator	Dr. Eman Abdelaziz	
Program coordinator	Dr. Hend Salama	
Head of Department	Ass.Prof.Dr Osama Elghandour	
Date of Approval	3/9/2023	



Course Specification	
Course Code: HUM1103	Course Title: Engineering economy

12. Basic information	
Program Title	Electrical Power Engineering Depart.
Department offering the program	Electrical Power 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



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Electrical Power Engineering Department



Teaching Hours	Lectures	Tutorial	Practical	Total
	2	1	0	3

13. 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. <p style="text-align: right;">(AM6)</p>

14. 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



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Cost Estimating.	4
Problems on Cost Estimating	5
The time value of money.	6
Problems on the time value of money.	7
Analysis of Alternatives	8
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											
	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
CLO 6	√	√	√	√		√	√			√	√	√
CLO 8	√	√	√	√		√	√			√	√	√

6. Teaching and Learning methods of Disabled Students

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



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7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Attendance	CLO 6
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
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] 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).

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	Problems 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
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



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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	Dr.Hend Salama	
Head of Department	Ass.Prof. Dr. Osama Elgandour	

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Date of Approval	3/9/2023
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Course Specification	
Course Code: HUM1102	Course Title: Technical Writing

15. Basic information				
Program Title	Electrical power Engineering Department			
Department offering the program	Electrical power Engineering Department			
Department offering the course	Engineering Mathematics and Physics department			
Course Code	HUM1102			
Prerequisite	-----			
Year/level	First Year / First Semester (First level)			
Specialization	Minor			
Teaching Hours	Lectures	Tutorial	Practical	Total
	2	1	0	3

16. Course Aims	
No.	Aim



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Electrical Power Engineering Department



1	adapt successfully to apply techniques , skills and some english grammar and rules necessary for effectively writing different types of technical documents such as reports , proposal ,letters and presentations. (AM6)
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17. 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
Planning the technical report	2
Type of technical report	3
Parts of the technical report	4
The text of the Technical Report	5
Creating good tables and Instructional figures	6
Rules for Literature citations & Completion of the Technical Report	7



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Using word processing and desktop publishing (DTP) systems	8
Useful behavior for working on your project	10
Presenting the Technical Report	11
Planning time of presentation	12
Presenting the Technical Report using power point presentation	13
Informal Reports and writing manual	14
Solving problems with Sentence Construction	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
CLO 13	√	√	√	√		√	√			√	√	
CLO 14	√	√	√	√		√	√			√	√	

6. Teaching and Learning methods of Disabled Students

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



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7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	CLO 14
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



7.3 Weighting of Assessments

	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. H. Hering, "How to Write Technical Reports", Springer Berlin, Heidelberg, 2019.
2. P.A. Laplante, "Technical Writing: A Practical Guide for Engineers, Scientists, and Nontechnical Professionals", CRC Press, 2018.

9. Facilities required for teaching and learning

Lecture/Classroom

White board



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

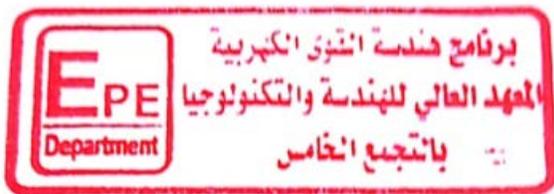
10. Matrix of Course Content with Course LO's

Week No.	Topics	Aim	LO's
1	Introduction	1	CLO 13
2	Planning the technical report	1	CLO 13 , CLO 14
3	Type of technical report	1	CLO 13
4	Parts of the technical report	1	CLO 13
5	The text of the Technical Report	1	CLO 13
6	Creating good tables and Instructional figures	1	CLO 13 , CLO 14
7	Rules for Literature citations & Completion of the Technical Report	1	CLO 13
8	Using word processing and desktop publishing (DTP) systems	1	CLO 14
10	Useful behavior for working on your project	1	CLO 13 , CLO 14
11	Presenting the Technical Report	1	CLO 13 , CLO 14
12	Planning time of presentation	1	CLO 13 , CLO 14
13	Presenting the Technical Report using power point presentation	1	CLO 13 , CLO 14
14	Informal Reports and writing manual	1	CLO 13
15	Solving Problems with Sentence Construction	1	CLO 13 , CLO 14

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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	Dr.Hend Salama	
Head of Department	Ass.Prof. Dr. Osama Elgandour	
Date of Approval	3/9/2023	



Course Specification

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Course Code: EPE1211	Course Title: Electric Circuits (2)
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18. Basic information				
Program Title	Electrical Power Engineering Depart.			
Department offering the program	Electrical Power Engineering Depart.			
Department offering the course	Electrical Power Engineering Depart.			
Course Code	EPE1211			
Prerequisites	EPE1111			
Year/level	First year / Second Semester (2 nd Level)			
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	2	0	5

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

20. 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.



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CLO22 Analyze the main principles of transient and resonance analysis.

21. 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
Resonance Circuits	10
Series Resonance Circuits	11
Parallel Resonance Circuits	12
General Resonance Circuits.	13
Two Port Networks	14

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Filters Types.	15
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22. Teaching and Learning methods	
Course learning Outcome	Teaching and Learning Methods



s (LOs)												
	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
CLO10	√		√	√							√	
CLO11	√	√		√		√	√			√		
CLO21	√	√		√			√			√	√	
CLO22	√		√	√		√						

23. Teaching and Learning methods of Disabled Students		
No.	Teaching Method	Reason
1	Additional Tutorials	√
2	Online lectures and assignments	√



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24. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	CLO21, CLO22.
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
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Teacher Opinion	Reports / sheets	5%	5
	Attendance	5%	5
	Quizzes	10%	10
	Mid-term exam	20%	20
Final Exam		60%	60
Total		100%	100

25. 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 Alexander, fifth edition, 2012.

26. Facilities required for teaching and learning

Lecture/Classroom

White board

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

Data show

27. Matrix of Course Content with Course LO's

Week No.	Topics	Aim	LO's
1	Complex Power Calculations in AC Circuits.	1	CLO10.



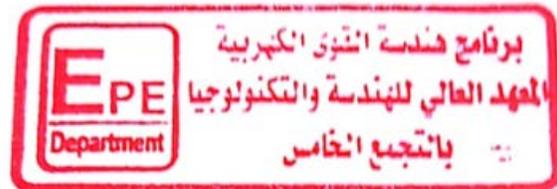
2	Apparent Power, Power Factor, Circuits with Nonlinear Resistance.	1	CLO10.
3	Three Phase AC Analysis.	1	CLO11.
4	Balanced Three Phase Systems.	1	CLO11.
5	Unbalanced Three Phase Systems.	1	CLO11.
6	Transient Analysis.	1	CLO22.
7	Transient Analysis of First Order Circuits.	1	CLO22.
8	Transient Analysis 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.

28. Matrix of Program LOs with Course LOs

Program LOs		Course LOs	
PL6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	CLO10	Supervise the concepts of complex power applications in electrical AC circuits.
		CLO11	Monitor the concept and methodologies of different three phase AC 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.	CLO21	Model types of filters and different ways of two port network.
		CLO22	Analyze the main principles of transient and resonance analysis.

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Title	Name	Signature
Course coordinator	Dr. Zeinab Gamal Hassan	
Program coordinator	Dr. Hend Abd-Elmonem Salama	
Head of Department	Assoc.Prof. Dr. Osama ELghandour	
Date of Approval	3/9/2023	



Course Specification	
Course Code: EPE 1112	Course Title: Physics (3)

29. Basic information	
Program Title	Electrical power Engineering Department
Department offering the program	Electrical power Engineering Department
Department offering the course	Engineering Mathematics and Physics department
Course Code	EPE1112
Prerequisites	PHM0102, PHM0202
Year/level	First Year / First Semester (First level)

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Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	4	1	1	6

30. Course Aims

No.	Aim
1	Design and conduct experiments of the basics of electrical physics including Electron in a matter, free electron theory, Energy distribution functions, Semiconductors, Superconductors and Nanotechnology. (AM2)

31. 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



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Standing waves	6
Sound waves.	7
Interference	8
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											
	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
CLO4	√			√		√	√				√	
CLO5	√				√	√	√				√	
CLO22	√			√	√	√	√			√	√	

6. Teaching and Learning methods of Disabled Students

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



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7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	CLO4
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



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7

Final Exam

16

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



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8. List of References

3. R. A. Serway and J.W. Jewett, "Physics for Scientists and Engineers", 6th Edition, Thomson Brooks/Cole 2014.
4. Edward M. Purcell and David J. Morin, "Electricity and Magnetism", 3rd Edition, Cambridge University, 2013.
5. 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

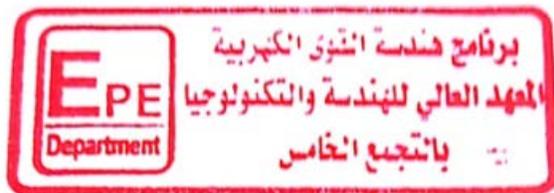
11. Matrix of Program LOs with Course LOs

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.

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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
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Title	Name	Signature
Course coordinator	Dr. Ahmed Abdelbary	
Program coordinator	Dr.Hend Salama	
Head of Department	Ass.Prof. Dr. Osama Elgandour	
Date of Approval	3/9/2023	



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

32. Basic information	
Program Title	Electrical Power Engineering Depart.



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

33. Course Aims

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

34. 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.



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35. 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
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



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36. Teaching and Learning methods

**Course
learning
Outcome**

Teaching and Learning Methods



s (LOs)	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
CLO15	√		√	√							√	
CLO16	√	√		√		√	√			√		
CLO17	√	√		√			√			√	√	
CLO19	√		√	√		√						

37. Teaching and Learning methods of Disabled Students

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



38. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	CLO16, CLO19.
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	5%	5
	Attendance	5%	5



	Quizzes	10%	10
	Mid-term exam	20%	20
Final Exam		60%	60
Total		100%	100

39. 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, Pearson prentice Hall, 2008..

40. Facilities required for teaching and learning

Lecture/Classroom

White board

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

Data show

41. 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.



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Electrical Power Engineering Department



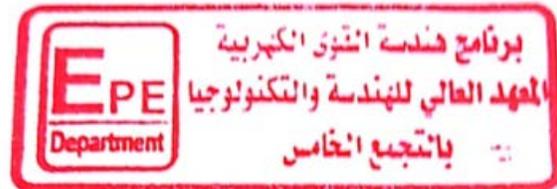
3	Basic Concepts of DC Circuits	1	CLO15.
4	Nodal Analysis	1	CLO16.
5	Mesh Theory	1	CLO16.
6	Source Transformation Theory	1	CLO16.
7	Super Position Theory	1	CLO16.
8	Thevenin's theory	1	CLO16.
10	Norton's Theory.	1	CLO16.
11	Calculation of maximum power using Thevenin's and Norton's Theories.	1	CLO16.
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.

42. Matrix of Program LOs with Course LOs

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Program LOs		Course LOs	
PLO10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	CLO15	Acquire the concepts of electrical DC and AC circuit analysis.
		CLO16	Apply the methodologies DC theories and study the criterion of solution.
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 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	Dr. Hend Abd-Elmonem Salama	
Head of Department	Assoc.Prof. Dr. Osama ELghandour	
Date of Approval	3/9/2023	





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CLO25

Estimate the performance of 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
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											
	Lectures (face to face / online)	Presentation	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation
CLO22	√		√	√		√		√		√		√
CLO25	√		√	√		√		√		√		√

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	CLO 22
2	Reports	CLO 22



3	Sheets	CLO 22- CLO 25
4	Quizzes	CLO 22
5	Mid-term Exam	CLO 22
6	Final Exam	CLO 22- CLO 25

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

	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

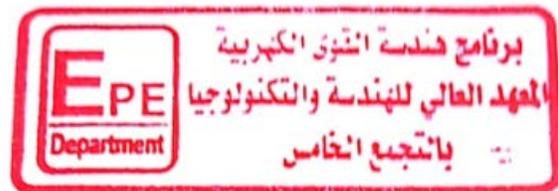
Week no#	Topics	Aim	LO's
1	Introduction to electrical measurements, errors	1	CLO25
2	Accuracy and precision.	1	CLO25
3	PMMCI construction and operation	1	CLO22,CLO25
4	DC ammeters, extension for range and Ayrton shunt.	1	CLO22,CLO25
5	DC voltmeters, & extension for range.	1	CLO22,CLO25
6 &7	Resistance measurements, Wheatstone bridge, & AC bridges	1	CLO22,CLO25
8	Sensors and transducers	1	CLO22,CLO25
10 & 11	Oscilloscopes	1	CLO22,CLO25
12& 13	AC measurements	1	CLO22,CLO25
14 & 15	Potentiometers and voltage measurements	1	CLO22,CLO25

10. Matrix of Program LOs with Course LOs

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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.	CLO25	Estimate the performance of various electrical quantities in the power systems.

Title	Name	Signature
Course coordinator	Dr. Dina Rostom	
Program coordinator	Dr. Hend Salama	
Head of Department	Ass. Prof. Dr. Osama El Ghandour	
Date of Approval	3/09/2023	





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Course Specification

Course Code: ECE 1211

Course Title: Electronic Engineering

46. Basic information

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

47. Course Aims

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

48. Learning Outcomes (LOs)

CLO.1	Identify Engineering fundamentals based on physical science.
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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.

49. 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
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



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Unipolar Junction transistor: DC biasing	14
Practical Exam	15

50. Teaching and Learning methods	
Course learning Outcome	Teaching and Learning Methods



s (LOs)	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
CLO.1	√			√		√						
CLO.3	√			√		√						√
CLO.22	√			√		√						√

51. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional tutorials	√

52. 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
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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	sheets	40%	40	5%	5
	Attendance			5%	5
	Simulation			10%	10
	Mid-term exam			20%	20
Final Exam		60%	60		60
Total			100		100

53. List of References

- [1] B. Razavi, "Fundamentals of Microelectronics," Los Angeles: Don Fowley, 2014.
 [2] T. L. Floyd, "Electronic devices: electron flow version", 9th edition ed., New Jersey: Prentice Hall, 2012.

54. Facilities required for teaching and learning

Lecture
 White board

55. 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	1	CLO.3, CLO.22
4	Diodes applications: Half wave circuits and power supply	1	CLO.3, CLO.22
5	Diodes applications: Clipper circuits	1	CLO.3, CLO.22
6	Diodes applications: Clampers	1	CLO.3, CLO.22
7	Diodes applications: Clampers and voltage doubler circuits.	1	CLO.3, CLO.22
8	Zener diodes and its applications.	1	CLO.3, CLO.22
9	Midterm		
10	Bipolar junction transistor: Physics	1	CLO.1
11	Bipolar junction transistor: DC Biasing configuration (1)	1	CLO.3, CLO.22
12	Bipolar junction transistor: DC Biasing configuration (2)	1	CLO.3, CLO.22
13	Unipolar Junction transistor: physics	1	CLO.1
14	Unipolar Junction transistor: DC biasing	1	CLO.3, CLO.22

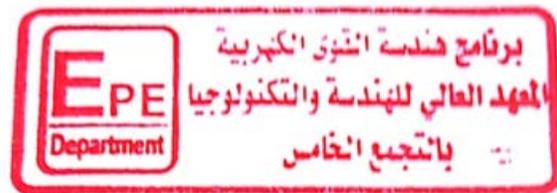
56. Matrix of Program LOs with Course Los

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
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	Ministry of Higher Education Higher Institute of Engineering and Technology Electrical Power Engineering Department	
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Course coordinator	Dr. Amira Nabil	Amira Nabil
Program coordinator	Dr. Hend Abd-Elmonem Salama	
Head of Department	Assoc. Prof. Dr. Osama ELghandour	
Date of Approval	3/09/2023	



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

57. Basic information	
Program Title	Electrical Engineering Department
Department offering the program	Electrical Engineering Department
Department offering the course	Civil Engineering Department
Course Code	CVE 1111
Year/level	First year / Second level (1 st Semester)
Specialization	Minor

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Teaching Hours	Lectures	Tutorial	Practical	Total
	3	2	0	5

58. Course Aims

No.	Aim
1	Design and conduct experiments as well as analyzing and interpreting data to work effectively within multi-disciplinary teams to pursue continuing education in highway engineering and self-learning. (AM2)

59. Learning Outcomes (LOs)

CLO4	Develop appropriate experimentation and/or simulation to draw conclusions.
CLO5	conduct appropriate experimentation and/or simulation to draw conclusions.
CLO12	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.

60. Course Contents

Topics	Week
Introduction to an indeterminate structures	1
Stability and Reactions of Structures.	2



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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

61. 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



CLO4	√			√								
CLO5	√			√		√						
CLO12	√			√		√						

62. Teaching and Learning methods of Disabled Students

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

63. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Attendance	CLO12
2	Sheets	CLO12
3	Quizzes	CLO4, CLO5
4	Mid-term Exam	CLO4, CLO5
5	Final Exam	CLO4, CLO5, CLO12

7.2 Assessment Schedule

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

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4	Mid-term Exam	9
5	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			10%	10
	Mid-term exam			20%	20
Final Exam		60%	60		
Total		100%	100		

64. 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.

65. 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

66. Matrix of Course Content with Course LO's

No.	Topics	Aim	Los
1	Introduction to an indeterminate structures	1	CLO4
2	Stability and Reactions of Structures.	1	CLO4, CLO5
3	Reactions	1	CLO4, CLO5
4	Internal Forces of Beams.	1	CLO4, CLO5
5	Internal Forces of Frames.	1	CLO4, CLO5
6	Internal Forces of Trusses.	1	CLO4, CLO5



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8	Introduction of surveying	1	CLO4
9	Mid-term exam	1	CLO4, CLO5, CLO12
10	Different kinds of scales	1	CLO4, CLO5, CLO12
11	Bearing and Angles computations	1	CLO4, CLO5
12	Example on the leveling	1	CLO4, CLO5, CLO12
13	Theodolite	1	CLO4, CLO5
14	Practical exam	1	CLO4, CLO5, CLO12
15	Final exam	1	CLO4, CLO5, CLO12

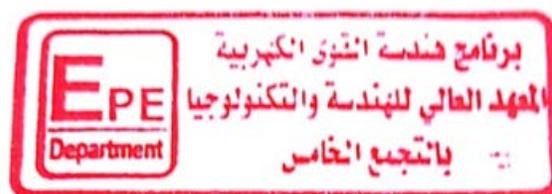
67. Matrix of Program LOs with Course Los

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.	CLO4	Develop appropriate experimentation and/or simulation to draw conclusions.
		CLO5	conduct appropriate experimentation and/or simulation to draw conclusions.
PLO7	Function efficiently as an individual and as a member of multi - disciplinary and multi-cultural teams.	CLO12	Function efficiently as an individual and as a member of multi-disciplinary and multi- cultural teams.

Title	Name	Signature
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	Ministry of Higher Education Higher Institute of Engineering and Technology Electrical Power Engineering Department	
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Course coordinator	Dr. Khale d Samy Aballah Dr. Nesrin Ali Morsy	Dr. Khale d Samy Dr. Nesrin Ali
Program Coordinator:	Dr. Hend Abd-Elmonem Salama	
Head of Department	Assoc.Prof. Dr. Osama ELghandour	
Date of Approval	3-9-2023	



Course Specification	
Course Code: CSE1211	Course Title: Computer Programing

68. Basic information	
Program Title	Electrical Power Engineering
Department offering the program	Electrical Power Engineering
Department offering the course	Computer Science Engineering Depart.
Course Code	CSE1211
Prerequisite	---



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Year/level	First year / Second Semester (2 nd Level)			
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	2		5

69. Course Aims

No.	Aim
1	Solve engineering problems, making use of Matlab (AM2).

70. 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.

71.

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
Solving engineering problems : Curve fitting and interpolation. Draw a stair surface.	10



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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
General course revision.	15

72. 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
CLO5	√			√	√	√						√
CLO14	√			√	√	√	√					√



73. Teaching and Learning methods of Disabled Students

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

74. 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

75. 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

76. Facilities required for teaching and learning

Lecture

White board

Data show

Laboratory Usage

77. Matrix of Course Content with Course LO's

Week 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. 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.	1	CLO.5, CLO.14
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



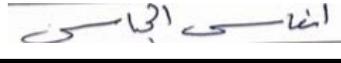
5	Data representation: Data representation as pie, bar. Draw polar coordinate plot for circle, cardioid, lemniscate, and rose curve. Draw 3D colored surfaces and contour.	1	CLO.5
6	Algorithms, flow charts, Input and output commands, Decision making (if-else) solving quadratic equation- student grade 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
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
15	General course revision.	1	CLO.5, CLO.14

78. Matrix of Program LOs with Course Los

Program Los	Course Los
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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	3/09/2023	

