27Course Specification of Mechanical Engineering Principles

I. Course Identification and General Information:

1	**Course Title:**	***Mechanical Engineering principles***					
2	**Course Code & Number:**	ME 121					
3	**Credit hours:**	C.H				**Credit Hours**	
		Th.	Tu.	Pr.	Tr.		
		2				**2**	
4	**Study level/ semester at which this course is offered:**	Second Level/ second semester					
5	**Pre –requisite (if any):**	none					
6	**Co –requisite (if any):**	none					
8	**Program (s) in which the course is offered:**	Civil Engineering					
9	**Language of teaching the course:**	English					
10	**Location of teaching the course:**	Facility engineering					
11	**Prepared By:**	Dr. Thabet M. Al-ghaberi					
12	**Date of Approval**	December 2019					

II. Course Description:

This course is to teach students the principles and application of mechanical and industrial engineering and relationships with different functions and projects of civil engineering. It provides useful practical knowledge for Civil engineering equipment and machinery mechanics used in building and construction works, projects and Principles of thermal, electrical and pneumatic systems which help identification of Mechanical and Thermal facilities necessary for buildings, installations and various civil engineering projects.

III. Course Intended learning outcomes (CILOs) of the course		Referenced PILOs
a.1	Demonstrate the knowledge and understanding of the	

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	Machines and equipment used in different engineering testing to Describe its Technical properties and relationships with civil engineering works and projects.	**A5**
a.2	Define the Standards, cods and operation procedures of Technical equipment, systems and facilities used in buildings, installations and various civil engineering works and projects.	**A2.**
b. 1	Identify appropriate solutions engineering problems for engineering problems based on analytical thinking.	**B1.**
b. 2	Demonstrate skills in the evaluation and integration of theoretical information about mechanical engineering equipment and its practices and using in building and construction, works and different civil engineering projects.	**B3**
c.1	Apply the experience and skills necessary to design, installation and operation of heating, cooling systems and technical facilities for civil engineering projects.	**C2**
c.2	Use safely with the techniques and modern engineering equipment, machines and systems necessary for civil engineering works and project.	**C1**
d. 1	Work effectively as a member in a multi-disciplinary team.	**D3**
d. 2	Recognize the need to engage in life- long learning, and achieving effectively self-development.	**D5**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Demonstrate knowledge and understanding of the Machines, equipment and systems used in different engineering testing to Describe its Technical properties and relationships with civil engineering works and projects.	Lectures & Examples Tutorial s and Problem solving Presentation & Discussions	Homework Quizzes Major Exams Practical assessment participation
a2- Define the Standards, cods and operation procedures of Technical equipment, systems and facilities used in buildings, installations and various civil engineering works and projects.	Lectures & Examples Tutorial s and Problem solving Presentation & Discussions	Homework Quizzes Major Exams Practical assessment participation

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Identify appropriate solutions engineering problems for engineering problems based on analytical thinking.	lectures & Class activity Practical work at class Problem-based learning	Homework Quizzes Major Exams Problem Sets (Exercises) participation Reports
b2- Demonstrate skills in the evaluation and integration of theoretical information about mechanical engineering equipment and its practices and using in building and construction, works and different civil engineering projects.		

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© **Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:**		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
C1- Apply the experience and skills necessary to design, installation and operation of heating, cooling systems and technical facilities for civil engineering projects.	Lectures & Class activity Collaborative /Discovery based on Practical training	Homework Quizzes Major Exams Problem Sets (Exercises) participation Reports
C2- Use safely with the techniques and modern engineering equipment, machines and systems necessary for civil engineering works and project.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Work effectively as a member in a multi-disciplinary team.	Lectures & Class activity Practical training	Reports Assigned Prac. Problems
d2- Recognize the need to engage in life- long learning, and achieving effectively self-development.	Lectures & Class activity Practical training	Reports Assigned Prac. Problems

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IV. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	First Part: Mechanical Engineering: Introduction: Definition of principles and foundations of mechanical and industrial engineering and importance of the course, goals, contents, applied and relationships with differences functions and projects of civil engineering.	a1,a2,b2, c1	Mechanical applied relationships in civil engineering, mechanical, thermal, equipment, machines, systems.	1	2
2	Civil engineering equipment and machinery mechanics used in building and construction works, projects, roads and concrete.	a1,a2,b1, c1	Equipment, machinery, mechanics, Civil engineering projects: construction, roads, concrete.	1	2
3	The patterns of mechanical movement and the forces affecting them.	a2,b2,c1, c2	The types of Mechanical movement, affecting forces.	1	2
4	Equipment and parts of movement, transmission and friction.	a1,a2,c1, c2	Movement parts, transmission, friction.	1	2
5	Kinematic diagrams and Describes of machines, equipment and its different parts.	a1,a2,c1	Fundamentals parts of machines, equipment and systems Describing parts, kinematic diagrams,	1	2

6	Wrenches, scaffolding and metal structures used in civil engineering works and projects.	b2,c1,c2	Wrenches, scaffolding and metal structures, compering, technology differences.	1	2
7	Types of equipment, machines and heavy mechanical means related to civil engineering works and projects (crushers - mixers - levers - concrete carriers - mills - hammers and drills - pumps).	a1,a2,b2, c1	Installation, Operation, systems, maintenance works, storage of heavy mechanical equipment, machines used in civil engineering projects.	1	2
8	Second Part Thermal Engineering: Principles of thermal, electrical and pneumatic systems.	a1,a2,b2, c1	Parts, contents, Installation, Operation, systems, maintenance works of thermal, electrical, and pneumatic used in civil engineering projects.	2	4
9	Principles of design, installation and operation of heating and cooling systems and technical facilities for civil engineering works.	a1,a2,c1, c2	Designing, Installation, Operation, systems, maintenance works of heating and cooling systems.	1	2
10	Concepts of design and installation of electrical systems for different buildings.	a1,a2,b2, c1	Concepts of design and installation of electrical systems for different buildings.	1	2
11	Thermal insulation systems for buildings, walls and ovens.	a1,b1,b2, c1	Thermal insulation systems parts,	1	2

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			Engineering materials and properties.		
12	The modern Technical facilities and systems necessary for buildings, installations and various civil engineering projects.	a1,a2,b2, c1`	Modern technology, Standards, cods, properties,	2	4
Number of Weeks /and Units Per Semester				**14**	**28**

V. Teaching strategies of the course:

- Lectures & Examples
Tutorials and Problem solving
-Lectures & Class activity
Practical work at Class.
- Lectures & Class activity
Collaborative /Discovery based on class Practical training
Problem-based learning
Reports.
-Collaborative /Discovery
Based on class Practical training.

VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Homework	a1,a2,b1,b2,c1,c2,d1,d2	2-5	2
2	Presentations.	a1,a2,b1,b2,c1,c2,d1,d2	11	1
3	Scientific research work.	a1,a2,b1,b2,c1,c2,d1,d2	13	2

VII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Quizzes	1,2,3,4,5,6,7, 8,9,10,11,12,13,14	5	5%	a1,a2,b1,b2,c1
2	Assignments & Homework, Tasks & Presentation	1,2,3,4,5,6,7, 8,9,10,11,12,13,14	5	5%	a1,a2,b1,b2,c1
3	Mid-Term exam	8	15	15%	a1,a2,b1,b2,c1
4	Homework projects	13,14	5	5%	a1,a2,b1,b2,c1
5	Final Exam theory	14	70	70%	a1,a2,b1,b2,c1 c2,d1,d2
	Total	**14**	**100**	**100%**	

VIII. Learning Resources:

- Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).

1- Required Textbook(s) (maximum two).

1-Mechanical engineering principles (John bird & Carl Ross) 2015, 2nd edition

2- Essential References.

Student hand book

3- Electronic Materials and Web Sites *etc*.

- CDs & Videos Tapes.
- Sample Industrial Safety Related Websites.

Will be identified through demonstration of online internet search

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I. Course Policies:	
1	**Class Attendance:** - The student should be attending not less than 75% of total contact hours of the subject, otherwise he will not able to take exam and be considerd as an exam failure. If the student is absent due to illness, he/she should bring an approved statement from university Clinic.
2	**Tardy:** - For lateness in attending the class, the student will be initially notified. If he repeates late in attending class he will be considered absent.
3	**Exam Attendance/Punctuality:** - The student should attend the exam on time. He is permitted to attend the exam half one hour from exam beginning, after that he/she will not be permitted to take exam and he/she is considered absent in the exam.
4	**Assignments & Projects:** - In general one assignment is given after each chapter of a course. The student should submit the assignment on time, mostly one week after giving the assignment
5	**Cheating**: - For cheating in exam, the student is considered as failure. In case the cheating is repeated three times during study the student will be disengaged from the Faculty
6	**Plagiarism**: Plagiarism is the attending of the student the exam of a course instead of other student. If the examination committee proved a plagiarism of a student, he will be disengaged from the Faculty. The final disengagement of the student from the Faculty should be confirmed from the Student Affair Council of the university.
7	**Other policies:** - The mobile phone is not allowable to be used during class lecture. It must be switched off, otherwise the student will be ordered to leave the lecture room. - The mobile phone is not allowed to be taken during the examination time. - Lecture notes and assignments may be given directly to students using soft or hard copy.

Reviewed By	**Vice Dean for Academic Affairs and Post Graduate Studies** **Dr. Tarek A. Barakat** **Dr. Mohammad Algorafi**
	Deputy Rector for Academic Affairs Dr. Ibrahim AlMutaa **Dr. Ahmed mujahed** **Dr. Munaser Alsubri**

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Template for Course Plan (Syllabus)

I. Information about Faculty Member Responsible for the Course:							
Name of Faculty Member	Dr.thabet M. alghaberi	**Office Hours**					
Location& Telephone No.	Mobile (777791962)	**SAT**	**SUN**	**MON**	**TUE**	**WED**	**THU**
E-mail	Dr.ghaberythabit@gmail.com						

II. Course Identification and General Information:						
1-	**Course Title:**	***Mechanical Engineering Principles***				
2-	**Course Number & Code:**	ME121				
3-	**Credit hours:**	**C.H**				**Credit Hours**
		Th.	Tu.	Pr.	Tr.	
		2				**2**
4-	**Study level/year at which this course is offered:**	Second Level/ second semester				
5-	**Pre –requisite (if any):**	Non				
6-	**Co –requisite (if any):**	Non				
7-	**Program (s) in which the course is offered**	Civil Engineering				
8-	**Language of teaching the course:**	English /Arabic				
9-	**System of Study:**	Credit hours system				
10-	**Mode of delivery:**	Full Time				
11-	**Location of teaching the course:**	Faculty of engineering				

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IV. Intended learning outcomes (ILOs) of the course:

- Brief summary of the knowledge or skill the course is intended to develop**:**

a.1 Demonstrate knowledge and understanding of the Machines and equipment used in different engineering testing to Describe its Technical properties and relationships with civil engineering works and projects. A5

a.2 Define the Standards, cods and operation procedures of Technical equipment, systems and facilities used in buildings, installations and various civil engineering works and projects. A2.

b.1 Identify appropriate solutions engineering problems for engineering problems based on analytical thinking.B1.

b.2 Demonstrate skills in the evaluation and integration of theoretical information about mechanical engineering equipment and its practices and using in building and construction, works and different civil engineering projects. B3

c.1 Apply the experience and skills necessary to design, installation and operation of heating, cooling systems and technical facilities for civil engineering projects. C2

c.2 Use safely with the techniques and modern engineering equipment, machines and systems necessary for civil engineering works and project. C1

d.1 Work effectively as a member in a multi-disciplinary team.D3

d.2 Recognize the need to engage in life- long learning, and achieving effectively self-development. D5

V. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:				
Order	**Topics List**	**Sub Topics List**	**Week Due**	**Contact Hours**
1	First Part: Mechanical Engineering: Introduction: Definition of principles and foundations of mechanical and industrial engineering and importance of the course, goals, contents, applied and relationships with differences functions and projects of civil engineering.	Mechanical applied relationships in civil engineering, mechanical, thermal, equipment, machines, systems.	1	2
2	Civil engineering equipment and machinery mechanics used in building and construction works, projects, roads and concrete.	Equipment, machinery, mechanics, Civil engineering projects: construction, roads, concrete.	2	2
3	The patterns of mechanical movement and the forces affecting them.	The types of Mechanical movement, affecting forces.	3	2
4	Equipment and parts of movement, transmission and friction.	Movement parts, transmission, friction.	4	2
5	Kinematic diagrams and Describes of machines, equipment and its different parts.	Fundamentals parts of machines, equipment and systems Describing parts, kinematic diagrams,	5	2
6	Wrenches, scaffolding and metal structures used in civil engineering works and projects.	Wrenches, scaffolding and metal structures, compering, technology differences.	6	2
7	Types of equipment, machines and heavy mechanical means related to civil engineering works	Installation, Operation, systems, maintenance works, storage of heavy	7	2

	and projects (crushers - mixers - levers - concrete carriers - mills - hammers and drills - pumps).	mechanical equipment, machines used in civil engineering projects.		
8	Midterm Exam		8	2
9	Second Part Thermal Engineering: Principles of thermal, electrical and pneumatic systems.	Parts, contents, Installation, Operation, systems, maintenance works of thermal, electrical, and pneumatic used in civil engineering projects.	9-10	4
10	Principles of design, installation and operation of heating and cooling systems and technical facilities for civil engineering works.	Designing, Installation, Operation, systems, maintenance works of heating and cooling systems.	11	2
11	Concepts of design and installation of electrical systems for different buildings.	Concepts of design and installation of electrical systems for different buildings.	12	2
12	Thermal insulation systems for buildings, walls and ovens.	Thermal insulation systems parts, Engineering materials and properties.	13	2
13	The modern Technical facilities and systems necessary for buildings, installations and various civil engineering projects.	Modern technology, Standards, cods, properties,	14-15	4
14	Final Exam		16	2
Number of Weeks /and Units Per Semester			**16**	**32**

VI. Teaching strategies of the course:

- Lectures & Examples
Tutorials and Problem solving
participation.
-Lectures & Class activity
Practical work at Class.
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