

Department of Mechanical Engineering							
Course Code	Title of the course	Program Core (PCR) / Electives (PEL)	Total Number of contact hours				Credit
			Lecture (L)	Tutorial (T)	Practical (P) [#]	Total Hours	
MEO 741	Non-conventional Energy Systems	PEL	3	0	0	3	3
Pre-requisites		Course Assessment methods (Continuous (CT) and end assessment (EA))					
NA		CT+EA					
Course Outcomes	CO1: Identify and explain the use of non-conventional energy systems. CO2: Develop an understanding that solutions to energy-related problems are complex involving sociological, economic, political and technological considerations, decisions and development. CO3: Gain insight into the issues surrounding non-conventional energy sources development and use. CO4: Become knowledgeable about applications of non-conventional energy systems as they apply to commercial, residential and industrial markets.						
Topics Covered	Traditional energy systems, Sources, Features and characteristics, applications 2 Component of solar energy systems, Collector types and performances, Radiation and meteorological data processing, Long term conversion factors, System conversion and system design procedures, Solar power generation, Solar heating and cooling, Solar passive systems: Solar still, Pond, Greenhouse, Dryer, Trombe wall, Overhangs and Wing walls. 13 Wind energy conversion systems, Estimate of wind energy potential, Aerodynamic and mechanical aspects of wind machine design. 4 Principles and applications of wave energy, Shoreline systems, Near shore systems, Off shore systems 3 Tidal energy, Biomass energy, Operating principle, Wood gassifier, Pyrolysis, Applications, 4 Geothermal energy and OTEC. 4 Fuel cell: Types and technology status. 3 Hydel Power Plant: Introduction to hydro-electric power generation, Types of Hydel turbines, Layout and selection of turbines and installation, Geographic limitations, Turbine performance, Comparative analysis between thermal and hydel plants. 9						
Text Books, and/or reference material	Suggested Text Books: 1) Solar Energy Fundamentals and Applications-- Garg and Prakash 2) Solar Energy-- S. P. Sukhatme Suggested reference books: 1) Fundamentals of Renewable Energy Systems-- D. Mukherjee and S. Chakrabarti 2) Non-conventional Energy Sources-- D. S. Chauhan and S. K. Srivastava						

Department of Metallurgical and Materials Engineering							
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MMO 541	Basic Manufacturing Processes	PEL	3	0	0	3	3