

	Ministry of Higher Education	
	Higher Institute of Engineering and technology, fifth district	
	Architectural Eng. Department Course Specification- 2022-2023	

<b>Course Specification</b>	
<b>Course Code: CSE0101</b>	<b>Course Title: Computer technology</b>

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

<b>2. Course Aims</b>	
<b>No.</b>	<b>Aim</b>
1	Use data analysis, objective engineering judgment, and simulation.( AM1.1)
2	Produce innovative design engineering solutions in many practices field of design and executive architecture engineering and urban planning at the local, regional, and international levels. ( AM1.2)

<b>3. Course Learning Outcomes (CLOs)</b>	
CLO 1	Solve and formulate complex computer and technology problems by applying engineering fundamentals, and mathematics.
CLO 9	Utilize contemporary technologies, codes of practice and standards.
CLO 16	Communicate effectively – graphically, with a range of problems of computer technology using contemporary tools.

<b>4. Course Contents</b>	
<b>Topics</b>	<b>Week</b>
<b>Computer hardware:</b> Types of Computers, Central Processing Unit, Arithmetic and logic unit, and Control unit.	1
<b>Computer hardware:</b> Input devices- output devices.	2



<b>Computer hardware:</b> Memory types- Registers.	3
<b>Number systems:</b> Decimal- Binary- Octal -Hexadecimal numbers. Conversion from any number system to any number system. Addition in binary system	4
<b>Number systems:</b> Negative numbers in binary system one's and two's complement – sign magnitude. Subtraction in binary system	5
<b>Introduction to C programming language:</b> Variable types, Write an equation, Input and output commands, and flow charts.	6
<b>C programming language:</b> Decision making (if-else rule)	7
<b>C programming language:</b> Loops (for - while rules), and nested loops	8
<b>C programming language:</b> Write different programs	10
<b>C programming language:</b> Find and correct the errors in a program. Find the output of any program.	11
<b>Introduction to network:</b> Network classifications according to the network media, architecture, size and topology.	12
<b>Multimedia:</b> (images – videos -audio)	13-14
<b>Practical Exam</b>	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 1	√	√						√	√			
CLO 9	√	√						√	√			
CLO16	√	√	√					√	√			

## 6. Students' Assessment

### 6.1 Students' Assessment Method

No.	Assessment Method	LOs
1	reports	CLO1,CLO16
2	Quizzes	CLO1,CLO9,CLO16
3	Midterm exam	CLO1,CLO9
4	Oral exam	CLO1,CLO9,CLO16
5	Written exam	CLO1,CLO9,CLO16

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### 6.2 Assessment Schedule

No.	Assessment Method	Weeks
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
<b>Teacher Opinion</b>	Reports / sheets / Activities	40%	40	0%	0
	Attendance				
	Quiz 1 / Quiz 2			10%	10
	Mid-term exam			20%	20
	Oral exam			10%	10
<b>Final Exam</b>		60%	60	60%	60
<b>Total</b>		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

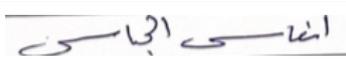
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<b>9. Matrix of Course Content with Course LO's</b>		
Topics	Aim	LO's
<b>Computer hardware:</b> Types of Computers, Central Processing Unit, Arithmetic and logic unit, and Control unit.	1	CLO9
<b>Computer hardware:</b> Input devices- output devices.	1	CLO9
<b>Computer hardware:</b> Memory types- Registers.	1	CLO9
<b>Number systems:</b> Decimal- Binary- Octal -Hexadecimal numbers. Conversion from any number system to any number system. Addition in binary system	1	CLO1
<b>Number systems:</b> Negative numbers in binary system one's and two's complement – sign magnitude. Subtraction in binary system	1	CLO1
<b>Introduction to C programming language:</b> Variable types, Write an equation, Input and output commands, and flow charts.	1	CLO9,CLO16
<b>C programming language:</b> Decision making (if-else rule)	1	CLO9,CLO16
<b>C programming language:</b> Loops (for - while rules), and nested loops	1	CLO9,CLO16
<b>C programming language:</b> Write different programs	1	CLO9,CLO16
<b>C programming language:</b> Find and correct the errors in a program. Find the output of any program.	1	CLO9,CLO16
<b>Introduction to network:</b> Network classifications according to the network media, architecture, size and topology.	1	CLO9,CLO16
<b>Multimedia:</b> (images – videos -audio)	1	CLO9,CLO16
<b>Practical Exam</b>	1	CLO9,CLO16
<b>Computer hardware:</b> Types of Computers, Central Processing Unit, Arithmetic and logic unit, and Control unit.	1	CLO9,CLO16

<b>10. Matrix of Program LOs with Course LOs</b>			
Program LOs		Course LOs	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO 1	Solve and formulate complex computer and technology problems by applying engineering fundamentals, and mathematics.
PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management	CLO 9	Utilize contemporary technologies, codes of practice and standards.

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	principles.		
PLO8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	CLO16	Communicate effectively – graphically, with a range of problems of computer technology using contemporary tools.

Title	Name	Signature
Course coordinator	Dr. Enas Mahmoud Elgbbas	
Head of Department	Assoc. Dr. Reham Othman	
Date of Approval	1/10/2022	

	<b>Ministry of Higher Education</b>	
	<b>Higher Institute of Engineering and Technology</b>	
	<b>Architecture Eng. Department</b>	

<b>Course Specification</b>	
<b>Course Code: MCE 0101</b>	<b>Course Title: Engineering drawing (1)</b>

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

<b>2. Course Aims</b>	
<b>No.</b>	<b>Aim</b>
1	Use the basic, knowledge and skills of the concepts and principles of engineering drawing and fundamental of drawing projections. The basic principles of drawing with several applications are also studied. Work efficiently by using data analysis, objective engineering judgment (AM 1.1)

<b>3. Learning Outcomes (CLOs)</b>	
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.
CLO18	Acquire entrepreneurial and leadership skills to anticipate new situations.

<b>4. Course Contents</b>
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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

<b>5. Teaching and Learning methods</b>												
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	√	√		√				√	√			
CLO16	√	√		√				√	√			
CLO17	√	√		√				√	√			
CLO18	√	√		√				√	√			

## 6. Students' Assessment

6.1 Students' Assessment Method		
N.	Assessment Method	LOs
1	Attendance	-----
2	Reports	Clo1, Clo2, Clo16, Clo17, Clo18
3	Quiz	Clo1, Clo2
4	Mid-term Exam	Clo1, Clo2, Clo16, Clo17, Clo18
5	Written Exam	Clo1, Clo2, Clo16, Clo17, Clo18

6.2 Assessment Schedule		
No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports	weekly
3	Quiz	8
4	Mid-term Exam	14
5	Final Exam	16

6.3 Weighting of Assessments			
	Assessment Method	Weights%	Weights
<b>Teacher Opinion</b>	Reports	10%	10
	Quiz 1	10%	10
	Mid-term exam	20%	20
<b>Final Exam</b>		60%	60
<b>Total</b>		100%	100

## 7. 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 Publication; 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

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### 8. Facilities required for teaching and learning

Lecture
White board
Classroom

### 9. Matrix of Course Content with Course LO's

Topics	Aim	LO's
Introduction of principles of engineering lines used in drawing.	1	Clo1, Clo2
Geometric construction theories of view derivation	1	Clo1, Clo2, Clo17
Orthographic projection of engineering bodies.	1	Clo1, Clo16.
Orthographic projection of engineering bodies.	1	Clo1, Clo16,Clo17
Projection of point, lines, surfaces, and bodies.	1	Clo1, Clo16
How to divide of engineering drawing board and general engineering drawing	1	Clo1, Clo17
Drawing engineering operations and some application on it.	1	Clo16, Clo17, Clo18,
Drawing engineering operations and some application on it.	1	Clo16, Clo17, Clo18
Drawing of simple isometrics and its projections.		
Drawing of simple isometrics and its projections.	1	Clo16, Clo17, Clo18
Drawing of complicated isometrics with inclined surfaces.	1	Clo1, Clo2, Clo16, Clo17, Clo18
Drawing of complicated isometrics with inclined surfaces.	1	Clo16, Clo17, Clo18
Drawing of the third projection with the knowledge of the other projectors.	1	Clo16, Clo17, Clo18
Drawing of the third projection with the knowledge of the other projectors.	1	Clo1, Clo2, Clo16, Clo17, Clo18
Introduction of principles of engineering lines used in drawing.	1	Clo2, Clo16, Clo17, Clo18

### 10. Matrix of Program LOs with Course LOs

Program LOs		Course LOs	
Plo1	Identify, formulate, and solve complex engineering	CLO 1	Identify and formulate complex engineering problems by applying

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	<b>Architecture Eng. Department</b>	

	problems by applying engineering fundamentals, basic science, and mathematics.		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.
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.
		CLO18	Acquire entrepreneurial and leadership skills to anticipate new situations.

Title	Name	Signature
<b>Course coordinator</b>	<b>Dr. Mohamed Abdelrahman</b>	
<b>Head of Department</b>	<b>Ass.Prof. Dr. Reham Othman</b>	
<b>Date of Approval</b>	<b>1-10-2022</b>	

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	<b>Architecture Eng. Department</b>	

<b>Course Specification</b>	
<b>Course Code:</b> HUM0101	<b>Course Title:</b> Technical Language

<b>1. Basic information</b>				
<b>Program Title</b>	Architecture Engineering Depart.			
<b>Department offering the program</b>	Architecture Engineering Depart.			
<b>Department offering the course</b>	Engineering Mathematics and Physics department			
<b>Course Code</b>	HUM0101			
<b>Prerequisites</b>	None			
<b>Year/level</b>	Prep. Year / First Level			
<b>Specialization</b>	<b>Minor</b>			
<b>Teaching Hours</b>	Lectures	Tutorial	Practical	Total
	2	-	-	2

<b>2. Course Aims</b>	
<b>No.</b>	<b>Aim</b>
1	Provide the students with techniques, skills, and some English grammar and rules necessary for effectively writing numbers, equations, symbols, and some different types of technical documents such as reports, proposals, letters, and presentations. (AM3.1)

<b>3. Course Learning Outcomes (CLOs)</b>	
CLO1	Identify technical words problems by applying engineering fundamentals and basic science
CLO16	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.

<b>4. Course Contents</b>	
<b>Topics</b>	<b>Week</b>
Review of English Grammar and Mechanics of Language (Capitalization –Punctuation)	1
Review of English Grammar and Mechanics of Language (Capitalization –Punctuation)	2
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

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	<b>Architecture Eng. Department</b>	

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"> <li>• Letters</li> <li>• reports</li> <li>• manuals</li> <li>• proposals</li> <li>• presentations</li> </ul>	14
Applications of technical writing <ul style="list-style-type: none"> <li>• Letters</li> <li>• reports</li> <li>• manuals</li> <li>• proposals</li> <li>• presentations</li> </ul>	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
CLO1	√							√			√	
CLO16	√	√		√				√				

6. Students' Assessment		
6.1 Students' Assessment Method		
No.	Assessment Method	CLOs
1	Attendance	-----
2	Reports	CLO16
3	Discussions	CLO1, CLO16
4	Quiz	CLO1
5	Mid-term Exam	CLO1, CLO16
6	Written Exam	CLO1, CLO16

6.2 Assessment Schedule		
No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports	Bi-weekly
3	Discussions	Weekly
4	Quiz	5

5	Mid-term Exam	9
6	Written Exam	16

### 6.3 Weighting of Assessments

	Assessment Method	Weights%	Weights
<b>Teacher Opinion</b>	Reports	10%	10
	Discussions	5%	5
	Quiz	5%	5
	Mid-term exam	20%	20
<b>Final Exam</b>		60%	60
<b>Total</b>		100%	100

### 7. 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

### 8. Facilities required for teaching and learning

Lecture  
 White board  
 Classroom

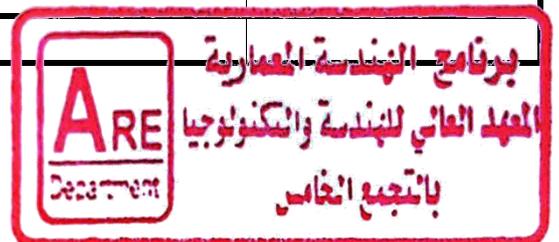
### 9. Matrix of Course Content with Course LO's

Topics	Aim	CLO's
Review of English Grammar and Mechanics of Language (Capitalization –Punctuation)	1	CLO16
Review of English Grammar and Mechanics of Language (Capitalization –Punctuation)	1	CLO16
Some characteristics of Technical Language (Abbreviation)	1	CLO16
How to write numbers, units, equations, symbols, and units of measure	1	CLO1, CLO16
How to write numbers, units, equations, symbols, and units of measure	1	CLO1, CLO16
Technical words problems: such as jargons, Big words, Wordy phrases, Redundancies, Clichés, Nouns as adjectives, and Misused and troublesome words and phrases	1	CLO1
Technical words problems: such as jargons, Big words, Wordy phrases, Redundancies, Clichés, Nouns as adjectives, and Misused and	1	CLO1

troublesome words and phrases		
Technical words problems: such as jargons, Big words, Wordy phrases, Redundancies, Clichés, Nouns as adjectives, and Misused and troublesome words and phrases	1	CLO1
Rules and Principals of technical writing	1	CLO1, CLO16
Rules and Principals of technical writing	1	CLO1, CLO16
Good technical writing	1	CLO16
Good technical writing	1	CLO16
Applications of technical writing <ul style="list-style-type: none"> <li>• Letters</li> <li>• reports</li> <li>• manuals</li> <li>• proposals</li> </ul> presentations	1	CLO16
Applications of technical writing <ul style="list-style-type: none"> <li>• Letters</li> <li>• reports</li> <li>• manuals</li> <li>• proposals</li> </ul> presentations	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.	CLO1	Identify technical words problems by applying engineering fundamentals and basic science
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	
Head of Department	Ass.Prof.Reham Othman	
Date of Approval	1-10-2022	





Ministry of Higher Education  
Higher Institute of Engineering and Technology  
Architecture Engineering Department



### Course Specification

Course Code: PHM0101

Course Title: Mathematics (1)

#### 1. Basic information

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

#### 2. Course Aims

No.	Aim
1	Use data analysis, objective engineering judgment, and simulation (AM1.1).

#### 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	solve and interpret data, assess by using statistical analyses to draw conclusions.

#### 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
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
Clo1	√	-	-	-	-	-	-	-	√	-	-	
Clo2	-	√	-	-	-	-	-	√	√	-	√	
Clo4	-	√	-	-	-	-	-	√	√	-	√	

6. Students' Assessment		
6.1 Students' Assessment Method		
No.	Assessment Method	CLOs
1	Attendance	-
2	Written exam	Clo1, Clo2, Clo4
3	Discussions	-
4	Mid Term Exam	Clo2
5	Class works	-
6	Projects	-
7	Researches	-
8	Reports	Clo2, Clo4
9	Presentations	-
10	Quiz	Clo2, Clo4
11	Skiz	-
6.2 Assessment Schedule		
No.	Assessment Method	Weeks
1	Attendance	-
2	Written exam	16
3	Discussions	-
4	Mid Term Exam	9
5	Class works	-
6	Projects	-
7	Researches	-
8	Reports	Bi-weekly
9	Presentations	-
10	Quiz	6 & 10
11	Skiz	-

7.3 Weighting of Assessments			
	Assessment Method	Weights%	Weights
Teacher Opinion	Reports	10%	15
	Quiz	10%	15



	Mid-term exam	30%	45
<b>Final Exam</b>		50%	75
<b>Total</b>		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”, 6<sup>th</sup> 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

Topics	Aim	CLO's
Derivatives and techniques of differentiation- introduction of conics	1	Clo1, Clo2
Trigonometric functions: properties, derivatives - Parabola	1	Clo1, Clo2, Clo4
Chain rule, implicit, parametric differentiation- Parabola	1	Clo1, Clo2
Extreme, points of inflection, asymptotes and curve fitting- Parabola.	1	Clo1, Clo2, Clo3, Clo4
Indefinite integral and change of variables., Topics of parabola	1	Clo1, Clo2
Definite integral, Ellipse	1	Clo1, Clo2, Clo3, Clo4
Logarithmic and exponential functions: properties, derivatives and integrals-Ellipse	1	Clo1, Clo2, Clo3, Clo4
Logarithmic and exponential functions: properties, derivatives and integrals-Hyperbola	1	Clo4
Mid term	1	Clo1, Clo2, Clo3, Clo4
Integral of Trigonometric functions- Hyperbola	1	Clo1, Clo2, Clo3
Definite integral and its applications to area, volumes, arc length and surface- Rotation of axes.	1	Clo1, Clo2, Clo3
Definite integral and its applications to area, volumes, arc length and surface- Planes.	1	Clo1, Clo2
L'Hopital Rule-Planes	1	Clo1, Clo2, Clo3, Clo4
L'Hopital Rule- straight line.	1	Clo1, Clo2, Clo3, Clo4

## 11. Matrix of Program LOs with Course LOs

Program LOs	Course LOs
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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.
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.	CLO 4	Solve and interpret data, assess by using statistical analyses to draw conclusions.

Title	Name	Signature
Course coordinator	Dr. Eman Abdelaziz	
Head of Department	Ass.Prof. Dr. Reham Othman	
Date of Approval	01/10/2022	



		
	Ministry of Higher Education Higher Institute of Engineering and Technology Architecture Engineering Department	

### Course Specification

**Course Code:** PHM0103

**Course Title:** mechanics (1)

#### 1. Basic information

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

#### 2. Course Aims

No.	Aim
1	Work efficiently to understand the principles of the mechanics and statics of particles, moments, Equilibrium's equations and solve any problem in a simple and logical manner. (AM1-1)

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

## 6. Students' Assessment

### 6.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	-
2	Written exam	CLO1, CLO2, CLO5
3	Discussions	-
4	Mid Term Exam	CLO1, CLO2
5	Class works	CLO1, CLO2, CLO5
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 (11<sup>th</sup> Edition) R.C. HIBBELER , 2008
- [4] Engineering Mechanics: Statics (13<sup>th</sup> 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

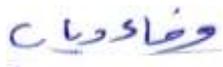
### 10. Matrix of Course Content with Course LO's

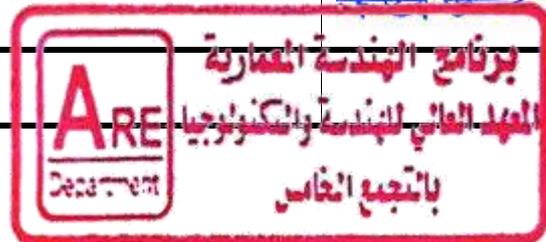
Topics	Aim	CLO's
General principles , fundamental concepts , units of Measurements	1	CLO1-CLO2
Scalars and vectors, vector operations, vector addition of forces	1	CLO1-CLO2
Position vectors, force vector directed along line, Dot product and cross product	1	CLO1-CLO2
Moment of a force ( scalar formulation and vector formulation)	1	CLO1-CLO2
Moment of a couple, equivalent system, resultants of force and couple system	1	CLO1-CLO2
Equilibrium of a particle, condition for the equilibrium of a particle, the free body diagrams.	1	CLO1-CLO2
Coplanar force systems	1	CLO1-CLO2
Three- dimensional force systems.	1	CLO1-CLO2
Condition for of a rigid boy in two dimensions, free body diagrams, equations of equilibrium..	1	CLO1-CLO2-

Equilibrium of a rigid body in three dimension, free body diagrams, equations of equilibriums.	1	CLO1-CLO2 -CLO5
Simple trusses	1	CLO1-CLO2 -CLO5
Frames and machines.	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, 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.
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	Dr. Wafaa Diab	
Head of Department	Associa. Prof. Reham Othman	
Date of Approval	01/10/2022	



		
	Ministry of Higher Education Higher Institute of Engineering and Technology Architecture Engineering Department	

### Course Specification

**Course Code: PHM0102**

**Course Title: Physics (1)**

#### 1. Basic information

<b>Program Title</b>	Architecture Engineering Department			
<b>Department offering the program</b>	Architecture Engineering Department			
<b>Department offering the course</b>	Engineering Mathematics and Physics department			
<b>Course Code</b>	PHM0102			
<b>Year/level</b>	First Level/ (1 <sup>st</sup> Semester)			
<b>Specialization</b>	<b>Minor</b>			
<b>Teaching Hours</b>	Lectures	Tutorial	Practical	Total
	4	1	1	6

#### 2. Course Aims

No.	Aim
1	Use data analysis to understand <u>Properties of matter</u> : Units and dimensions, Physical mechanics, Potential energy gradient, Circular motion, Moment of inertia, Elastic properties of materials, Hydrostatics and surface tension, Hydrodynamics and viscosity. <u>Geometrical optics</u> : Refraction of light, Prisms, Reflection of light, Lenses, Lens aberration. (AM1.1)

#### 3. Course Learning Outcomes (CLOs)

CLO1	Identify complex engineering problems by applying engineering fundamentals, basic science, and mathematics.
CLO2	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.
CLO4	Assess data by using statistical analyses to draw conclusions.
CLO5	Evaluate findings by using 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
Viscosity	10
Bernoulli's equation and its applications	11

		
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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												
	Teaching and Learning Methods												
	Course learning Outcomes (CLOs)	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. Students' Assessment

6.1 Students' Assessment Method		
No.	Assessment Method	CLOs
1	Attendance	-
2	Written exam	CLO1, CLO2, CLO4, CLO5
3	Discussions	-
4	Mid Term Exam	CLO1, CLO2, CLO4,
5	Class works	-
6	Projects	-
7	Researches	-
8	Reports	-
9	Presentations	-
10	Quiz	CLO1, CLO2, CLO4,
11	Skiz	-
12	Practical Exam	CLO1, CLO2, CLO4, CLO5

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	-
6	Projects	-
7	Researches	-
8	Reports	-

9	Presentations	-
10	Quiz	6& 10
11	Skiz	-
12	Practical Exam	15

6.3 Weighting of Assessments			
	Assessment Method	Weights%	Weights
<b>Teacher Opinion</b>	Quiz	7%	10
	Mid-term exam	13%	20
<b>Practical</b>	Practical Attendance	20%	30
	Lab. Reports		
	Lab. Activities / Projects		
	Final oral / practical exam		
<b>Final Exam</b>		60%	90
<b>Total</b>		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

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 <b>Labs:</b> Practicing on measuring instruments (micrometer, and vernier).	1	CLO1,CLO2
Rotational motion <b>Labs:</b> Practicing on measuring instruments (micrometer, and vernier).	1	CLO1,CLO2
Moment of inertia <b>Labs:</b> Hook's Law	1	CLO1,CLO2

		
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Elasticity of length, shape and volume <b>Labs:</b> Hooks Law	1	CLO2 ,CLO4
Energy stored in stretched wire , poisson ratio,Bulk modulu`s <b>Labs:</b> Archimedes Principle	1	CLO2 ,CLO4
Absolute pressure, surface tension <b>Labs:</b> Archimedes Principle	1	CLO2 ,CLO4
Capillarity and applications of surface tension <b>Labs:</b> Surface tension	1	CLO2, CLO4
Viscosity <b>Labs:</b> Surface tension	1	CLO2, CLO4
Bernoulli`s equation and its applications <b>Labs:</b> Lenses	1	CLO2, CLO4
Bernoulli`s equation and its applications <b>Labs:</b> Lenses	1	CLO2, CLO4
Types of lenses and image formed <b>Labs:</b> revision	1	CLO4,CLO5
Types of lenses, mirrors and image formed <b>Labs:</b> 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 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.
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	Assess data by using statistical analyses to draw conclusions.
		CLO5	Evaluate findings by using statistical analyses and objective engineering judgment.

<b>Title</b>	<b>Name</b>	<b>Signature</b>
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	Ministry of Higher Education Higher Institute of Engineering and Technology Architecture Engineering Department	

Course coordinator	Assoc. Prof. Rehab Ali	
Head of Department	Assoc. Prof. Reham Othman	
Date of Approval	01/10/2022	



		
	Ministry of Higher Education Higher Institute of Engineering and Technology Architecture Engineering Department	

### Course Specification

**Course Code: PHM0204**

**Course Title: Chemistry**

#### 1. Basic information

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

#### 2. Course Aims

No.	Aim
1	Train the students for innovative and creative thinking, describing basic principles, laws and theories of physical Chemistry, applied chemistry, Quantitative and theoretical study of the properties and structure of matter, which are necessary for engineering students(AM2.1)

#### 3. Course Learning Outcomes (CLOs)

CLO 1	Identify and formulate complex engineering problems by applying engineering fundamentals and basic science such as bonding, molecular geometry, chemical formulas, stoichiometry, gas laws, thermochemistry, and thermodynamics
CLO 2	Develop and conduct appropriate experimentation and/or simulation to draw conclusions regarding chemical structure
CLO9	Utilize contemporary technologies and basic principles and methods of chemistry, such as the metric system, scientific notation and significant figures, the atom and atomic theories and trends of the periodic table of the elements,

#### 4 Course Contents



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Architecture Engineering Department



Topics	Week
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
Revision.	14

5. Teaching and Learning methods												
Course learning Outcomes (CLOs)	Teaching and Learning Methods											
	Lectures	Assignment	Labs	Research	Projects	Presentation	Site Visits	Discussion	Brain storm	E-Learning	Self-learning	Modeling and Simulation
CLO 1	√	-	-	√	-	-	-	-	-	-	-	-
CLO 2	√	-	-	√	-	-	-	-	-	-	-	-
CLO9	√	-	-	-	-	-	-	-	-	-	√	-

## 6. Students' Assessment

### 6.1 Students' Assessment Method

No.	Assessment Method	CLOs
1	Attendance	-
2	Written exam	CLO1-CLO 2-CL09
3	Discussions	--
4	Mid Term Exam	CLO1-CLO 2-CL09
5	Class works	-
6	Projects	-
7	Researches	CLO1-CLO 2
9	Presentations	-

### 6.2 Assessment Schedule

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

### 6.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
<b>Teacher Opinion</b>	Discussions	40%	40	--	-
	Class works			-	-
	Projects			-	-
	Reports			10%	10
	Presentations			-	-
	Quiz			10%	10
	Mid-term exam			20%	20
<b>Final Exam</b>	Written exam	60%	60	60%	60
<b>Total</b>		100%	150	100%	100

### 8. List of References

- [1] Atkins. Peter, Julio de Paula, James Keeler, "Physical chemistry ", 11<sup>th</sup> ed , Oxford University Press, 2019.
- [2] I.N. Levine, " Physical chemistry", 6th ed, The McGraw-Hill Companies, 2009.

[3] Francis A Carey, Robert M Giuliano, 11th ed, Mc Graw Hill Education, 2017.

## 9. Facilities required for teaching and learning

Lecture

White board

## 10. Matrix of Course Content with Course CLO's

Topics	Aim	CLO's
States of matter <b>Lab1:</b> Introduction	1	CLO1,CLO2,CLO9
Gases. <b>Lab2:</b> Determination of the concentration of sodium hydroxide solution using standard solution of hydrochloric acid.	1	CLO2,CLO9
Work done of gases. <b>Lab2:</b> Determination of the concentration of sodium hydroxide solution using standard solution of hydrochloric acid.	1	CLO2,CLO9
Liquids. <b>Lab3:</b> Determination of the concentration of sodium carbonate solution by using a standard solution of hydrochloric acid.	1	CLO2
Solid. <b>Lab3:</b> Determination of the concentration of sodium carbonate solution by using a standard solution of hydrochloric acid.	1	CLO2
Solutions. <b>Lab4:</b> Determination of total hardness of water.	1	CLO1,CLO2
Thermochemistry. <b>Lab4:</b> Determination of total hardness of water.	1	CLO2,CLO9
Laws of thermodynamics. <b>Lab5:</b> Identification of the acidic radical (Anions).	1	CLO2,CLO9
Midterm.	1	CLO2,CLO9
Application on thermochemistry. <b>Lab5:</b> Identification of the acidic radical (Anions).	1	CLO2,CLO9
Application on thermodynamics. <b>Lab6:</b> Identification of the basic radical (Cations) first group.	1	CLO2,CLO9
Chemistry of Cement. <b>Lab6:</b> Identification of the basic radical (Cations) first group.	1	CLO1,CLO2
Water hardness and its treatment. <b>Lab7:</b> Identification of the basic radical (Cations) second group.	1	CLO1,CLO2
Revision. <b>Lab6:</b> Identification of the basic radical (Cations) second group.	1	CLO1,CLO2

### 11. Matrix of Program PLOs with Course CLOs

Program PLOs		Course CLOs	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals and basic science	CLO 1	Identify and formulate complex engineering problems by applying engineering fundamentals and basic science such as bonding, molecular geometry, chemical formulas, stoichiometry, gas laws, thermochemistry, and thermodynamics
		CLO 2	Develop and conduct appropriate experimentation and/or simulation to draw conclusions regarding chemical structure
PLO4	Utilize contemporary technologies and basic principles and methods of chemistry	CLO 9	Utilize contemporary technologies and basic principles and methods of chemistry, such as the metric system, scientific notation and significant figures, the atom and atomic theories and trends of the periodic table of the elements,

Title	Name	Signature
Course coordinator	Ass.Prof. Dr. Rehab Ali Dr. Nagwa Hussen	
Program coordinator	Ass.Prof.Dr.Reham Othman	
Head of Department	Ass.Prof.Dr.Reham Othman	
Date of Approval	1/10/2022	





Ministry of Higher Education  
Higher Institute of Engineering and Technology  
Architecture Engineering Department



### Course Specification

Course Code: PHM0201

Course Title: Mathematics (2)

#### 1. 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	PHM0201			
prerequisite	Mathematics 1			
Year/level	Prep year / (First Level)			
Specialization	<b>Minor</b>			
Teaching Hours	Lectures	Tutorial	Practical	Total
	4	2	0	6

#### 2. Course Aims

No.	Aim
1	Use data analysis, objective engineering judgment, and simulation Relate derivatives and integrals (Fundamental Theorem of calculus). (AM1.1)

#### 3. Course Learning Outcomes (CLOs)

<b>CLO 1</b>	Recognize the inverse, hyperbolic and inverse hyperbolic trigonometric functions and determine derivatives for functions.
<b>CLO 2</b>	Evaluate integrals, using the techniques of integration
<b>CLO 3</b>	Define the Matrices, Theory of Equations and infinite Series.

#### 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 1	√	-	-	√	-	-	-	-	-	-	-	-
CLO 2	-	-	-	√	-	-	-	-	-	-	-	-
CLO 3	√	-	-	√	-	-	-	-	-	-	√	-

### 6. Students' Assessment

#### 6.1 Students' Assessment Method

No.	Assessment Method	CLOs
1	Attendance	-
2	Written exam	CLO1,CLO2,CLO3
3	Discussions	-
4	Mid Term Exam	CLO2,CLO3
5	Class works	-
6	Projects	-
7	Researches	-



8	Reports	CLO2,CLO3
9	Presentations	-
10	Quiz	CLO1,CLO3
11	Skiz	-

### 6.2 Assessment Schedule

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

### 6.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
<b>Teacher Opinion</b>	Discussions	50%	75	--	-
	Class works			-	-
	Projects			-	-
	Reports			10%	15
	Presentations			-	-
	Quiz			10%	15
	Mid-term exam			30%	45
<b>Final Exam</b>	Written exam	50%	75	50%	75
<b>Total</b>		100%	150	100%	150

### 8. List of References

- [1] Stewart. J, "Calculus", 6<sup>th</sup> Edition , 2008.  
 [2]Hamdy M. Ahmed, Mathematics (1), 2019, ISBN 978-977-469-0445  
 [3]George B. Thomas, Calculus, 3<sup>rd</sup> Edition, 2016  
 [4]James Stewart., Calculus, 4<sup>th</sup> 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	Clo1, Clo2
Derivative of hyperbolic and inverse functions-Inverse of matrix	1	Clo1, Clo2
Integration of hyperbolic and inverse functions	1	Clo1, Clo2, Clo3
Linear systems and types of solutions.	1	Clo1, Clo2
Integration by the method of substitution of trigonometric-Properties of Eigenvalues and eigenvectors of matrices method of solve it.	1	Clo1, Clo2, Clo3
Integration by the method of partial fractions. Properties of Eigenvalues and eigenvectors of matrices method of solve it.	1	Clo1, Clo2, Clo3
Properties of Eigenvalues and eigenvectors of matrices method of solve it.	1	Clo1, Clo2, Clo3
Integration by the method of Parts- Theory of equations.	1	Clo1, Clo2
Integration by the method of Parts- Theory of equations.	1	Clo1, Clo2, Clo3
Applications of the definite integral - Theory of equations.	1	Clo2, Clo3
Integration by reduction-infinite series	1	Clo1, Clo2, Clo3
Integration by reduction- infinite series	1	Clo2, Clo3
Wails' formula- infinite series	1	Clo1, Clo2
Revision	1	Clo1, Clo2, Clo3

### 11. Matrix of Program PLOs with Course CLOs

Program PLOs		Course CLOs	
Plo1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO 1	Recognize the inverse, hyperbolic and inverse hyperbolic trigonometric functions and determine derivatives for functions.
		CLO 2	Evaluate integrals, using the techniques of integration



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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	Define the Matrices, Theory of Equations and infinite Series.
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Title	Name	Signature
Course coordinator	Dr. Eman Abdelaziz	
Program coordinator	Ass.Prof. Dr. Reham Othman	
Head of Department	Ass.Prof. Dr. Reham Othman	
Date of Approval	1/10/2022	



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	<b>Higher Institute of Engineering and Technology</b>	
	<b>Architecture Eng. Department</b>	

<b>Course Specification</b>	
<b>Course Code: PHM 0203</b>	<b>Course Title: mechanics (2)</b>

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

<b>2. Course Aims</b>	
<b>No.</b>	<b>Aim</b>
1	Work efficiently 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. (AM1-1)

<b>3. Learning Outcomes (CLOs)</b>	
<b>Clo1</b>	Identify and formulate complex engineering problems by applying engineering fundamentals, basic science, and mathematics
<b>Clo2</b>	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.by applying engineering fundamentals, basic science, and mathematics.
<b>Clo4</b>	analyze and interpret data, assess by using statistical analyses to draw conclusions.
<b>Clo5</b>	evaluate findings and use statistical analyses and objective engineering judgment.
<b>Clo19</b>	Acquire and apply new knowledge.
<b>Clo20</b>	lifelong and other learning strategies ,Practice self

<b>4. Course Contents</b>	
<b>Topics</b>	<b>Week</b>
- Kinematics of particles. - Rectilinear motion of particles (Position, Velocity and acceleration) - two dimension.	1
- Rectilinear motion of particles (Position, Velocity and acceleration) - three dimension.	2
- Curvilinear motion: cylindrical coordinates	3
- Curvilinear motion: normal and tangential (intrinsic) coordinates	4
- Motion of a projectile	5
- relative motion	6
- 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
- Kinetics of particles: work and energy - The work of a force - Principle of work and energy	11
- Power and efficiency - Conservative force and potential energy	12
- Conservation of energy	13
Kinetics of particles: - Principle of linear impulse and momentum - Conservation of linear momentum for a system of particles	14
- Impact	15

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

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Clo1	√	-	-	-	-	-	-	√	√	-	-	-
Clo2	-	√	-	-	-	-	-	√	-	-	-	-
Clo4	√	√	-	-	-	-	-	-	√	-	-	-
Clo5	-	√	-	-	-	-	-	√	-	-	-	-
Clo19	√	-	-	-	-	-	-	√	√	-	-	-
Clo20	√	-	-	-	-	-	-	√	√	-	-	-

## 6. Students' Assessment

### 6.1 Students' Assessment Method

No.	Assessment Method	Clos
1	Attendance	-----
2	Written exam	Clo1, Clo2, Clo4, Clo5, Clo19
3	Discussions	Clo1, Clo2, Clo5, Clo19, Clo20
4	Mid Term Exam	Clo1, Clo2, Clo5
5	Class works	Clo2, Clo4, Clo5
6	Projects	-
7	Researches	-
8	Reports	-
9	Presentations	-
10	Quiz	Clo1, Clo2, Clo5
11	Skiz	-

### 6.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	-
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	-

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### 6.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
<b>Teacher Opinion</b>	Discussions	40	40	2	2
	Class works			8	8
	Quiz			10	10
	Mid-term exam			20	20
<b>Final Exam</b>	Written exam	60	60	60	60
<b>Total</b>		100	100	100	100

### 7. 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

### 8. Facilities required for teaching and learning

Lecture/Classroom

White board

Data show

### 9. Matrix of Course Content with Course LO's

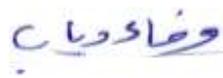
Topics	Aim	CLO's
- Kinematics of particles. - Rectilinear motion of particles (Position, Velocity and acceleration) - two dimension.	1	Clo1, Clo 2,
- Rectilinear motion of particles (Position, Velocity and acceleration) - three dimension.	1	Clo1, Clo 2,
- Curvilinear motion: cylindrical coordinates	1	Clo1, Clo 2,
- Curvilinear motion: normal and tangential (intrinsic) coordinates	1	Clo1, Clo 2,
- Motion of a projectile	1	Clo1, Clo 2, Clo 4
- relative motion	1	Clo1, Clo 2
- Kinetics of particles. ( Force and acceleration) - Newton's Second law of motion.	1	Clo 2, Clo 4, Clo5, Clo19,

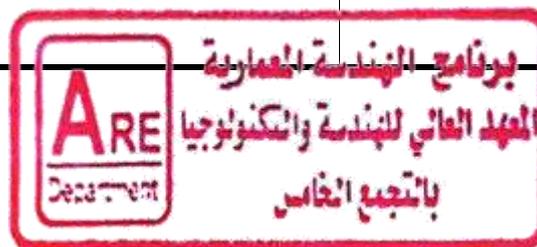
- Equations of motion : rectangular coordinates		
Equations of motion : normal and tangential coordinates	1	Clo 2, Clo 4, Clo5, Clo19, Clo20
Equations of motion : cylindrical coordinates	1	Clo 2, Clo 4, Clo5, Clo19,Clo20
<ul style="list-style-type: none"> <li>- Kinetics of particles: work and energy</li> <li>- The work of a force</li> <li>- Principle of work and energy</li> </ul>	1	Clo 2, Clo 4, Clo5, Clo19,Clo20
<ul style="list-style-type: none"> <li>- Power and efficiency</li> <li>- Conservative force and potential energy</li> </ul>	1	Clo 4, Clo5, Clo6,
- Conservation of energy	1	Clo 4, Clo5, Clo19,Clo20
Kinetics of particles: <ul style="list-style-type: none"> <li>- Principle of linear impulse and momentum</li> <li>- Conservation of linear momentum for a system of particles</li> </ul>	1	Clo 4, Clo5, Clo19,Clo20
- Impact	1	Clo5, Clo19,Clo20

<b>10. Matrix of Program LOs with Course Los</b>			
<b>Program LOs</b>		<b>Course Los</b>	
Plo1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	<b>Clo1</b>	Identify and formulate complex engineering problems by applying engineering fundamentals, basic science, and mathematics
		<b>Clo2</b>	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, analyse 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.
		<b>Clo5</b>	evaluate findings and use statistical analyses and objective engineering judgment.
Plo10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	<b>Clo19</b>	Acquire and apply new knowledge.

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	<b>Architecture Eng. Department</b>	

		<b>Clo20</b>	Practice self, lifelong and other learning strategies.
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Title	Name	Signature
Course coordinator	Dr. Wafaa Diab	
Program coordinator	Assoc. Prof. Reham Othman	
Head of Department	Assoc. Prof. Reham Othman	
Date of Approval	1/10/2022	



		
	Ministry of Higher Education Higher Institute of Engineering and Technology Architecture Engineering Department	

### Course Specification

**Course Code: PHM0202      Course Title: Physics (2)**

#### 1. Basic information

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

#### 2. Course Aims

No.	Aim
1	Use data analysis, objective engineering judgment, and simulation. (AM1.1)

#### 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
Potential difference	2
Electric current	3

		
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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. Students' Assessment

### 6.1 Students' Assessment Method

No.	Assessment Method	CLOs
1	Attendance	-----
2	Written exam	CLO1,CLO2,CLO5
3	Discussions	CLO1,CLO2,CLO5
4	Mid Term Exam	CLO1,CLO2
5	Class works	CLO2,CLO5
6	Projects	-
7	Researches	-
8	Reports	-
9	Presentations	-
10	Quiz	CLO1
11	Laboratory	CLO1,CLO2,CLO5
12	Laboratory Discussion	CLO1,CLO2,CLO5

		
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13	Final practical exam	CLO1,CLO2,CLO5
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6.2 Assessment Schedule		
No.	Assessment Method	Weeks
1	Attendance	-
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	6, 10
11	Laboratory Classwork	15
12	Laboratory Discussion	15
13	Final practical exam	15

6.3 Weighting of Assessments			
	Assessment Method	Weights%	Weights
<b>Teacher Opinion</b>	Class Work	7%	10
	Quiz		
	Mid-term exam	13%	20
<b>Practical / Oral</b>	Lab. Class Work	20%	30
	Lab. Disscucion		
	Final practical exam		
<b>Final Exam</b>	Written Exam	60%	90
<b>Total</b>		100%	150

## 7. 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



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## 8. Facilities required for teaching and learning

Lecture/Classroom

White board

Data Show

## 9. Matrix of Course Content with Course LO's

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

## 10. Matrix of Program LOs with Course LOs

Program LOs	Course LOs
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PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	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.
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	
	Dr. Ahmed Abdelbary	
	Dr.Eman Abdelaziz	
Program coordinator	Assoc. Prof. Reham Othman	
Head of Department	Assoc. Prof. Reham Othman	
Date of Approval	1/10/2022	





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## Course Specification

Course Code: MCE0202

Course Title: Production Technology

### 1. Basic information

Program Title	Architecture Engineering Depart.			
Department offering the program	Architecture 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
	4	3	0	7

### 2. Course Aims

No.	Aim
1	Provide the students with modern academic and technical skills in order to produce manufacturing processes such as manual material removal, machining, forming, welding and casting.(AM3.1)

### 3. Course Learning Outcomes (CLOs)

CLO6	Apply engineering design processes to produce cost-effective solutions.
CLO10	Utilize the quality guidelines, health and safety requirements
CLO11	Utilize risk management principles.
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	Brain storm	E-Learning	Self-learning	Modeling and Simulation
CLO6	√	√	-					√	√	-	-	-
CLO10	√	√	-					√		-	-	-
CLO11	√							√				
CLO15	√	√							√			

## 6. Students' Assessment

### 6.1 Students' Assessment Method



No.	Assessment Method	CLOs
1	Attendance	-
2	Written exam	Clo6, Clo10, Clo11, Clo15
3	Discussions	Clo6, Clo10, Clo11
4	Mid Term Exam	Clo6, Clo10, Clo11
5	Class works	Clo6, Clo10, Clo15
6	Projects	-
7	Researches	
8	Reports	-
9	Presentations	
10	Quiz	Clo6, Clo10, Clo11
11	Skiz	-

### 6.2 Assessment Schedule

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

### 6.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
<b>Teacher Opinion</b>	Discussions	40	40	5	5
	Class works			10	10
	Quiz			5	5
	Mid-term exam			20	20
<b>Final Exam</b>	Written exam	60	60	60	60
<b>Total</b>		100	100	100	100

## 7. List of References



- [1] Manufacturing, Engineering and Technology, Serope Kalpakjian, Addison-Wesley. 2013  
[2] Bruce J. Black, " Workshop Processes, Practices, and Materials" Fourth Edition, Elsevir 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

### 8. Facilities required for teaching and learning

Lecture/Classroom

White board

Data show

### 9. Matrix of Course Content with Course LO's

Topics	Aim	CLO's
Material properties	1	CLO6
Material classification	1	CLO6, CLO10
Casting fundamentals	1	CLO6, CLO10
Fundamentals of forming processes	1	CLO6, CLO10, CLO11
Bulk forming processes	1	CLO10, CLO11
Sheet metal process	1	CLO10, CLO11
Polymer forming processes	1	CLO10, CLO11, CLO15
Joining processes	1	CLO10, CLO11, CLO15
Fundamentals of Machining processes	1	CLO10, CLO11, CLO15
Machining processes	1	CLO6, CLO10, CLO11, CLO15
Wood machining	1	CLO6, CLO10, CLO11, CLO15
History of technology	1	CLO6, CLO10, CLO11, CLO15
Fourth industrial revolutions	1	CLO6, CLO10, CLO11, CLO15
Revision	1	CLO6, CLO10, CLO11, CLO15

### 10. Matrix of Program LOs with Course LOs



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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.
PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles	CLO10	Utilize the quality guidelines, health and safety requirements, environmental issues.
		CLO11	Utilize risk management principles.
PLO7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	CLO15	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.

Title	Name	Signature
Course coordinator	Dr. Mohamed Awed	
Program coordinator	Ass.Prof.Dr. Reham Othman	
Head of Department	Ass.Prof.Dr. Reham Othman	
Date of Approval	1/10/2022	

