جامعة الإسراء
ISRA UNIVERSITY

COURSE Syllabus*According*

Course Name: Heat Transfer

Course Number: 04083242

General Course Information:

Course title	Heat Transfer
Course number	04082342
Credit hours	(3Hrs Theory, 0 practical)
Contact hours	(3Hrs in three times weekly)
Prerequisites/corequisites	Thermodynamics 0408304
Academic Program	Renewable Energy Engineering
Program code	REE
Awarding institution	Isra University
Faculty	Engineering
Department	Renewable Energy Engineering
Level of course	3rd Year
Academic year /semester	2nd Semester 2021-2022
Awarded qualification	B. Sc.
Other department(s) involved in teaching the course	-
Language of instruction	English
Date of production/revision	29 Mar 2022

Course Coordinator:

Coordinator'sName: Dr. Ismail Hdaib
Office No.: 4210
Office Phone: 2486
Office Hours: Su. 13.00 – 14.00
Email: ismail.hdaib@iu.edu.jo

Other Instructors:

Instructor'sName:
Office No.:
Office Phone:
Office Hours:
Email:

Course Description*(English/Arabic)*:

English	Heat Transfer: (3 semester hours) Lecture course. Understanding basic principles of Heat Transfer modes, (Conduction, Convection, and Radiation), Studying Energy Balance of Heating and Cooling processes, and learning techniques of heat transfer processes and applications solutions.
Arabic	نقل الحرارة: (3 ساعات فصلية دراسية) محاضرات فصلية. فهم المبادئ الأساسية لأنماط نقل الحرارة (التوصيل والحمل والإشعاع) ، ودراسة توازن الطاقة لعمليات التدفئة والتبريد ، وتعلم تقنيات عمليات نقل الحرارة وحلول التطبيقات.

Text Book: *Author(s), Title, Publisher, Edition, Year, Book website.*

Fundamentals of Heat and Mass Transfer– 7th Edition. Theodore L. Bergman, Adrienne S. Lavine, Frank P. Incropera, David P. DeWitt, John Wiley & Sons, Inc., Copyright © 2011 - ISBN : 13- 978-0470-50197-9

References: *Author(s), Title, Publisher, Edition, Year, Book website.*

Handbook of Heat Transfer, 3rd Edition - Warren M. Rohsenow, James R Hartnett, Young I. Cho, McGraw-Hill, New York, NY 10011, Copyright © 1998 - ISBN : 0-07-053555-8.

Course Educational Objectives (CEOs):

1.	Implement the various Heat Transfer Techniques – based problem solving for specific applications.
2.	Develop a sense of underlying physical mechanism and a mastery of solving practical problems an engineer is likely to face in the real world.
3.	Analysis Thermal Engineering Problems activities.
4.	Understand Energy Analysis and Efficiency.

IntendedLearning Outcomes (ILO's):

	Intended Learning Outcomes (ILO's)	**Relationship to CEOs**	**Contribution to PLOs**
A	**Knowledge and Understanding:**		
A1	Define basic concepts of Heat Transfer and basic terms in Thermal Energy Balance and Energy Analysis.	1, 2, 3	1, 2
A2	Describe and understand Modes of Heat Transfer (Conduction, Convection and Radiation).	2, 3, 4	1, 2
B	**Intellectual skills:**		
B1	Discuss Methods of Solving Steady State and Transient Conduction Heat Transfer Problems.	1, 2, 3	1, 2
B2	Identify Correlations of Convection Heat Transfer in External Flow cases and Internal Flow Applications.	1, 2, 3	1, 2
C	**Subject specific skills:**		
C1	Study the Free Convection Heat Transfer Correlations.	2, 3, 4	1, 2
C2	Determine the Heat Exchangers Theory and Applications in Industry.	2, 3, 4	1, 2

Weekly Schedule *(please chose the type of teaching)*

☐*(**3 hrs**Face – To - Face)*

☐*(**2 hrs**Face – To - Face**+1 hr** Asynchronous)* **(Hybrid)**

☐*(**3 hrs**Online)*

Week	First Hour (……..)	Second Hour (……..)	Third Hour (……..)	Ach. ILOs	Ach. PLOs	Descriptors*
1	Introduction	Introduction	Introduction	A1	1,2	K
2	Introduction to Conduction	Introduction to Conduction	Introduction to Conduction	A1,A 2	1,2	K
3	Introduction to Conduction	Introduction to Conduction	Introduction to Conduction	A1,A 2	1,2	S
4	One Dimensional, Steady State Conduction	One Dimensional, Steady State Conduction	One Dimensional, Steady State Conduction	A2,B1	1,2	S
5	One Dimensional, Steady State Conduction	One Dimensional, Steady State Conduction	One Dimensional, Steady State Conduction	A2,B1	1,2	S
6	One Dimensional, Steady State Conduction	One Dimensional, Steady State Conduction	One Dimensional, Steady State Conduction	A2,B1	1,2	S
7	Transient Conduction	Transient Conduction	Transient Conduction	A2,B1	1,2	S
8	Transient Conduction	Transient Conduction	Transient Conduction	A2,B1	1,2	S
9	Revision & Midterm Exam	Revision & Midterm Exam	Revision & Midterm Exam		1,2	C
10	External Flow	External Flow	External Flow	B2	1,2	S
11	External Flow	External Flow	External Flow	B2	1,2	S
12	Internal Flow	Internal Flow	Internal Flow	B2	1,2	K
13	Internal Flow	Internal Flow	Internal Flow	B2	1,2	K
14	Free Convection	Free Convection	Free Convection	C1	1,2	K
15	Heat Exchangers	Heat Exchangers	Heat Exchangers	C2	1,2	K
16	Final exam	Final exam	Final Exam		1,2	C

* **K: Knowledge, S: Skills, C: Competency**

Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

- **(3 hrs Face – To - Face)**
- **(2 hrs. Face – To - Face +1 hr Asynchronous) (Hybrid)**
- **(3 hrs Online)**
- **Course Videos**
- **Practice Labs**
- **Discussion Forums**
- **Quizzes**
- **Other Interactive online activities**

Course Policies:

A- Attendance policies:

The maximum allowed absences is 15% of the lectures.

B- Absences fromexams andhandingin assignmentson time:

Midterm exam can be retaken based on approval of excuse by the instructor's discretion.

Not handing assignment on time will incur penalties.

C- Academic Health and safetyprocedures

D- Honesty policy regarding cheating, plagiarism, and misbehaviour:

Cheating, plagiarism, misbehaviourwill result in zero grade and further disciplinary actionsmay be taken.

E- Grading policy:

- All homework isto be postedonline through the e-learning system.
- Exams will be marked within 72 hours and the marked exam papers will be handed to the students.
- Online Activities (Course Videos, Practice labs, Discussion Forums, Quizzes)**20%**
- Midterm**30%**
- Final Exam **50%**

F- Available university services that support achievement in the course:**E-Learning Platform, Labs, Library.**

Required equipment:

- **PC / Laptop with webcam and mic**
- **Internet Connection**
- **Access to Online Compiles such as:**
  Access to the IU E-Learning Platform at: https://elearn.iu.edu.jo/

Assessment Toolsimplemented in the course:

Final Exam
Midterm Exam
Quizzes
Practice Labs
Discussion Forums

Program Learning Outcome (PLOs):

Program Learning Outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviours that students acquire as they progress through the program. A graduate of the (_____) program will demonstrate		Bloom Taxonomy Levels*
a	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	1
b	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
c	An ability to communicate effectively with a range of audiences.	3
d	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.	4
e	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.	2
f	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.	2
g	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	3

***Bloom Taxonomy Levels**

Level#	1	2	3	4	5	6
Level Name	Knowledge	Comprehension	Application	Analysis	Evaluation	Synthesis

Responsible Persons and their Signatures:

Course Coordinator	**Dr. Ismail Hdaib**	**Completed Date**	**29/3/2022**
		Signature	

Received by (Department Head)	**Dr.Zakarya Al Omary**	**Received Date**	**29/3/2022**
		Signature	