

## Flow up of implementation celli pass play

Course Instructor	Jasim Mohammed				
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Title	Assistance Professor				
Course Coordinator	Annually				
Course Objective	<b>This module aims to:</b> <b>1. Familiarize the students with the three basic forms of heat transfer</b> <b>2. Introduce the students to the basic concepts of steady state and transient</b>				
CourseDescription	<b>Upon the completion of this module, the student will be able to:</b> <b>1. Understand principles of conductive, convective, and radiative heat transfer</b> <b>2. Apply the above heat transfer principles to solve practical engineering problems</b> <b>3. Integrate knowledge on mass, momentum, heat transfer, and thermodynamics</b> <b>4. Apply the above integrated knowledge to solve practical engineering problems</b> <b>5. Apply the basics of heat transfer to engineering design</b>				
Textbook	Heat Transfer, by J. P. Holman, 10 <sup>th</sup> Edition, McGraw-Hill, 2010				
CourseAssessments	TermTests	Laboratory	Quizzes	Project	Final Exam
	30%	-	10%	-	60%
General Notes	Assignments and reports are required during both semesters				

Republic of Iraq  
Ministry of Higher Education  
&Scientific Research



University: Diyala  
College: Engineering  
Department: Mechanical  
Stage: Third  
Lecturer name: Jasim Mohammed  
Qualification: Ph.D Mechanical Engineering  
Place of work: University of Diyala

## CourseWeeklyOutline

Week	Date	Topes Covered	Lab. Experiment	Notes
1	2014/9/23	<b>Introduction</b> - General concepts and definitions - Heat conduction - Convective heat transfer - Thermal radiation		
2	2014/9/30	<b>Conduction heat transfer (general equation)</b> - General heat conduction equation - One-dimensional, steady state, conduction through plane wall		
3	2014/10/7	<b>Conduction heat transfer (1-D, steady state)</b> - Composed wall - Cylinder, composed cylinder - Sphere, composed sphere		
4	2014/10/14	<b>Conduction heat transfer (1-D, steady state, with heat generation) in</b> - Plane wall - Composed wall - Solid cylinder		
5	2014/10/21	- Hollow cylinder - Sphere - Critical thickness of insulation		
6	2014/10/28	<b>Heat transfer through extended surfaces (fins)</b> - General equation for temperature distribution - Very long fin - Short fin		
7	2014/11/4	- End insulated fin - Effectiveness of the fin - Applications		

8	2014/11/11	<b>2-D, Steady state heat conduction</b> - Analytical solution with different boundary conditions - Exact solution with different boundary conditions		
9	2014/11/18	<b>Unsteady state heat conduction</b> - Analytical solution for the unsteady state heat conduction equation (lumped system)		
10	2014/11/25	<b>Transient heat conduction in</b> - large plane walls, - long cylinders, - and spheres with spatial effects		
11	2014/12/2	<b>Numerical solution</b> - Numerical solution for one-D steady state heat conduction equation (nodes)		
12	2014/12/9	- Numerical solution for two-D steady state heat conduction equation (nodes)		
13	2014/12/16	<b>Convective heat transfer</b> - Fluid flow background - Laminar and turbulent flow - Boundary layer growth for external flow and internal flow		
14	2014/12/23	<b>Forced convection</b> - Energy equation - Thermal boundary layer and temperature distribution and heat transfer for: Laminar flow over flat plate		
15	2015/1/30	- Laminar flow through closed conduit - Empirical equation for cross flow for cylinder, sphere and tube bank - Empirical equation for turbulent flow		

**Half-year break**

16	2015/2/17	<b>Natural convection</b> - General concepts - Grashof number		
17	2015/2/24	Free convection for: Vertical plate and tube Horizontal plate and tube		
18	2015/3/3	<b>Thermal radiation</b> - Introduction to thermal radiation - The electromagnetic waves		
19	2015/3/10	- The black body - The shape factor		
20	2015/3/17	- Thermal radiation between: Two parallel plates (gray) Two concentric cylinder		
21	2015/3/24	Thermal radiation between more than two bodies - Thermal resistance network - Radiation shields		
22	2015/3/31	<b>Heat exchanger</b> - General concepts - Types of heat exchangers		
23	2015/4/7	- Heat exchangers performance by LMTD method - Heat exchanger's effectiveness. - NTU method		
24	2015/4/14	<b>Condensation and vaporization heat transfer on (vertical tube, horizontal tube, tube bank)</b> - Concepts of condensation		
25	2015/4/21	- Heat transfer due to condensation		
26	2015/4/28	- Empirical equation for condensation		
27	2015/5/5	<b>Boiling heat transfer</b> - H.T. due to boiling curve - Empirical equations for boiling		
28	2015/5/12	<b>Boiling heat transfer calculation (empirical equations)</b> - Calculation of heat transfer Coefficient		
29	2015/5/19	<b>Mass transfer</b> - General concepts - Mass transfer modes		
30	2015/5/26	<b>Reviewing</b>		

**INSTRUCTOR Signature:**

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