The University of Jordan
School of Engineering

Department	Course Name	Course Number	Semester
Mechanical Engineering	Heat Transfer II	0904542	

2019 Course Catalog Description

Review of basic concepts, radiation properties and processes, radiation exchange among surfaces, two dimensional steady state conduction, analytical, graphical, and numerical solutions, one-dimensional transient conduction, topics in convective heat transfer, exact and approximate problem solutions, combined entry length solution in pipe flow, heat transfer in turbulent and high speed flows, liquid metal heat transfer, freezing, melting, heat-pipe heat transfer, multimode heat transfer.

Instructors

Name	E-mail	Sec	Office Hours		Lecture Time	

Text Books

	Text book 1	Text book 2
Title	Fundamentals of Heat and Mass Transfer	
Author(s)	Incropera, DeWitt, Bergman and Lavine	
Publisher, Year, Edition	John Wiley, 2011, 7th.ed., SI Units	

References

Books	Hollman, J. P. Heat Transfer, 10th Edition. McGraw-Hill
Journals	International Journal of Heat and Mass Transfer
Internet links	

Prerequisites

Prerequisites by topic	-
Prerequisites by course	Heat Transfer (1) 0904441
Co-requisites by course	-
Prerequisite for	-

Topics Covered

Week	Topics	Chapter in Text	Sections
1-2	Introduction: Review of basic topics.	3, 5, 12	3.4, 3.5, 5.1, 12.1
3-4	Multi-dimensional steady-conduction.	4	4.1, 4.2,4.4, 4.5
5	Multi-dimensional transient conduction.	5	5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9, 5.10*
6-7	Free convection heat transfer.	9	9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9
8-9	Boiling and condensation.	10	10.2, 10.3, 10.4, 10.5, 10.6, 10.7, 10.8, 10.9, 10.10, 10.11
12-13	Radiation processes and properties.	12	12.2, 12.3, 12.4, 12.5, 12.6, 12.7, 12.8, 12.9
14-15	Radiation heat transfer between surfaces.	13	13.1, 13.2, 13.3, 13.4, 13.5, 13.6

Mapping of Course Outcomes to ABET Student Outcomes

SOs	Course Outcomes

1	1.Identify multi-dimensional modes of heat transfer. 2.Study free convection heat transfer. 3.Understand boiling and condensation heat transfer. 4.Analyze radiation processes and properties.

Evaluation

Assessment Tools	Expected Due Date	Weight
Assignments		10 %
Project		10 %
Midterm exam		30 %
Final exam		50 %

Contribution of Course to Meet the Professional Components

The course contributes to building the skills of solving problems of heat transfer evaluation, selection of basic components and dealing with engineering codes of heat transfer equipment.

Relationship to Student Outcomes

SOs	1	2	3	4	5	6	7
Availability	X						

Relationship to Mechanical Engineering Program Objectives (MEPOs)

MEPO1	MEPO2	MEPO3	MEPO4	MEPO5

ABET Student Outcomes (SOs)

1	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3	An ability to communicate effectively with a range of audiences
4	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5	An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Updated by ABET Committee, 2021