جامعة الملك عبدالله
للعلوم والتقنية
King Abdullah University of
Science and Technology

Course Syllabus: Heat and Mass Transfer - ME 242

Division	Physical Science and Engineering Division
Course Number	ME 242
Course Title	Heat and Mass Transfer
Academic Semester	Spring
Academic Year	2018/2019
Semester Start Date	01/27/2019
Semester End Date	05/23/2019
Class Schedule (Days & Time)	10:30 AM - 12:00 PM | Mon Wed

Instructor(s)

Name	Email	Phone	Office Location	Office Hours
Aamir Farooq	Aamir.Farooq@kaust.edu.sa	+966128082704	4217, 5, Al-Kindi (bldg. 5)	Monday and Wednesday: 1 - 3 pm

Teaching Assistant(s)

Name	Email

Course Information

Comprehensive Course Description	*What is heat transfer?* Thermal energy in transit due to a temperature gradient *Motivation*: Understand rates and modes of heat transfer; ability to design heat systems; use computational tools to solve hea transfer problems *Example Applications:* Energy-conversion devices (engines, fuel cells, turbines), combustion, integrated circuits, human biology
Course Description from Program Guide	Transport properties, conservation equations, conduction heat transfer, forced and natural convective heat and momentum transfer in laminar and turbulent flows, boundary layer concepts, thermal radiation and mass diffusion.
Goals and Objectives	-Advanced knowledge of conduction, convection and radiation. -Bounday layer concepts. -Mass transfer.
Required Knowledge	-Undergraduate thermodynamics -Undergraduate heat transfer
Reference Texts	-Heat Transfer by Nellis, Klein (Primary Textbook) -Heat Transfer by A.F. Mills -Fundamentals of Heat and Mass Transfer by Incropera, DeWitt, Bergman, Lavine
Method of evaluation	**5.00**% - Active participation **20.00**% - Course Project(s) **35.00**% - Final exam **20.00**% - Homework /Assignments **20.00**% - Midterm exam

Nature of the assignments	Assignments will involve solving problems related to the concepts covered during lectures. You will need to use some software, such as MATLAB, EES and FEHT.
Course Policies	-Collaborative discussion on homework is encouraged, but each student must do his/her own work. -Mobile phones cannot be used during lectures. -Active participation in class is necessary.
Additional Information	

Tentative Course Schedule *(Time, topic/emphasis & resources)*		
Week	**Lectures**	**Topic**
1	Mon 01/28/2019	Course introduction. 1-D steady-state conduction
1	Wed 01/30/2019	1-D steady-state conduction
2	Mon 02/04/2019	2-D steady-state conduction
2	Wed 02/06/2019	2-D steady-state conduction
3	Mon 02/11/2019	2-D steady-state conduction
3	Wed 02/13/2019	2-D steady-state coduction
4	Mon 02/18/2019	Transient conduction
4	Wed 02/20/2019	Transient conduction
5	Mon 02/25/2019	Transient conduction
5	Wed 02/27/2019	Transient conduction
6	Mon 03/04/2019	External forced convection
6	Wed 03/06/2019	External forced convection
7	Mon 03/11/2019	External forced convection
7	Wed 03/13/2019	External forced convection
8	Mon 03/18/2019	Review
8	Wed 03/20/2019	Mid-term exam
9	Mon 03/25/2019	Spring break
9	Wed 03/27/2019	Spring break
10	Mon 04/01/2019	Internal forced convection
10	Wed 04/03/2019	Internal forced convection
11	Mon 04/08/2019	Internal forced convection
11	Wed 04/10/2019	Internal forced convection
12	Mon 04/15/2019	Natural convection
12	Wed 04/17/2019	Natural convection
13	Mon 04/22/2019	Boiling and condensation
13	Wed 04/24/2019	Boiling and condensation
14	Mon 04/29/2019	Radiation heat transfer
14	Wed 05/01/2019	Radiation heat transfer
15	Mon 05/06/2019	Radiation heat transfer
15	Wed 05/08/2019	Radiation heat transfer
16	Mon 05/13/2019	Mass transfer
16	Wed 05/15/2019	Mass transfer
17	Mon 05/20/2019	Final Exam Week
17	Wed 05/22/2019	Final Exam Week

Note

The instructor reserves the right to make changes to this syllabus as necessary.