Republic of Iraq

The Ministry Of Higher Education

& Scientific Research

University: technology
College:
Department: material
Stage: 2nd year
Lecturer name: Dr Ayad K. Hassan
Qualification:
Place of work:

Flow up of implementation celli pass play

Course Instructor	Ayad K. Hassan				
E-mail	ayad_kadhm@yahoo.com				
Title	Heat transfer and fluid				
Course Coordinator	MaE 216 Heat Transfer and Fluid				
Course Objective	This course provides an intermediate level coverage of thermal transport processes via conduction, convection, and radiation heat transfer. This course stresses fundamental engineering science principles applied to engineering thermal analysis. Students will learn to apply the conservation of energy to control volumes and express the conservation of energy through mathematical formulations, including both steady state and transient analyses, with emphasis on the fundamental physics and underlying mathematics associated with heat transfer. Upon completion of this course, students are expected to understand basic heat transfer problem formulation and solution techniques, coupled with a strong foundation and appreciation for the physics of heat transfer.				
Course Description	Introduction to the concepts of conduction, convection, and Radiation heat transfer. Application of these concepts to engineering problems				
Textbook	**Textbook:** *Fundamentals of Heat and Mass Transfer* by F.P. Incropera, D. P. Dewitt, T.L. Bergman, and A.S. Lavine, John Wiley, 6th Ed., 2007. **References:** **1.** Heat Transfer-Professional Version by L. C. Thomas, Capstone PC, 2nd Ed., 1999. **2**. Heat Transfer by Y.A. Cengel, McGraw-Hill, 3rd Ed., 2007.				
Course Assessments	Term Tests	Laboratory	Quizzes	Project	Final Exam
	As(30%)	As(10%)	As(10%)		As(50%)
General Notes					

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بسم الله الرحمن الرحيم

University:
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Course Weekly Outline

week	Date	Topes Covered	Lab. Experiment Assignments	Notes
1		Introduction: Basic modes of heat transfer, conservation of energy		
2		Physical Origins and Rate Equations Conduction Convection Radiation		
3		The Conservation of Energy Requirements • Conservation of energy for a control volume • The Surface Energy Balance		
4		INTRODUCTION TO CONDUCTION • The Conduction Rate Equation • The Thermal Properties of Matter		
5		• The Heat Diffusion Equation • Boundary and Initial Conditions		
6		ONE-DIMENSIONAL, STEADY-STATE CONDUCTION • Plane wall • Thermal Resistance • the Composite Wall Contact Resistance		
7		**Radial Systems** • **The Cylinder** • Critical radius		
8		**The Sphere** • Critical radius		
9		**TWO-DIMENSIONAL, STEADY-STATE CONDUCTION**		
10		• Finite-Difference Equations		

11		• The Nodal Network • Finite-Difference Form of the Heat Equation		
12		• The Energy Balance Method		
13		**TRANSIENT CONDUCTION**		
14		* The Lumped Capacitance Method		
15		*Validity of the Lumped Capacitance Method		
16		* General Lumped Capacitance Analysis		
Half – year break				
17		**INTRODUCTION TO CONVECTION** • The Convection Boundary Layers		
18		• The Velocity Boundary Layer • The Thermal Boundary Layer		
19		• Local and Average Convection Coefficients • Laminar and Turbulent Flow		
20		• The Boundary Layer Equations Boundary Layer Similarity		
21		EXTERNAL FLOW • The Empirical Method		
22		• The Flat Plate in Parallel Flow • Laminar Flow over an Isothermal Plate • Turbulent Flow over an Isothermal Plate		
23		• Mixed Boundary Layer Conditions • Unheated Starting Length Flat Plates with Constant Heat Flux Conditions		
24		• Methodology for a Convection Calculation • The Cylinder in Cross Flow The Sphere in Cross Flow		
25		INTERNAL FLOW • Hydrodynamic Considerations Flow Conditions		
26		• The Mean Velocity • Velocity Profile in the Fully Developed Region		
27		• Pressure Gradient and Friction		

		Factor in Fully Developed Flow • Thermal Considerations The Energy Balance		
28		**RADIATION: PROCESSES AND PROPERTIES** • Fundamental Concepts • Radiation Intensity • Blackbody Radiation • Emission from Real Surfaces		
29		• Absorption, Reflection, and Transmission by Real Surfaces		
30		• Kirchhoff's Law • The Gray Surface		
31		**RADIATION EXCHANGE BETWEEN SURFACES** • The View Factor		
32		• Thermal radiation, blackbody radiation, radiation properties		

Instruction Signature: Dean Signature:

جمهورية العراق

وزارة التعليم العالي والبحث العلمي

جهاز الاشراف والتقويم العلمي

بسم الله الرحمن الرحيم

وزارة التعليم العالي والبحث العلمي
Ministry of Higher Education & Scientific Research

اسم الجامعة: التكنولوجية
اسم الكلية: هندسة المواد
اسم القسم:هندسة المواد
المرحلة: الثانية
اسم المحاضر الثلاثي:د اياد كاظم حسن
اللقب العلمي:مدرس
المؤهل العلمي: دكتوراه
مكان العمل:الجامعة التكنولوجية –قسم هـ المواد

استمارة انجاز الخطة التدريسية للمادة

الاسم	
البريد الالكتروني	
اسم المادة	
مقرر الفصل	

اهداف المادة					
التفاصيل الاساسية للمادة					
الكتب المنهجية					
المصادر الخارجية					
تقديرات الفصل	الفصل الدراسي	المختبر	الامتحانات اليومية	المشروع	الامتحان النهائي
	مثلاً35%	مثلاً15%	مثلاً10%		مثلاً40%
معلومات اضافية					

جمهورية العراق

وزارة التعليم العالي والبحث العلمي

جهاز الاشراف والتقويم العلمي

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Ministry of Higher Education & Scientific Research

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اسم القسم:
المرحلة:
اسم المحاضر الثلاثي:
اللقب العلمي:
المؤهل العلمي:
مكان العمل:

استمارة الخطة التدريسية للمادة

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توقيع الاستاذ: توقيع العميد: