DEPARTMENT OF MECHANICAL AND INDUSTRIAL ENGINEERING
MECHANICAL ENGINEERING PROGRAM, BSC.

Course Syllabus

1. **Course number and name**
   ME 455 Heat Transfer

2. **Credits and contact hours**
   (3+0) 3 credit hours, 3 contact hours

3. **Course type**
   Blended Learning Course (2+1)

4. **Instructor's or course coordinator's name**
   Eng. Dia' A. Afaneh

5. **Textbook information**
   Fundamentals of Heat and Mass Transfer-7th edition-(Theodore L. Bergman, Adrienne S. Lavine, Frank P. Incropera, and David P. Dewitt
   ISBN-13: 978-0470917855

   a. **Other supplemental materials**
      Instructor's Notes

6. **Specific course information**
   a. **Catalog description**
      Steady state conduction, Convection, and Radiation. Transient heat transfer. External and internal forced convection. Free convection, Boiling and Condensation. Introduction to Radiation.

   b. **Prerequisites or co-requisites**
      Prerequisite: ME 341 Fluid mechanics .

   c. **The course is:**
      Required in Mechanical Engineering Department.

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7. Specific goals for the course

a. Course outcomes:

After completion of the course, students are expected to be able to:

1. Identify the mode of heat transfer for a given application.
2. Provide students with the fundamental principles of heat transfer.
3. Apply the heat transfer principles for various aspects of actual heat transfer applications.
4. Use the basic theoretical calculations of heat transfer by using the required thermal properties of the working fluid.
5. Ability to calculate or estimate values of local and average heat transfer coefficients for various applications.

b. The following student outcomes are addressed by the course:

SO-(e) an ability to identify, formulate and solve engineering problems.
SO-(j) knowledge of contemporary issues
SO-(pc-2) prepares students to work professionally in thermal systems.

8. Learning Outcomes and their Alignment with Program Educational Objective (PEO's), Methods of Delivery, and Assessment Methods:

Learning Outcomes	Program PEOs	Method of Delivery	Assessment Method
Course Outcomes			
Identify the mode of heat transfer for a given application.	-	Lectures (Example and Problems)	Question in exam
Provide students with the fundamental principles of heat transfer.	-	Lectures (Example and Problems)	Question in exam
Apply the heat transfer principles for various aspects of actual heat transfer applications.		Lectures (Example and Problems)	Question in exam
Use the basic theoretical calculations of heat transfer by using the required thermal properties of the working fluid.	-	Lectures (Example and Problems)	Question in exam

Ability to calculate or estimate values of local and average heat transfer coefficients for various applications.	-	Lectures (Example and Problems)	Question in exam
Student Outcomes			
SO-(e) an ability to identify, formulate and solve engineering problems.			
SO-(j) knowledge of contemporary issues			
SO-(pc-2) prepares students to work professionally in thermal systems.			

9. Weekly Teaching Plan

Week No.	Lecture	Topic	Method of Delivery
1	Sun (9-10)	Chapter 1: Introduction	Lecture
	Tue (9-10)	Chapter 1: Introduction	Lecture
	Thu (9-10)	Chapter 1: Introduction	Asynchronous active learning
2	Sun (9-10)	Chapter 2: Introduction to Conduction.	Lecture
	Tue (9-10)	Chapter 2: Introduction to Conduction.	Lecture
	Thu (9-10)	Chapter 2: Introduction to Conduction.	Online Lecture
3	Sun (9-10)	Chapter 3: One-Dimensional, Steady-State Conduction	Lecture
	Tue (9-10)	Chapter 3: One-Dimensional, Steady-State Conduction	Lecture
	Thu (9-10)	Chapter 3: One-Dimensional, Steady-State Conduction	Online Lecture
4	Sun (9-10)	Chapter 3: One-Dimensional, Steady-State Conduction	Lecture
	Tue (9-10)	Chapter 3: One-Dimensional, Steady-State Conduction	Lecture
	Thu (9-10)	Chapter 3: One-Dimensional, Steady-State Conduction	Online Lecture
5	Sun	Chapter 3: One-Dimensional, Steady-State Conduction	Lecture

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	(9-10)		
	Tue (9-10)	Chapter 3: One-Dimensional, Steady-State Conduction	Lecture
	Thu (9-10)	First Exam	Exam
6	Sun (9-10)	Chapter 5: Transient Conduction	Lecture
	Tue (9-10)	Chapter 5: Transient Conduction	Lecture
	Thu (9-10)	Chapter 5: Transient Conduction	Online Lecture
7	Sun (9-10)	Chapter 5: Transient Conduction	Lecture
	Tue (9-10)	Chapter 5: Transient Conduction	Lecture
	Thu (9-10)	Chapter 5: Transient Conduction	Online Lecture
8	Sun (9-10)	Chapter 6: Introduction to Convection	Lecture
	Tue (9-10)	Chapter 6: Introduction to Convection	Lecture
	Thu (9-10)	Chapter 6: Introduction to Convection	Online Lecture
9	Sun (9-10)	Chapter 7: External Flow	Lecture
	Tue (9-10)	Chapter 7: External Flow	Lecture
	Thu (9-10)	Chapter 7: External Flow	Online Lecture
10	Sun (9-10)	Chapter 7: External Flow	Lecture
	Tue (9-10)	Chapter 7: External Flow	Lecture
	Thu (9-10)	Chapter 7: External Flow	Online Lecture
11	Sun (9-10)	Chapter 7: External Flow	Lecture
	Tue (9-10)	Chapter 7: External Flow	Lecture
	Thu (9-10)	Second Exam	Exam
12	Sun (9-10)	Chapter 8: Internal Flow	Lecture

	Tue (9-10)	Chapter 8: Internal Flow	Lecture
	Thu (9-10)	Chapter 8: Internal Flow	Asynchronous active learning
13	Sun (9-10)	Chapter 8: Internal Flow	Lecture
	Tue (9-10)	Chapter 8: Internal Flow	Lecture
	Thu (9-10)	Chapter 8: Internal Flow	Asynchronous active learning
14	Sun (9-10)	Chapter 9: Free Convection	Lecture
	Tue (9-10)	Chapter 9: Free Convection	Lecture
	Thu (9-10)	Chapter 9: Free Convection	Asynchronous active learning
15	Sun (9-10)	Chapter 10: Boiling and Condensation	Lecture
	Tue (9-10)	Chapter 10: Boiling and Condensation	Lecture
	Thu (9-10)	Chapter 10: Boiling and Condensation	Asynchronous active learning

10. Grade Distribution:

Assessment	Grade	Date
- First Exam	20%	Fifth Week
- Second Exam	20%	10th Week
- Assignments	10%	
- Final Examination	50%	16th Week

* Make-up exams will be offered for valid reasons. It may be different from regular exams in content and format.