Course Specifications

Course Title:	**Mechanical Power Lab-2**
Course Code:	**ME494**
Program:	**Mechanical Engineering**
Department:	**Mechanical And Industrial Engineering**
College:	**Engineering**
Institution:	**Majmaah University Majmaah**

Table of Contents

A. Course Identification

1. Credit hours:	**1**
2. Course type	
a.	University ☐ College ☐ Department ☑ Others ☐
b.	Required ☐ Elective ☐
3. Level/year at which this course is offered:	Level 9 fifth year
4. Pre-requisites for this course (if any)**:**	**ME111**
5. Co-requisites for this course (if any)**:**	**None**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	24	80
2	**Blended**	Nil	Nil
3	**E-learning**	6	20
4	**Correspondence**	Nil	Nil
5	**Other**	Nil	Nil

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	**Lecture**	--
2	**Laboratory/Studio**	30
3	**Tutorial**	--
4	**Others** (specify)	--
	Total	30
Other Learning Hours*		
1	**Study**	--
2	**Assignments**	--
3	**Library**	--
4	**Projects/Research Essays/Theses**	--
5	**Others** (specify)	--
	Total	--

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

Experimental determination of thermal conductivity of the material by linear heat conduction method.
Experimental determination of thermal conductivity of the material by radial heat conduction method.
Test parameters of radiation heat transfer experiment
To demonstrate the principles of a vapour power cycle
To compare the heat transfer characteristics of free and forced convection
To study two stroke and four stroke petrol engines.

2. Course Main Objective

- Be able to measure the fluid properties
- Be able to use the common instruments used in measuring pressures and flow rates in static and dynamic fluid systems
- To develop an understanding of the physics of heat transfer by convection and radiation.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge:**	
1.1	Memorize to operate linear heat conduction devices	a
1.2	Memorize to operate heat transfer measuring devices	b
2	**Skills :**	
2.1	Determine heat transfer	k
2.2	Study Two and Four stroke engines	b
2.3	Determine thermal Conductivity	a
3	**Competence:**	
3.1	Justify ideas develop and sharing them with others in team works (interpersonal skills).	k
3.2	Time management (Responsibility)	c

C. Course Content

No	List of Topics	Contact Hours
1	Introduction	6
2	First experiment	4
3	Second experiment	4
4	Third experiment	4
5	Fourth experiment	4
6	Fifth experiment radial heat transfer	4
7	Sixth experiment linear heat transfer	4
Total		30

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge**		
1.1	Memorize to heat transfer process	· Lectures and laboratory · Assignments, at home · Discussions in the Class	Quizzes: to assess understanding of mechanics of fluid and Heat Transfer - Assignments. - Midterm Exams. - Final Exam: to assess understanding the fluid mechanics.
1.2	Memorize to operate heat transfer measuring devices	· Lectures and laboratory · Assignments, at home · Discussions in the Class	Quizzes: to assess understanding of mechanics of fluid and Heat Transfer - Assignments. - Midterm Exams. - Final Exam: to assess understanding the fluid mechanics
2.0	**Skills**		
2.1	Determine heat transfer	Lectures and laboratory	Quizzes to assess problems analysis and solving.
2.2	Determine performance of power cycle	Assignments, at home	Case Study Report. Discussion Groups.
2.3	Determine thermal Conductivity	Discussions in the Class	Final Exam
3.0	**Competence**		
3.1	Justify ideas develop and sharing them with others in team works (interpersonal skills).	Class discussions: enable students to learn how to share ideas	Homework and Assignments Assessment of the laboratory reports
3.2	Time management (Responsibility)	Assigning homework with deadlines: Encourage students to manage their free time	Grading homework assignments

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	First experiment	Weekly	10
2	Second experiment	Weekly	10
3	Third experiment	Weekly	10
4	Fourth experiment	Weekly	10
5	Fifth experiment radial heat transfer	Weekly	10
6	Sixth experiment linear heat transfer	Weekly	10
7	Final Exam	Last Week	40

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student

consultations and academic advice : Two contact hours per week. □ Meeting with the students during the office hours (8-10 hr each week). □ Communicate by email. □ Communicate by Black Board

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Lab Manuals
Essential References Materials	Lab Manuals
Electronic Materials	(Lecture material in PPT)
Other Learning Materials	Scientific journals in the area (give exact titles)

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Lecture Room equipped with White Board, Data Show, and Overhead projector. Smart board
Technology Resources (AV, data show, Smart Board, software, etc.)	a- Laptop b- projector system
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Fluid Mechanics lab

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Student Feedback on Effectiveness of Teaching	Students Survey-Course evaluation Students survey- Instructor evaluation	Indirect Assessment
Evaluation of Teaching	Course Report Evaluation through Quizzes results Evaluation through Mid-term exams results] Use of questioners at the end of the semester to assess the instructor	Direct Assessment
Improvement of Teaching	Preparing the course file.	Direct assessment

Evaluation Areas/Issues	Evaluators	Evaluation Methods
	Preparing course report by the end of each semester. Acting on the results of the surveys and questioners. Adding new experiments to the course. Scientific Films in the web site related to the course subject	
Student Achievement	Comparison of student performance with those of previous years. Check marking by an independent faculty member of a sample of student work, Providing samples of all assessment material in course portfolio	Indirect Assessment

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Department Council
Reference No.	1/34/9767
Date	25/2/1432H