



Course Specification

Course Code: PHM0101

Course Title: Mathematics (1)

1. Basic information

Program Title	Civil Engineering Depart.			
Department offering the program	Civil Engineering Depart.			
Department offering the course	Engineering Mathematics and Physics department			
Course Code	PHM0101			
Year/level	first year / (First Level)			
Specialization	Minor			
Teaching Hours	Lectures	Tutorial	Practical	Total
	4	2	0	6

2. Course Aims

No.	Aim
1	The purpose of this training is to provide students with the necessary skills to effectively apply the principles of Calculus and its various applications. This includes understanding and describing essential concepts such as Functions, Limits and continuity, Differentiation and integration, as well as their applications. Additionally, students will gain knowledge about Analytic Geometry and its practical applications, including equations for straight lines, ellipses, parabolas, hyperbolas, and circles. (AM2)

3. Course Learning Outcomes (CLOs)

Clo1	Identify and formulate complex engineering problems by applying engineering fundamentals, basic science, and mathematics.
Clo2	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics. by applying engineering fundamentals, basic science, and mathematics.

4. Course Contents

Topics	Week
Derivatives and techniques of differentiation- introduction of conics	1
Trigonometric functions: properties, derivatives - Parabola	2
Chain rule, implicit, parametric differentiation- Parabola	3
Extreme, points of inflection, asymptotes and curve fitting-Parabola.	4
Indefinite integral and change of variables., Topics of parabola	5
Definite integral, Ellipse	6
Logarithmic and exponential functions: properties, derivatives and integrals-Ellipse	7
Logarithmic and exponential functions: properties, derivatives and integrals- Hyperbola	8
Integral of Trigonometric functions- Hyperbola	10
Definite integral and its applications to area, volumes, arc length and surface- Rotation of axes.	11



Definite integral and its applications to area, volumes, arc length and surface-Planes.	12
L'Hopital Rule-Planes	13
L'Hopital Rule- straight line.	14
L'Hopital Rule- straight line.	15

5.		Teaching and Learning methods										
Course learning Outcomes (CLOs)	Teaching and Learning Methods											
	Lectures	Assignment	Labs	Research and Reports	Projects	Presentation	Site Visits	Discussion and Dialogue	Brain storm	E-Learning	Self-learning	Modeling and Simulation
Clo1	√		-	-	-	-	-			-	√	
Clo2	√	√	-	√	-	-	-	√	√	-	√	

6. Teaching and Learning methods of Disabled Students		
No.	Teaching Method	Reason
1	Additional Tutorials	X
2	Online lectures and assignments	x

7. Students' Assessment

7.1 Students' Assessment Method		
No.	Assessment Method	LOs
1	Attendance	-----
2	Reports	CLO2
3	Sheets	CLO2
4	quizzes	CLO2
5	Mid-term Exam	CLO2
6	Final Exam	CLO1, CLO2

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	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] I.A. Stegun & Milton Abramowitz, Handbook of Mathematical Functions: With Formulas, Graphs, and Mathematical Tables, Dover Publications Inc.; New edition 2022, ISBN-10 : 0486612724
- [2] Sarhan M. Musa ,Fundamentals of Technical Mathematics , - Publisher : Elsevier - CopyRight :2015 -ISBN : 9780128019870
- [3] Stewart. J, "Calculus", 6th Edition , 2008.
- [4]Hamdy M. Ahmed, Mathematics (1), 2019, ISBN 978-977-469-0445
- [5]George B. Thomas, Calculus, Edition, 2016
- [6]James Stewart., Calculus, Edition, 2011, ISBN007-124429-8

9. Facilities required for teaching and learning

Lecture/Classroom

White board

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

Data show

10. Matrix of Course Content with Course LO's

Week No.	Topics	Aim	LO's
1	Derivatives and techniques of differentiation- introduction of conics	1	CLO1
2	Trigonometric functions: properties, derivatives - Parabola	1	CLO1
3	Chain rule, implicit, parametric differentiation- Parabola	1	CLO2
4	Extreme, points of inflection, asymptotes and curve fitting-Parabola.	1	CLO2



5	Indefinite integral and change of variables., Topics of parabola	1	CLO1,CLO2
6	Definite integral, Ellipse	1	CLO1,CLO2
7	Logarithmic and exponential functions: properties, derivatives and integrals-Ellipse	1	CLO1,CLO2
8	Logarithmic and exponential functions: properties, derivatives and integrals- Hyperbola	1	CLO1,CLO2
10	Integral of Trigonometric functions- Hyperbola	1	CLO1,CLO2
11	Definite integral and its applications to area, volumes, arc length and surface- Rotation of axes.	1	CLO1,CLO2
12	Definite integral and its applications to area, volumes, arc length and surface- Planes.	1	CLO1,CLO2
13	L'Hopital Rule-Planes	1	CLO1,CLO2
14	L'Hopital Rule- straight line.	1	CLO2
15	L'Hopital Rule- straight line.	1	CLO2

11. Matrix of Program LOs with Course LOs

Program LOs		Course LOs	
Plo1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO 1	Identify and formulate complex engineering problems by applying engineering fundamentals, basic science, and mathematics.
		CLO 2	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.by applying engineering fundamentals, basic science, and mathematics.

Title	Name	Signature
Course coordinator	Dr. Eman Abdelaziz	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Asso. Prof. Dr. Sherif Ahmed Mohamed	
Date of Approval	1/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Course Specification	
Course Code: PHM0102	Course Title: Physics (1)

1. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Engineering Mathematics and Physics department			
Course Code	PHM0102			
Year/level	First Level/ (1 st Semester)			
Specialization	Minor			
Teaching Hours	Lectures	Tutorial	Practical	Total
	4	1	1	6

2. Course Aims	
No.	Aim
1	Training students to understand the properties of matter involves teaching them about units and dimensions, physical mechanics, potential energy gradient, circular motion, moment of inertia, elastic properties of materials, hydrostatics and surface tension, and hydrodynamics and viscosity. Additionally, students will learn about geometrical optics, including refraction of light, prisms, reflection of light, lenses, and lens aberration (AM2)

3. Course Learning Outcomes (CLOs)	
CLO1	Identify and formulate complex engineering problems by applying engineering fundamentals, basic science, and mathematics.
CLO2	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.by applying engineering fundamentals, basic science, and mathematics.
CLO4	Analyze and interpret data, assess by using statistical analyses to draw conclusions.
CLO5	Evaluate findings and use statistical analyses and objective engineering judgment.

4. Course Contents	
Topics	Week
Introduction, Units and dimension	1
Translational motion, Energy	2
Rotational motion	3
Moment of inertia	4
Elasticity of length, shape and volume	5
Energy stored in stretched wire , poisson ratio, Bulk module's	6
Absolute pressure, surface tension	7
Capillarity and applications of surface tension	8

7. Students' Assessment



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Civil Engineering Department



Viscosity	10
Bernoulli's equation and its applications	11
Bernoulli's equation and its applications	12
Types of lenses and image formed	13
Types of lenses, mirrors and image formed	14
Laboratory Exam	15

5.		Teaching and Learning methods											
Course learning Outcomes (CLOs)	Teaching and Learning Methods												
	Lectures	Assignment	Labs	Research and Reports	Projects	Presentation	Site Visits	Discussion and Dialogue	Brain storm	E-Learning	Self-learning	Modeling and Simulation	
CLO1	√	√	√	-	-	-	-	-	√	-	√	-	
CLO2	√	√	√	-	-	-	-	-	√	-	√	-	
CLO4	√	√	√	-	-	-	-	-	√	-	√	-	
CLO5	√	√	√	-	-	-	-	-	√	-	√	-	

6. Teaching and Learning methods of Disabled Students

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

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Attendance	CLO1, CLO2, CLO4, CLO5
2	Sheets	CLO1, CLO2, CLO4, CLO5
3	Quizzes	CLO1, CLO2, CLO4,
4	Mid-term Exam	CLO1, CLO2, CLO4,
5	Oral/ Practical Exam	CLO1, CLO2, CLO4, CLO5
6	Final Exam	CLO1, CLO2, CLO4, CLO5

7.2 Assessment Schedule

No.	Assessment Method	Weeks
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	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

1	Attendance	-
2	Sheets	Weekly
3	Quizzes	Bi-weekly
4	Mid-term Exam	9
5	Oral/ Practical Exam	15
6	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- Raymond A. Serway, John W. Jewett . Physics for Scientists and Engineers (MindTap Course List) 10th Edition, Cengage Learning; 10th edition (January 1, 2018), ISBN-10 : 1337553271
- 2- Karl F. Kuhn, Frank Noschese, Jossey-Bass; Basic Physics: A Self-Teaching Guide, 3rd Edition (Wiley Self-Teaching Guides) 3rd edition (September 16, 2020) ISBN-10 : 111962990X
- 1- Halliday, David, Fundamentals of physics / David Halliday, Robert Resnick, Jearl Walker.—9th ed., John Wiley & Sons Inc., New York, 2011.
- 2- Physics for Scientists and Engineers with Modern Physics, Ninth Edition
Raymond A. Serway and John W. Jewett, Jr. USA 2014.

9. Facilities required for teaching and learning

Lecture/Classroom
White board

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

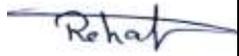
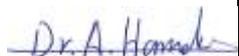
Lecture room equipped with e-learning tools (computer, mike,, etc.)
Data show

10. Matrix of Course Content with Course LO's		
Topics	Aim	CLO's
Introduction, Units and dimension	1	CLO1
Translational motion, Energy Labs: Practicing on measuring instruments (micrometer, and venire).	1	CLO1,CLO2
Rotational motion Labs: Practicing on measuring instruments (micrometer, and venire).	1	CLO1,CLO2
Moment of inertia Labs: Hooks Law	1	CLO1,CLO2
Elasticity of length, shape and volume Labs: Hooks Law	1	CLO2 ,CLO4
Energy stored in stretched wire , poisson ratio,Bulk modulu`s Labs: Archimedes Principle	1	CLO2 ,CLO4
Absolute pressure, surface tension Labs: Archimedes Principle	1	CLO2 ,CLO4
Capillarity and applications of surface tension Labs: Surface tension	1	CLO2, CLO4
Viscosity Labs: Surface tension	1	CLO2, CLO4
Bernoulli`s equation and its applications Labs: Lenses	1	CLO2, CLO4
Bernoulli`s equation and its applications Labs: Lenses	1	CLO2, CLO4
Types of lenses and image formed Labs: revision	1	CLO4,CLO5
Types of lenses, mirrors and image formed Labs: Rivision	1	CLO4,CLO5
Laboratory Exam	1	CLO1,CLO2 ,CLO4,CLO5

11. Matrix of Program LOs with Course LOs			
Program LOs		Course LOs	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO 1	Identify and formulate complex engineering problems by applying engineering fundamentals, basic science, and mathematics.
		CLO 2	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.by applying engineering fundamentals, basic science, and mathematics.

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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	analyze and interpret data, assess by using statistical analyses to draw conclusions.
		CLO5	evaluate findings and use statistical analyses and objective engineering judgment.

Title	Name	Signature
Course coordinator	Assoc. Prof. Rehab Ali	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Asso. Prof. Dr. Sherif Ahmed Mohamed	
Date of Approval	1/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Course Specification	
Course Code: PHM0103	Course Title: mechanics (1)

1. Basic information

Program Title	Civil Engineering Department.			
Department offering the program	Civil Engineering Department			
Department offering the course	Engineering Mathematics and Physics department			
Course Code	PHM0103			
Prerequisites	None			
Year/level	First year / level 1			
Specialization	Minor			
Teaching Hours	Lectures	Tutorial	Practical	Total
	2	2	0	4

2. Course Aims

No.	Aim
1	Providing students with academic skills to understand the principles of the mechanics and statics of particles, moments, Equilibrium equations and solve any problem in a simple and logical manner. (AM3)

3. Course Learning Outcomes (CLOs)

CLO1	Identify the principals of engineering mechanics, vectors, Forces and moments.
CLO2	Solve Equilibrium's equations of particles Rigid Bodies in two and three dimensions and frames

4. Course Contents

Topics	Week
General principles , fundamental concepts , units of Measurements	1
Scalars and vectors, vector operations, vector addition of forces	2
Position vectors, force vector directed along line, Dot product and cross product	3
Moment of a force (scalar formulation and vector formulation)	4
Moment of a couple, equivalent system, resultants of force and couple system	5



Equilibrium of a particle, condition for the equilibrium of a particle, the free body diagram.	6
Coplanar force systems	7
Three- dimensional force systems	8
Condition for of a rigid boy in two dimensions, free body diagrams, equations of equilibrium.	10
Equilibrium of a rigid body in three dimension, free body diagrams, equations of equilibriums.	11
Simple trusses	12
Frames and machines (part 1)	13
Frames and machines (part 2)	14
General revision	15

5.	Teaching and Learning methods											
	Teaching and Learning Methods											
	Lectures	Assignment	Labs	Research and Projects	Presentation	Site Visits	Discussion and Brain storm	E-Learning	Self-learning	Modeling and Simulation		
Course learning Outcomes (CLOs)												
CLO1	√	√	-	-	-	-	√	√	-	√		
CLO2	√	√	-	-	-	-	√	√	-	√		

6. Students' Assessment

6.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	CLO1
2	Written exam	CLO1, CLO2
3	Discussions	-
4	Mid Term Exam	CLO1, CLO2
5	Class works	CLO1, CLO2
6	Projects	-
7	Researches	-
8	Reports	-
9	Presentations	-
10	Quiz	CLO1, CLO2
11	Skiz	-

6.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Written exam	16
3	Discussions	-

4	Mid Term Exam	9
5	Class works	Bi-weekly
6	Projects	-
7	Researches	-
8	Reports	-
9	Presentations	-
10	Quiz	5 & 10
11	Skiz	-

7.3 Weighting of Assessments			
	Assessment Method	Weights%	Weights
Teacher Opinion	Class works	10%	10
	Attendance		
	Quiz	10%	10
	Mid-term exam	20%	20
Final Exam		60%	60
Total		100%	100

8. List of References

- [1] Russell Hibbeler, Engineering Mechanics: Dynamics 14th Edition, Pearson; 14th edition (March 31, 2015), ISBN-10 : 9780133915389
- [2] Merle Potter , E. Nelson, Charles Best & W. G. McLean, Schaum's Outline of Engineering Mechanics Dynamics, McGraw Hill; 7th edition (February 1, 2021), ISBN-10 : 1260462862
- [3] Engineering Mechanics: Statics (11th Edition) R.C. HIBBELER , 2008
- [4] Engineering Mechanics: Statics (13th Edition) R.C. HIBBELER , 2010

9. Facilities required for teaching and learning

Lecture/Classroom
White board
Lecture room equipped with e-learning tools (compute, mike, etc.)
data show

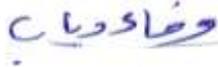
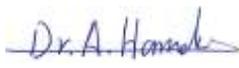
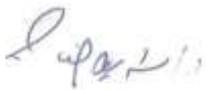
10. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	General principles , fundamental concepts , units of Measurements	1	CLO1
2	Scalars and vectors, vector operations, vector addition of forces	1	CLO1

3	Position vectors, force vector directed along line, Dot product and cross product	1	CLO1
4	Moment of a force (scalar formulation and vector formulation)	1	CLO1
5	Moment of a couple, equivalent system, resultants of force and couple system	1	CLO1
6	Equilibrium of a particle, condition for the equilibrium of a particle, the free body diagram.	1	CLO1, CLO2
7	Coplanar force systems	1	CLO2
8	Three- dimensional force systems.	1	CLO2
10	Condition for of a rigid boy in two dimensions, free body diagrams, equations of equilibrium..	1	CLO2
11	Equilibrium of a rigid body in three dimension, free body diagrams, equations of equilibriums.	1	CLO2
12	Simple trusses	1	CLO2
13	Frames and machines (part 1)	1	CLO2
14	Frames and machines (part 2)	1	CLO1, CLO2
15	General revision	1	CLO1, CLO2

11. Matrix of Program LOs with Course Los

Program LOs		Course Los	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO 1	Identify the principals of engineering mechanics, vectors, Forces and moments.
		CLO 2	Solve Equilibrium's equations of particles Rigid Bodies in two and three dimensions and frames

Title	Name	Signature
Course coordinator	Asso. Prof. Walaa Elnashar	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Asso. Prof. Dr. Sherif Ahmed Mohamed	
Date of Approval	1/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Eng. Department	

Course Specification	
Course Code: MCE 0101	Course Title: Engineering drawing (1)

1. Basic information				
Program Title	Civil Engineering Depart.			
Department offering the program	Civil Engineering Depart.			
Department offering the course	Engineering Mathematics and Physics department			
Course Code	MCE 0101			
Prerequisites	None			
Year/level	Prep. Year / First Level			
Specialization	Minor			
Teaching Hours	Lectures	Tutorial	Practical	Total
	2	4	0	6

2. Course Aims	
No.	Aim
1	Providing students with the basic, knowledge and skills of engineering drawing concepts and principles, as well as fundamentals of drawing projections. The course also covers the basic principles of drawing with various applications. Students will learn to work efficiently by using data analysis and objective engineering judgment (AM3)

3. Learning Outcomes (CLOs)	
CLO 1	Identify and formulate complex engineering problems by applying engineering fundamentals, basic science, and mathematics.
CLO 2	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.by applying engineering fundamentals, basic science, and mathematics.
CLO16	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.
CLO17	Use creative, innovative, and flexible thinking to respond to new situations.

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	Civil Eng. Department	

4. Course Contents	
Topics	Week
Introduction of principles of engineering lines used in drawing.	1
Geometric construction theories of view derivation	2
Orthographic projection of engineering bodies.	3
Orthographic projection of engineering bodies.	4
Projection of point, lines, surfaces, and bodies.	5
How to divide of engineering drawing board and general engineering drawing	6
Drawing engineering operations and some application on it.	7
Drawing engineering operations and some application on it.	8
Drawing of simple isometrics and its projections.	10
Drawing of simple isometrics and its projections.	11
Drawing of complicated isometrics with inclined surfaces.	12
Drawing of complicated isometrics with inclined surfaces.	13
Drawing of the third projection with the knowledge of the other projectors.	14
Drawing of the third projection with the knowledge of the other projectors.	15

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Eng. Department	

5. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Lectures	Assignment	Labs	Research and Reports	Projects	Presentation	Site Visits	Discussion and Dialogue	Brain storm	E-Learning	Self-learning	Modeling and Simulation
CLO 1	√											
CLO 2	√	√		√				√				
CLO13	√	√		√				√				
CLO14	√	√		√				√				

7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	Clo2, Clo16, Clo17
2	Reports	Clo2, Clo16, Clo17
3	Quizzes	-----
4	Mid-term Exam	Clo1, Clo2, Clo16, Clo17
5	Final Exam	Clo1, Clo2, Clo16, Clo17

7.2 Assessment Schedule

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

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Eng. Department	

Teacher Opinion	Reports	10%	10
	Attendance	10%	10
	Mid-term exam	20%	20
Final Exam		60%	60
Total		100%	100

7.3 Weighting of Assessments					
	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets / Activities	%40	60	20%	30
	Attendance			6.67%	10
	Quizzes			-	-
	Mid-term exam			%13.33	20
Final Exam	Written exam	%60	90	%60	90
Total		%100	150	%100	150

8. List of References

- [1] K. L. Narayana, P. Kannaiah, and K. Venkata Reddy ' Machine Drawing' New Age International (P) Ltd., 2006.
- [2] C. Simmons, D. Maguive, and N. Phelps, 'Manual of Engineering Drawing', Elsevier Ltd., 2009.
- [3] N. D. Bhatt, Engineering Drawing, Charotar Publiction; 54th Edition 2022, ISBN-10 : 9385039709
- [4] R K DHAWAN, A Text Book of Engineering Drawing: Geometrical Drawing 3rd Rev. Edition 2006, Published by S Chand; ASIN : B00QUYKXI

9. Facilities required for teaching and learning

Lecture
White board
Classroom

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Eng. Department	

10. Matrix of Course Content with Course LO's

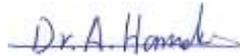
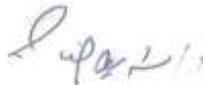
No.	Topics	Aim	LO's
1	Introduction of principles of engineering lines used in drawing.	1	Clo1, Clo2
2	Geometric construction theories of view derivation	1	Clo1, Clo2, Clo17
3	Orthographic projection of engineering bodies.	1	Clo1, Clo16.
4	Orthographic projection of engineering bodies.	1	Clo1, Clo16, Clo17
5	Projection of point, lines, surfaces, and bodies.	1	Clo1, Clo16
6	How to divide of engineering drawing board and general engineering drawing	1	Clo1, Clo17
7	Drawing engineering operations and some application on it.		Clo16, Clo17
8	Drawing engineering operations and some application on it.	1	Clo16, Clo17
10	Drawing of simple isometrics and its projections.	1	Clo16, Clo17
11	Drawing of simple isometrics and its projections.	1	Clo16, Clo17
12	Drawing of complicated isometrics with inclined surfaces.	1	Clo1, Clo2, Clo16, Clo17
13	Drawing of complicated isometrics with inclined surfaces.	1	Clo16, Clo17
14	Drawing of the third projection with the knowledge of the other projectors. Tutorials: Mid term	1	Clo16, Clo17
15	Drawing of the third projection with the knowledge of the other projectors.	1	Clo1, Clo2, Clo16, Clo17

10. Matrix of Program LOs with Course LOs

Program LOs		Course LOs	
Plo1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO 1	Identify and formulate complex engineering problems by applying engineering fundamentals, basic science, and mathematics.
		CLO 2	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics. by applying engineering fundamentals, basic science, and mathematics.

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Plo8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	CLO16	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.
Plo9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	CLO17	Use creative, innovative, and flexible thinking to respond to new situations.

Title	Name	Signature
Course coordinator	Dr / Mohamed Abdelrahman	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Asso. Prof. Dr. Sherif Ahmed Mohamed	
Date of Approval	1/10/2022	

	Ministry of Higher Education	
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	Civil Engineering Department	

Course Specification	
Course Code: CSE0101	Course Title: Computer skills

1. Basic information

Program Title	Civil Engineering Depart.			
Department offering the program	Civil Engineering Depart.			
Department offering the course	Communication and Electronics Engineering Depart.			
Course Code	CSE0101			
Year/level	Prep. Year / First Level			
Specialization	Minor			
Teaching Hours	Lectures	Tutorial	Practical	Total
	2	1	-	3

2. Course Aims

No.	Aim
1	Work efficiently to Understand Hardware components of computer, data representation in computer, network classifications. Understand the fundamental programming and write programs using C language, find the output of any C programs, correct the errors, and draw their flow chart (AM1).

3. Course Learning Outcomes (CLOs)

CLO 2	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics. by applying engineering fundamentals, basic science, and mathematics.
CLO16	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.

4. Course Contents

Topics	Week
Computer hardware: Types of Computers, Central Processing Unit, Arithmetic and logic unit, and Control unit.	1
Computer hardware: Input devices- output devices.	2
Computer hardware: Memory types- Registers.	3

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Number systems: Decimal- Binary- Octal -Hexadecimal numbers. Conversion from any number system to any number system. Addition in binary system	4
Number systems: Negative numbers in binary system one's and two's complement – sign magnitude. Subtraction in binary system	5
Introduction to C programming language: Variable types, Write an equation, Input and output commands, and flow charts.	6
C programming language: Decision making (if-else rule)	7
C programming language: Loops (for - while rules), and nested loops	8
C programming language: Write different programs	10
C programming language: Find and correct the errors in a program. Find the output of any program.	11
Introduction to network: Network classifications according to the network media, architecture, size and topology.	12
Multimedia: (images – videos -audio)	13-14
Practical Exam	15

5. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Lectures	Assignment	Labs	Research and Reports	Projects	Presentation	Site Visits	Discussion and Dialogue	Brain storm	E-Learning	Self-learning	Modeling and Simulation
CLO 2	√	√						√	√			
CLO16	√	√	√	√				√	√			

6. Students' Assessment

6.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Reports	CLO16
2	Quizzes	CLO2
3	Midterm exam	CLO2, CLO16
4	Oral exam	CLO16
5	Written exam	CLO2, CLO16

6.2 Assessment Schedule

No.	Assessment Method	Weeks
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1	Attendance	
2	Reports	5,6,12
3	Quizzes	4
4	Mid-term Exam	9
5	Oral Exam	15
6	Written exam	16

6.3 Weighting of Assessments					
	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets / Activities	40%	40	5%	5
	Attendance				
	Quiz 1 / Quiz 2			%5	5
	Mid-term exam			%20	20
	Oral exam			%10	10
Final Exam		60%	60	60%	60
Total		100	100	100	100

7. List of References
[1] Logic & Computer Design Fundamentals by M. Morris Mano, Charles Kime, et al. Mar 4, 2015
[2] Mike McGrath, "C Programming in easy steps", 4th edition, 2012
[3] Darrell Hajek & Cesar Herrera. Introduction to Computers, Independently published (May 19, 2022), ISBN-13 : 979-8830413732
[4] Kevin Wilson, Computer Fundamentals: The Step-by-step Guide to Understanding Computers, Independently published (August 1, 2021), ISBN-13 : 979-8545912032

8. Facilities required for teaching and learning
Lecture
White board
Data show
Classroom
Laboratory Usage

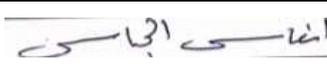
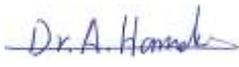
9. Matrix of Course Content with Course LO's

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Topics	Aim	LO's
Computer hardware: Types of Computers, Central Processing Unit, Arithmetic and logic unit, and Control unit.	1	CLO2
Computer hardware: Input devices- output devices.	1	CLO2
Computer hardware: Memory types- Registers.	1	CLO2
Number systems: Decimal- Binary- Octal -Hexadecimal numbers. Conversion from any number system to any number system. Addition in binary system	1	CLO2
Number systems: Negative numbers in binary system one's and two's complement – sign magnitude. Subtraction in binary system	1	CLO2
Introduction to C programming language: Variable types, Write an equation, Input and output commands, and flow charts.	1	CLO2,CLO16
C programming language: Decision making (if-else rule)	1	CLO2,CLO16
C programming language: Loops (for - while rules), and nested loops	1	CLO2,CLO16
C programming language: Write different programs	1	CLO2,CLO16
C programming language: Find and correct the errors in a program. Find the output of any program.	1	CLO2,CLO16
Introduction to network: Network classifications according to the network media, architecture, size and topology.	1	CLO2,CLO16
Multimedia: (images – videos -audio)	1	CLO2
Practical Exam	1	CLO16

10. Matrix of Program LOs with Course LOs			
Program LOs		Course LOs	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO 2	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.by applying engineering fundamentals, basic science, and mathematics.
PLO8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	CLO16	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.

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Title	Name	Signature
Course coordinator	Dr. Enas Mahmoud Elgbbas	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Asso. Prof. Dr. Sherif Ahmed Mohamed	
Date of Approval	1/10/2022	

	Ministry of Higher Education	
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	Civil Engineering Department	

Course Specification	
Course Code: HUM0101	Course Title: Technical Language

1. Basic information

Program Title	Civil Engineering Depart.			
Department offering the program	Civil Engineering Depart.			
Department offering the course	Engineering Mathematics and Physics department			
Course Code	HUM0101			
Prerequisites	None			
Year/level	Prep. Year / First Level			
Specialization	Minor			
Teaching Hours	Lectures	Tutorial	Practical	Total
	2	0	0	2

2. Course Aims

No.	Aim
1	The training program is designed to enhance students'-critical thinking, writing, and English grammar skills. Additionally, it emphasizes the correct formatting of numbers, equations, symbols, and various technical documents such as reports, proposals, letters, and presentations. (AM2)

3. Course Learning Outcomes (CLOs)	
CLO15	Function efficiently as an individual and as a member of multi-disciplinary and multi- cultural teams.
CLO16	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.

4. Course Contents

Topics	Week
Review of English Grammar and Mechanics of Language (Capitalization – Punctuation)	1
Review of English Grammar and Mechanics of Language (Capitalization – Punctuation)	2

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Some characteristics of Technical Language (Abbreviation)	3
How to write numbers, units, equations, symbols, and units of measure	4
How to write numbers, units, equations, symbols, and units of measure	5
Technical words problems: such as jargons, Big words, Wordy phrases, Redundancies, Clichés, Nouns as adjectives, and Misused and troublesome words and phrases	6
Technical words problems: such as jargons, Big words, Wordy phrases, Redundancies, Clichés, Nouns as adjectives, and Misused and troublesome words and phrases	7
Technical words problems: such as jargons, Big words, Wordy phrases, Redundancies, Clichés, Nouns as adjectives, and Misused and troublesome words and phrases	8
Rules and Principals of technical writing	10
Rules and Principals of technical writing	11
Good technical writing	12
Good technical writing	13
Applications of technical writing <ul style="list-style-type: none"> • Letters • reports • manuals • proposals • presentations 	14
Applications of technical writing <ul style="list-style-type: none"> • Letters • reports • manuals • proposals • presentations 	15

5. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Lectures	Assignment	Labs	Research and Reports	Projects	Presentation	Site Visits	Discussion and Dialogue	Brain storm	E-Learning	Self-learning	Modeling and

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CLO15	√			√		√		√	√		√	
CLO16	√			√				√	√		√	

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,CLO16
2	Reports	CLO15, CLO16
3	Quiz	-
4	Mid-term Exam	-
6	Written Exam	CLO15, CLO16

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports	Bi-weekly
3	Quiz	-
4	Mid-term Exam	9
5	Written Exam	16

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights
Teacher Opinion	Reports	20%	20
	Attendance	10%	10
	sheets	10%	10
Final Exam		60%	60
Total		100%	100

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

8. List of References

- [1]- D. J. Weatherford, “Technical Writing in Engineering Professions“, 2016.
 [2] - Phillip A. Laplante, “Technical Writing: A Practical Guide for Engineers and Scientists”, CRC Press, 2nd edition, July 2018.
 [3]- Stephen Howe, Concise PhraseBook for Writing Academic English, Whole World Company Press (October 1, 2022), ISBN-10 : 1903384095
 [4]- Mark Ibbotson, Cambridge English for Engineering Student's Book with Audio CDs (2) (Cambridge English For Series) Student Edition, Cambridge University Press; New Student edition 2020, ISBN-10 : 0521715180

9. Facilities required for teaching and learning

Lecture

White board

Classroom

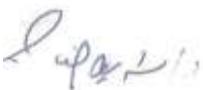
10. Matrix of Course Content with Course LO's

Topics	Aim	LO's
Review of English Grammar and Mechanics of Language (Capitalization –Punctuation)	1	CLO15, CLO16
Review of English Grammar and Mechanics of Language (Capitalization –Punctuation)	1	CLO15, CLO16
Some characteristics of Technical Language (Abbreviation)	1	CLO15, CLO16
How to write numbers, units, equations, symbols, and units of measure	1	CLO15, CLO16
How to write numbers, units, equations, symbols, and units of measure	1	CLO15, CLO16
Technical words problems: such as jargons, Big words, Wordy phrases, Redundancies, Clichés, Nouns as adjectives, and Misused and troublesome words and phrases	1	CLO15, CLO16
Technical words problems: such as jargons, Big words, Wordy phrases, Redundancies, Clichés, Nouns as adjectives, and Misused and troublesome words and phrases	1	CLO15, CLO16
Technical words problems: such as jargons, Big words, Wordy phrases, Redundancies, Clichés, Nouns as adjectives, and Misused and troublesome words and phrases	1	CLO15, CLO16
Mid term		CLO15, CLO16
Rules and Principals of technical writing	1	CLO15, CLO16
Rules and Principals of technical writing	1	CLO15, CLO16
Good technical writing	1	CLO15, CLO16
Good technical writing	1	CLO15, CLO16

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Applications of technical writing <ul style="list-style-type: none"> • Letters • reports • manuals • proposals presentations	1	CLO15, CLO16
Applications of technical writing <ul style="list-style-type: none"> • Letters • reports • manuals • proposals presentations	1	CLO15,CLO16

11. Matrix of Program LOs with Course LOs			
Program LOs		Course LOs	
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.
PLO8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	CLO16	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.

Title	Name	Signature
Course coordinator	Dr. Mona Naeem	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Asso. Prof. Dr. Sherif Ahmed Mohamed	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Date of Approval	1/10/2022	
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	Civil Engineering Department	

Course Specification

Course Code: PHM0201

Course Title: Mathematics (2)

1. Basic information

Program Title	Civil Engineering Depart.			
Department offering the program	Civil Engineering Depart.			
Department offering the course	Engineering Mathematics and Physics department			
Course Code	PHM0201			
prerequisite	none			
Year/level	Prep year / (First Level)			
Specialization	Minor			
Teaching Hours	Lectures	Tutorial	Practical	Total
	4	2	0	6

2. Course Aims

No.	Aim
1	Train students to practice the methodology of thinking and describing concepts of hyperbolic and inverse functions, derivatives, and identifying all techniques of integration. Additionally, teach students the algebra of matrices, solving linear systems, the theory of equations, and the algebra of infinite series. (AM2)

3. Course Learning Outcomes (CLOs)

CLO 3	Develop appropriate and identify all techniques of integration, Matrices, theory of equations and infinite series
CLO 4	conduct appropriate by using all techniques of integration, Matrices, theory of equations and infinite series
CLO5	Evaluate findings and use statistical analyses and objective engineering judgment

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4 Course Contents

Topics	Week
Introduction Hyperbolic and inverse functions and their properties-Matrices and their types.	1
Derivative of hyperbolic and inverse functions-Inverse of matrix	2
Integration of hyperbolic and inverse functions	3
Linear systems and types of solutions.	4
Integration by the method of substitution of trigonometric-Properties of Eigenvalues and eigenvectors of matrices method of solve it.	5
Integration by the method of partial fractions. Properties of Eigenvalues and eigenvectors of matrices method of solve it.	6
Properties of Eigenvalues and eigenvectors of matrices method of solve it.	7
Integration by the method of Parts- Theory of equations.	8
Integration by the method of Parts- Theory of equations.	10
Applications of the definite integral - Theory of equations.	11
Integration by reduction-infinite series	12
Integration by reduction- infinite series	13
Wails' formula- infinite series	14
Revision	15

5. Teaching and Learning methods

Course learning Outcomes (CLOs)	Teaching and Learning Methods											
	Lectures	Assignment	Labs	Research and Reports	Projects	Presentation	Site Visits	Discussion and Dialogue	Brain storm	E-Learning	Self-learning	Modeling and
CLO 3	√
CLO 4	√	√	.	√	.	.	.	√	.	.	√	.
CLO 5	√	√	.	√	.	.	.	√	.	.	√	.

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	Civil Engineering Department	

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	CLO3,CLO5
2	Reports	CLO4,CLO5
3	Sheets	CLO4,CLO5
4	Quizzes	CLO4,CLO5
5	Mid-term Exam	CLO4,CLO5
6	Final Exam	CLO3,CLO4,CLO5

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	10%	15
	Attendance	3.33%	5
	Quizzes	10%	15
	Mid-term exam	26.6%	40
Final Exam		50%	75

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Total		100%	150
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8. List of References

- [1] Stewart. J, "Calculus", 6th Edition , 2008.
 [2]Hamdy M. Ahmed, Mathematics (1), 2019, ISBN 978-977-469-0445
 [3]George B. Thomas, Calculus, 3rd Edition, 2016
 [4]James Stewart., Calculus, 4th Edition, 2011, ISBN007-124429-8

9. Facilities required for teaching and learning

Lecture/Classroom

White board

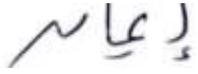
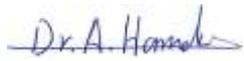
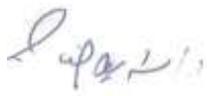
10. Matrix of Course Content with CourseC LO's

Topics	Aim	CLO's
Introduction Hyperbolic and inverse functions and their properties-Matrices and their types.	1	CLO3
Derivative of hyperbolic and inverse functions-Inverse of matrix	1	CLO3,CLO4,CLO5
Integration of hyperbolic and inverse functions	1	CLO3,CLO4,CLO5
Linear systems and types of solutions.	1	CLO3,CLO4,CLO5
Integration by the method of substitution of trigonometric-Properties of Eigenvalues and eigenvectors of matrices method of solve it.	1	CLO3,CLO4,CLO5
Integration by the method of partial fractions. Properties of Eigenvalues and eigenvectors of matrices method of solve it.	1	CLO3,CLO4,CLO5
Properties of Eigenvalues and eigenvectors of matrices method of solve it.	1	CLO3,CLO4,CLO5
Integration by the method of Parts- Theory of equations.	1	CLO3,CLO4,CLO5
Integration by the method of Parts- Theory of equations.	1	CLO3,CLO4,CLO5
Applications of the definite integral - Theory of equations.	1	CLO3,CLO4,CLO5
Integration by reduction-infinite series	1	CLO3,CLO4,CLO5
Integration by reduction- infinite series	1	CLO3,CLO4,CLO5
Wails' formula- infinite series	1	CLO3,CLO4,CLO5
Revision	1	CLO3,CLO4,CLO5

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11. Matrix of Program PLOs with Course CLOs

Program PLOs		Course CLOs	
Plo2	Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	CLO 3	Develop and conduct appropriate experimentation and/or simulation to draw conclusions.
		CLO 4	analyze and interpret data, assess by using statistical analyses to draw conclusions.
		CLO5	Evaluate findings and use statistical analyses and objective engineering judgment

Title	Name	Signature
Course coordinator	Dr. Eman Abdelaziz	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Asso. Prof. Dr. Sherif Ahmed Mohamed	
Date of Approval	1/10/2022	

	Ministry of Higher Education	
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Course Specification Course Code: PHM0202 Course Title: Physics (2)

1. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Engineering Mathematics and Physics department			
Course Code	PHM0202			
Year/level	Prep year / (first level)			
Specialization	Minor			
Teaching Hours	Lectures	Tutorial	Practical	Total
	4	1	1	6

2. Course Aims	
No.	Aim
1	Training students to describe electricity: Vectors, electric field, electric potential, capacitors and dielectrics. Electromagnetism: Magnetic field, magnetic force, Biot-Savart law, Ampere's law, electromagnetic induction, alternating current. Heat and thermodynamics: Heat transfer, kinetic theory of gases, first law of thermodynamics. (AM2)

3. Course Learning Outcomes (CLOs)	
CLO1	Identify and formulate complex engineering problems by applying engineering fundamentals, basic science, and mathematics.
CLO2	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics. by applying engineering fundamentals, basic science, and mathematics.
CLO5	evaluate findings and use statistical analyses and objective engineering judgment.

4. Course Contents	
Topics	Week
Coulombs Law	1

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Potential difference	2
Electric current	3
Capacitors	4
Magnetic Field	5
Inductance	6
Alternating current	7
RLC Circuit	8
Temperature measurement and Specific Heat.	10
Heat transfer and Properties of gases and Vapors	11
Thermodynamics	12
Heat Engines	13
Entropy	14
Laboratory Exam	15

5. Teaching and Learning methods

Course learning Outcomes (CLOs)	Teaching and Learning Methods											
	Lectures	Assignment	Labs	Research and Reports	Projects	Presentation	Site Visits	Discussion and Dialogue	Brain storm	E-Learning	Self-learning	Modeling and Simulation
CLO1	√		√		-		-		√	-	-	-
CLO2	√	√	√									
CLO5	√	√	√		-		-		√	-	-	-

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

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No.	Assessment Method	Los
1	Attendance	CLO1, CLO2, CLO4, CLO5
2	Sheets	CLO1, CLO2, CLO4, CLO5
3	Quizzes	CLO1
4	Mid-term Exam	CLO1, CLO2,
5	Oral/ Practical Exam	CLO1,CLO2,CLO5
6	Final Exam	CLO1,CLO2,CLO5

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-Halliday, David, Fundamentals of physics / David Halliday, Robert Resnick, Jearl Walker, 9th ed., John Wiley & Sons Inc., New York, 2011.
- 2- Physics for Scientists and Engineers with Modern Physics, Ninth Edition, Raymond A. Serway and John W. Jewett, Jr. USA, 2014.
- 3- Jim Al-Khalili, " The Physics Book: Big Ideas Simply Explained", DK Publisher, 2020, ISBN: 978-0241412725

9. Facilities required for teaching and learning

	Ministry of Higher Education	
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	Civil Engineering Department	

Lecture/Classroom
White board
Data Show

10. Matrix of Course Content with Course LO's		
Topics	Aim	CLO's
Coulombs Law Labs: Introduction	1	CLO1
Potential difference Labs: Introduction	1	CLO1,CLO2.
Electric current Labs: whetstone Bridge	1	CLO1,CLO2
Capacitors Labs: whetstone Bridge	1	CLO2,CLO5
Magnetic Field Labs: Ohms Law	1	CLO2,CLO5
Inductance Labs: Ohms Law	1	CLO2,CLO5
Alternating current Labs: RLC(inductor)	1	CLO1,CLO2, CLO5
RLc Circuit Labs: RLC(Inductor)	1	CLO1,CLO2, CLO5
Temperature measurement and Specific Heat. Labs: RLC(capacitor)	1	CLO1, CLO5
Heat transfer and Properties of gases and Vapors Labs: RLC(capacitor)	1	CLO2,CLO5
Thermodynamics Labs: Thermocouple	1	CLO2,CLO5
Heat Engines Labs: Thermocouple	1	CLO2,CLO5
Entropy Labs: Revision	1	CLO2,CLO5
Laboratory Exam	1	CLO1,CLO2, CLO5

11. Matrix of Program LOs with Course LOs			
Program LOs		Course LOs	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science,	CLO1	Identify and formulate complex engineering problems by applying engineering fundamentals, basic science, and mathematics.



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	and mathematics.	CLO2	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics. by applying engineering fundamentals, basic science, and mathematics.
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.	CLO5	evaluate findings and use statistical analyses and objective engineering judgment.

Title	Name	Signature
Course coordinator	Ass.Prof. Dr. Rehab Ali Ass.Prof.Dr. Ahmed Abdelbary Dr.Eman Abdelaziz	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Asso. Prof. Dr. Sherif Ahmed Mohamed	
Date of Approval	1/10/2022	

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Course Specification	
Course Code: PHM 0203	Course Title: mechanics (2)

1. Basic information				
Program Title	Civil Engineering Department.			
Department offering the program	Civil Engineering Department.			
Department offering the course	Engineering Mathematics and Physics department			
Course Code	PHM 0203			
Year/level	Prep year / First Level			
Specialization	Minor			
Teaching Hours	Lectures	Tutorial	Practical	Total
	2	2	0	4

2. Course Aims	
No.	Aim
1	Providing students with academic skills to identify the principles of dynamics, Rectilinear and Curvilinear motion, the Linear momentum, Angular momentum of particles, and solve any problem in a simple and logical manner. (AM3)

1. Course Learning Outcomes (CLOs)	
CLO1	Identify the Rectilinear and the Curvilinear motion of particles (Position, Velocity, and acceleration) and the equations of motion.
CLO2	Solve the equations of motion in different coordinates, the Projectiles problems and the Loss of Kinetic Energy during the Impact of two objects.
CLO3	Develop the definition of Linear Momentum of particles, rate of change of Linear Momentum.

2. Course Contents	
Topics	Week

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<ul style="list-style-type: none"> - Kinematics of particles. - Rectilinear motion of particles (Position, Velocity and acceleration) - two dimension. 	1
<ul style="list-style-type: none"> - Rectilinear motion of particles (Position, Velocity and acceleration) - three dimension. 	2
<ul style="list-style-type: none"> - Curvilinear motion: cylindrical coordinates 	3
<ul style="list-style-type: none"> - Curvilinear motion: normal and tangential (intrinsic) coordinates 	4
<ul style="list-style-type: none"> - Motion of a projectile 	5
<ul style="list-style-type: none"> - relative motion 	6
<ul style="list-style-type: none"> - Kinetics of particles. (Force and acceleration) - Newton’s Second law of motion. - Equations of motion : rectangular coordinates 	7
Equations of motion : normal and tangential coordinates	8
Equations of motion : cylindrical coordinates	10
<ul style="list-style-type: none"> - Kinetics of particles: work and energy - The work of a force - Principle of work and energy 	11
<ul style="list-style-type: none"> - Power and efficiency - Conservative force and potential energy 	12
<ul style="list-style-type: none"> - Conservation of energy 	13
Kinetics of particles: <ul style="list-style-type: none"> - Principle of linear impulse and momentum - Conservation of linear momentum for a system of particles 	14
<ul style="list-style-type: none"> - Impact 	15

3. Teaching and Learning methods

Course learning Outcomes (CLOs)	Teaching and Learning Methods											
	Lectures	Assignment	Labs	Research and Reports	Projects	Presentation	Site Visits	Discussion and Dialogue	Brain storm	E-Learning	Self-learning	Modeling and Simulation

Clo1	√	-	-	-	-	-	-	√	√	-	-	-
Clo2	-	√	-	-	-	-	-	√	-	-	-	-
Clo3	√	√	-	-	-	-	-	-	√	-	-	-

4. Students' Assessment

6.1 Students' Assessment Method

No.	Assessment Method	Clos
1	Attendance	Clo1, Clo3
2	Written exam	Clo1, Clo2, Clo3
3	Discussions	Clo1, Clo2, Clo3
4	Mid Term Exam	Clo1, Clo3
5	Class works	Clo1, Clo3
6	Projects	-
7	Researches	-
8	Reports	-
9	Presentations	-
10	Quiz	Clo1, Clo2, Clo3
11	Skiz	-

6.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Written exam	16
3	Discussions	Weekly
4	Mid Term Exam	9
5	Class works	Bi-weekly
6	Projects	-
7	Researches	-
8	Reports	-
9	Presentations	-
10	Quiz	5 & 10
11	Skiz	-

6.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Discussions	40	40	2	2
	Class works			8	8
	Quiz			10	10

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	Mid-term exam			20	20
Final Exam	Written exam	60	60	60	60
Total		100	100	100	100

5. List of References

- [1] James, Meriam , L. G. Kraige , "Engineering Mechanics: Dynamics", (8th SI Version Edition), John Wiley & Sons, 2016, ISBN-10 : 1119044812
- [2] D.S. Kumar, " Engineering Mechanics (Statics & Dynamics)", S.K.Kataria and son, 2019, ISBN:9789350142929
- [3] Ferdinand P. Beer and E. Russell Johnston, Jr., "Vector Mechanics for Engineers: Dynamics", Edition adapted by McGraw Hill, New York, 2018, ISBN 10 1259977307

6. Facilities required for teaching and learning

Lecture/Classroom

White board

Data show

8. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	- Kinematics of particles. - Rectilinear motion of particles (Position, Velocity and acceleration) - two dimension.	1	CLO1
2	- Rectilinear motion of particles (Position, Velocity and acceleration) - three dimension.	1	CLO1
3	- Curvilinear motion: cylindrical coordinates	1	CLO1
4	- Curvilinear motion: normal and tangential (intrinsic) coordinates	1	CLO1
5	- Motion of a projectile	1	CLO1
6	- relative motion	1	CLO1, CLO2
7	- Kinetics of particles. (Force and acceleration) - Newton's Second law of motion.	1	CLO1, CLO2

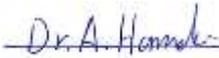
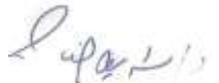
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	- Equations of motion : rectangular coordinates		
8	Equations of motion : normal and tangential coordinates	1	CLO1, CLO2
10	Equations of motion : cylindrical coordinates	1	CLO1, CLO2
11	- Kinetics of particles: work and energy - The work of a force - Principle of work and energy	1	CLO2
12	- Power and efficiency - Conservative force and potential energy	1	CLO2
13	- Conservation of energy	1	CLO1, CLO2
14	Kinetics of particles: - Principle of linear impulse and momentum - Conservation of linear momentum for a system of particles	1	CLO3
15	- Impact	1	CLO1, CLO3

7. Matrix of Program LOs with Course Los

Program LOs		Course Los	
Plo1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	Clo1	Identify the Rectilinear and the Curvilinear motion of particles (Position, Velocity, and acceleration) and the equations of motion.
		Clo2	Solve the equations of motion in different coordinates, the Projectiles problems and the Loss of Kinetic Energy during the Impact of two objects.
Plo2	Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions	Clo3	Develop the definition of Linear Momentum of particles, rate of change of Linear Momentum.

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Title	Name	Signature
Course coordinator	Dr. Wafaa Diab	
Program coordinator	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Asso. Prof. Dr. Sherif Ahmed Mohamed	
Date of Approval	1/10/2022	

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Course Specification	
Course Code: PHM0204	Course Title: Chemistry

1. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Engineering Mathematics and Physics department			
Course Code	PHM0204			
Prerequisite	None			
Year/level	Prep year / (First level)			
Specialization	Minor			
Teaching Hours	Lectures	Tutorial	Practical	Total
	4	1	1	6

2. Course Aims	
No.	Aim
1	Training students to identify and formulate essential knowledge of the basic principles, laws, and theories of physical chemistry and applied chemistry, which are necessary for engineering students. The quantitative and theoretical study of the properties and structure of matter and their relation to the interaction of matter with energy will be discussed. (AM2)

3. Course Learning Outcomes (CLOs)	
CLO 1	Identify the equation of physical chemistry
CLO 2	Solve quantitative problems in matter change
CLO3	Conduct appropriate experimentation to analyze and objective engineering judgment to draw conclusion.
CLO6	Apply engineering design to investigate the behavior of gases

4 Course Contents

Topics	Week
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States of matter.	1
Gases.	2
Work done of gases.	3
Liquids.	4
Solid.	5
Solutions.	6
Thermochemistry.	7
Application on thermochemistry.	8
Laws of thermodynamics.	10
Application on thermodynamics.	11
Chemistry of Cement.	12
Water hardness and its treatment.	13
Water hardness and its treatment.	14
Revision	15

5. Teaching and Learning methods												
Course learning Outcomes (CLOs)	Teaching and Learning Methods											
	Lectures	Assignment	Labs	Research and Reports	Projects	Presentation	Site Visits	Discussion and Dialogue	Brain storm	E-Learning	Self-learning	Modeling and Simulation
CLO 1	√	√	-	√	-	-	-	-	√	-	√	-
CLO 2	√	√	-	√	-	-	-	-	√	-	√	-
CLO3	√	-	√	-	-	-	-	-	√	-	√	-
CLO6	√	-	-	-	-	-	-	-	√	-	√	-

6. Teaching and Learning methods of Disabled Students

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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	Clo3
2	Reports	Clo1,clo2
3	sheets	Clo1,clo2
4	Quizzes	Clo1
5	Mid-term Exam	Clo6
6	Oral/ Practical Exam	Clo3
7	Final Exam	Clo1,clo2,clo6

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	5%	5
	Attendance	-	-
	Quizzes	5%	5
	Mid-term exam	10%	10
Practical / Oral	Practical Attendance	5%	5
	Lab. Reports	5%	5
	Lab. Activities / Projects	-	-
	Final oral / practical exam	10%	10
Final Exam		60%	60
Total		100%	100

8. List of References

- [1] Atkins. Peter, Julio de Paula, James Keeler, "Physical chemistry ", 11th ed , Oxford University Press, 2019.
- [2] I.N. Levine, " Physical chemistry", 6th ed, The McGraw-Hill Companies, 2009.
- [3] J. Brady and G. Humistom "General chemistry, Principles and structure", 5th ed, John Wiley and Sons Inc., 1990.
- [4] Francis A Carey, Robert M Giuliano, 11th ed, Mc Graw Hill Education, 2017.

9. Facilities required for teaching and learning

Lecture



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10. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	States of matter Lab1: Introduction	1	CLO1,CLO3
2	Gases. Lab2: Determination of the concentration of sodium hydroxide solution using standard solution of hydrochloric acid.	1	CLO3,CLO6
3	Work done of gases. Lab2: Determination of the concentration of sodium hydroxide solution using standard solution of hydrochloric acid.	1	CLO3,CLO6
4	Liquids. Lab3: Determination of the concentration of sodium carbonate solution by using a standard solution of hydrochloric acid.	1	CLO2,CLO3
5	Solid. Lab3: Determination of the concentration of sodium carbonate solution by using a standard solution of hydrochloric acid.	1	CLO2,CLO3
6	Solutions. Lab4: Determination of total hardness of water.	1	CLO2,CLO3
7	Thermochemistry. Lab4: Determination of total hardness of water.	1	CLO1,CLO3
8	Laws of thermodynamics. Lab5: Identification of the acidic radical (Anions).	1	CLO1,CLO3
10	Application on thermochemistry. Lab5: Identification of the acidic radical (Anions).	1	CLO1,CLO3
11	Application on thermodynamics. Lab6: Identification of the basic radical (Cations).	1	CLO1,CLO3
12	Chemistry of Cement. Lab6: Identification of the basic radical (Cations).	1	CLO2,CLO3
13	Water hardness and its treatment. Lab7: Revision	1	CLO2,CLO3
14	Water hardness and its treatment. Lab7: Revision	1	CLO2,CLO3
15	Revision.	1	CLO1,CLO2,CLO3,CLO6

11. Matrix of Program PLOs with Course CLOs

Program PLOs	Course CLOs
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PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics. Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	CLO 1	Identify the equation of physical chemistry
		CLO 2	Solve quantitative problems in matter change
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	Conduct appropriate experimentation to analyze and objective engineering judgment to draw conclusion.
PLO3	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.	CLO6	Apply engineering design to investigate the behavior of gases

Title	Name	Signature
Course coordinator	Ass.Prof. Dr. Rehab Ali Ass.Prof .Dr. Nagwa Hussien	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Head of Department	Asso. Prof. Dr. Sherif Ahmed Mohamed	
Date of Approval	1/10/2022	

	Ministry of Higher Education Higher Institute of Engineering and Technology, Fifth Settlement Civil Engineering Department	
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Course Specification	
Course Code: MCE 0201	Course Title: Engineering drawing & projection (2)

1. Basic information				
Program Title	Civil Engineering Depart.			
Department offering the program	Civil Engineering Depart.			
Department offering the course	Engineering Mathematics and Physics department			
Course Code	MCE 0201			
Prerequisites	None			
Year/level	Prep. Year / First Level			
Specialization	Minor			
Teaching Hours	Lectures	Tutorial	Practical	Total
	2	4	0	6

2. Course Aims	
No.	Aim
1	Providing students with the basic, knowledge and skills of engineering drawing concepts and principles, as well as fundamentals of drawing projections. The course also covers the basic principles of drawing with various applications. Students will learn to work efficiently by using data analysis and objective engineering judgment. (AM3)

3. Learning Outcomes (LOs)	
CLO 3	Develop and conduct appropriate to Demonstrate the Methodology of solving problems in orthographic views.
CLO16	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.
CLO17	Use creative, innovative, and flexible thinking to respond to new situations.

4 Course Contents



Topics	Week
Review on the drawing of the third projector with the knowledge of the other projections.	1
How to make a section in the engineering drawing.	2
Definition of the different Types in section bodies.	3
Definition of the different Types in section bodies.	4
Intersections of bodies and surfaces and development of surfaces.	5
How to draw the screw and nut in screwed joints.	6
Drawing of the sections for different types of screwed joints.	7
Drawing of the sections for different types of screwed joints.	8
Identification for different of steel sections.	10
Identification for different of steel sections.	11
Drawing of the sections for different types of steel joints.	12
Drawing of the sections for different types of steel joints.	13
Assembly of some mechanical components.	14
Assembly of some mechanical components.	15

5. Teaching and Learning methods												
Course learning Outcomes (CLOs)	Teaching and Learning Methods											
	Lectures	Assignment	Labs	Research and Reports	Projects	Presentation	Site Visits	Discussion and Dialogue	Brain storm	E-Learning	Self-learning	Modeling and Simulation
CLO 3	√	-	-	√	-	-	-	√	-	-	-	-
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	CLO3, CLO16,CLO17-
2	Reports	CLO3, CLO16,CLO17
3	Quizzes	-----
4	Mid-term Exam	CLO3, CLO16
5	Final Exam	CLO3, CLO16,CLO17

7.2 Assessment Schedule

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

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets / Activities	%40	60	20%	30
	Attendance			6.67%	10
	Quizzes			-	-
	Mid-term exam			%13.33	20
Final Exam	Written exam	%60	90	%60	90
Total		%100	150	%100	150



8. List of References

- [1] C. Simmons, D. Maguive, and N. Phelps, 'Manual of Engineering Drawing', Elsevier Ltd., 2009.
- [2] Frederick Giesecke et al, Technical drawing. Tenth Edition, Prentice Hall. (2011)
- [3] Mahesh Chandra Luintel, Engineering Drawing II, Heritage Publishers and Distributors Pvt. Ltd., (2019), ISBN: 978-9937-9365-1-4

9. Facilities required for teaching and learning

Lecture/Classroom

White board

10. Matrix of Course Content with Course CLO's

Topics	Aim	CLO's
Review on the drawing of the third projector with the knowledge of the other projections.	1	CLO3
How to make a section in the engineering drawing.	1	CLO3
Definition of the different Types in section bodies.	1	CLO4, CLO17
Definition of the different Types in section bodies.	1	Clo3, Clo17.
Intersections of bodies and surfaces and development of surfaces.	1	Clo3, Clo17
How to draw the screw and nut in screwed joints.	1	Clo3, Clo17
Drawing of the sections for different types of screwed joints.	1	Clo3, Clo17
Drawing of the sections for different types of screwed joints.	1	Clo3, Clo17.
Identification for different of steel sections.	1	Clo3, Clo17.
Identification for different of steel sections.	1	Clo3, clo16, Clo17.
Drawing of the sections for different types of steel joints.	1	Clo3, clo16, Clo17.
Drawing of the sections for different types of steel joints.	1	Clo3, clo16, Clo17.
Assembly of some mechanical components. Tutorials :Mid term	1	Clo3, clo16, Clo17.
Assembly of some mechanical components.	1	Clo3, clo16, Clo17.



11. Matrix of Program PLOs with Course CLOs

Program PLOs		Course CLOs	
Plo2	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO 3	Develop and conduct appropriate to Demonstrate the Methodology of solving problems in orthographic views.
Plo8	Communicate effectively graphically, verbally and in writing – with a range of audiences using contemporary tools.	CLO16	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.
Plo9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	CLO17	Use creative, innovative, and flexible thinking to respond to new situations.

Title	Name	Signature
Course coordinator	Dr / Mohamed Abdelrahman	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Asso. Prof. Dr. Sherif Ahmed Mohamed	
Date of Approval	1/10/2022	

	Ministry of Higher Education Higher Institute of Engineering and Technology, Fifth Settlement Civil Engineering Department	
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Course Specification	
Course Code: MCE0202	Course Title: Production Technology

1. Basic information

Program Title	Civil Engineering Depart.			
Department offering the program	Civil Engineering Depart.			
Department offering the course	Engineering Mathematics and Physics department			
Course Code	MCE0202			
Year/level	Prep year / (First Level)			
Specialization	Minor			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	0	2	5

2. Course Aims

No.	Aim
1	The course focuses on graduating engineering cadres who are capable of working efficiently and effectively in various design areas, equipping architectural engineers with a comprehensive understanding of engineering materials, their classifications, and manufacturing processes. This enables them to make informed decisions in construction projects. The course also emphasizes the importance of safe machine and tool usage and effective teamwork, while adhering to safety and environmental regulations to ensure the creation of secure and sustainable architectural designs and structures.(AM1)

3. Course Learning Outcomes (CLOs)

CLO6	Apply engineering design processes to produce cost-effective solutions.
CLO15	Function efficiently as an individual and as a member of multi-disciplinary and multi- cultural teams



4. Course Contents

Topics	Week
Material properties	1
Material classification	2
Casting fundamentals	3
Fundamentals of forming processes	4
Bulk forming processes	5
Sheet metal process	6
Polymer forming processes	7
Joining processes	8
Fundamentals of Machining processes	10
Machining processes	11
Wood machining	12
History of technology	13
Fourth industrial revolutions	14
Revision	15

5. Teaching and Learning methods

Course learning Outcomes (CLOs)	Teaching and Learning Methods											
	Lectures	Assignment	Labs	Research and Reports	Projects	Presentation	Site Visits	Discussion and Dialogue	Brain storm	E-Learning	Self-learning	Modeling and Simulation
CLO6	√		√					√	√	-	-	-
CLO15	√		√						√			

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	CLO15
2	Quizzes	CLO6, CLO15
3	Mid-term Exam	CLO6
4	Oral/Practical Exam	CLO6, CLO15
5	Final Exam	CLO6, CLO15

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
3	Quizzes	Bi-weekly
4	Mid-term Exam	9
5	Oral/ Practical Exam	15
6	Final Exam	16

7.3 Weighting of Assessments

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



8. List of References

- [1] Manufacturing, Engineering and Technology, Serope Kalpakjian, Addison-Wesley. 2013
[2] Bruce J. Black, "Workshop Processes, Practices, and Materials" Fourth Edition, Elsevier 2010.
[3] R. Singh, "Introduction to Basic Manufacturing Processes and Workshop Technology" New Age International (P) Limited Publishers, New Delhi 2006.
(4) Sreeramulu Moinikunta, "Production Technology: A Treatise Of Industrial Practices", Vol.1, Wiley Publisher, 2018, ISBN: 812657125X

9. Facilities required for teaching and learning

Lecture/Classroom

White board

Data show

10. Matrix of Course Content with Course LO's

Week No.	Topics	Aim	LO's
1	Material properties Labs: Casting processes workshop	1	CLO6
2	Material classification Labs: Casting processes workshop	1	CLO6
3	Casting fundamentals Labs: Forming workshop	1	CLO6
4	Casting processes Labs: Forming workshop	1	CLO6
5	Fundamentals of forming processes Lab: Welding workshop	1	CLO6
6	Bulk forming processes Lab: Welding workshop	1	CLO6, CLO15
7	Sheet metal processes Lab: Carpentry workshop	1	CLO6, CLO15
8	Polymer forming processes Lab: Carpentry workshop	1	CLO6, CLO15
10	Joining processes Lab: Machine workshop	1	CLO6, CLO15
11	Fundamentals of Machining processes Lab: Machine workshop	1	CLO6, CLO15
12	Machining processes Lab: Machine workshop	1	CLO6, CLO15
13	Wood machining Lab: Machine workshop	1	CLO6, CLO15
14	History of technology Lab: Revision	1	CLO6, CLO15
15	Fourth industrial revolutions Lab: Oral Exam	1	CLO15



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6. Matrix of Program LOs with Course LOs

Program LOs		Course LOs	
PLO3	Apply engineering design processes to design 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.	CLO6	Apply engineering design processes to produce cost-effective solutions.
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	Asso. Prof. Dr. Mohamed Awed	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Asso. Prof. Dr. Sherif Ahmed Mohamed	
Date of Approval	1/10/2022	