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

Course Information	
Course Code and Name:	ME444 Gas Turbine Engines (Elective)
Credit Hours**:**	**3 (**3 Lecture + 1 Tutorial)
Prerequisites:	ME323 Thermodynamics-II

Course Description
Basic operating principles and analysis of performance characteristics of gas turbine engines for aircraft, vehicular propulsion and stationary power. Turbojet, turbofan, turboprop cycle analysis. Analysis of flow through compressors, turbines, combustors, inlets, nozzles and regenerators. Component matching and off-design performance.

Textbook			
Title	Gas Turbine Theory		
Authors	H. Cohen, G.F.C. Rogers and H.I.H. Sarawanamuttoo		
Publisher	Pearson (USA)	Year and Edition	2009, 6th edition

Course Contents
Introduction: Single and twin-shaft arrangements, compounding, open and closed cycles, electricity generation and aircraft propulsion
Shaft Power Cycles: Ideal cycles, methods of accounting for component losses, design point performance calculations, comparative performance of ideal cycles.
Aircraft Propulsion Cycles: Performance criteria, intake and propelling nozzle efficiencies. Turbojet, turbofan and turboprop engines.
Centrifugal Compressors: Theory and principle of operation of centrifugal compressors. Work and pressure rise calculations in the impeller. Pressure calculations in the diffuser and design of the volute casing.
Axial Flow Compressors: Elementary theory, degree of reaction, three dimensionality of flow, simple design method.
Axial Flow Turbines: Elementary and vortex theory, blade design, choice of blade profiles, estimation of stage and overall turbine performance.
Gas turbine materials, gas turbine combustion and auxiliary systems

Academic Coordinator	**Signature**
Dr. Syed Muhammad Fakhir Hasani	

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