



AL IMAM MOHAMMAD IBN SAUD ISLAMIC UNIVERSITY
COLLEGE OF ENGINEERING
Department of Mechanical Engineering

Course Information

Course Code and Name:	ME421 Design and Analysis of Thermal Systems
Credit Hours:	3 (3 Lecture + 1 Tutorial)
Prerequisites:	ME 323 Thermodynamics 2

Course Description

Application of energy concepts to thermal fluid design problems. Modeling and optimization of thermal systems with a focus on heat-pumping equipment, such as vapor compression, absorption, and some advanced heat-pumping cycles. Students combine the use of thermodynamics, heat transfer, fluid mechanics, and numerical methods to develop and apply mathematical models for the analysis and optimization of specific equipment.

Textbook

Title	Analysis and Design of Energy System		
Authors	B.K. Hodge, R.P. Taylor		
Publisher	Pearson	Year and Edition	1999, 3 rd Edition

Course Contents

Introduction to thermal design: Example Design problems Safety and reliability – Concept creation and assessment -Computer-aided thermal system design- System design Concept.

Heat Exchangers: Design, modelling and calculation

Basic modeling techniques of Thermal Systems

Problem Formulation for Optimization

Integrated system design project that may include heat exchangers and heat recovery systems, power generation and cogeneration, combusting systems, renewable energy conversion devices, hydraulic systems.

Academic Coordinator	Signature
Dr. Syed Muhammad Fakhir Hasani	

Official Stamp

