

1.	Title of the course	Energy Conversion Systems
2.	Course number	ME401M
3.	Structure of credits	2-1-3-5
4.	Offered to	UG
5.	New course/modification to	Modification To ME4101/8
6.	To be offered by	Department of Mechanical Engineering
7.	To take effect from	July 2022
8.	Prerequisite	Nil
9.	<b>Course Objective(s):</b> To learn fundamentals of various energy conversion systems; To learn thermodynamic analysis of IC engine cycles and processes; To learn various subsystems in IC engines; To learn analysis of turbo machine processes and components, application of first and second laws of thermodynamics to turbomachines; To learn analysis of refrigeration cycles and components, types of refrigerants, concepts of super heating and sub-cooling .	
10.	<b>Course Content:</b> Evolution of IC engines; features of IC engines; Nomenclature; Classification; Construction and working of 2S, 4S, petrol and diesel engines; components of the IC engines, applications of IC engines; P-v diagrams; Details of the engine components, test parameters, combustion and emissions: Turbo Machines; Types, static and stagnation states and representation of expansion and compression processes in T-s/h-s plots, application of first and second laws of thermodynamics to turbomachines, velocity triangle, absolute and relative velocities, Euler equation for turbomachines, degree of reaction, losses and non-dimensional groups in turbomachines: Refrigeration- vapour compression refrigeration systems, review of refrigerants, actual cycles -superheating, sub-cooling; Lab component: Performance evaluation of CI and SI engines, performance study of pelton wheel, francis turbine, kaplan turbine and centrifugal pump, performance study of vapour compression refrigeration system and air conditioning system	
11.	<b>Textbook(s):</b> 1. Dixon S L and Hall C A, <i>Fluid Mechanics and Thermodynamics of Turbomachines</i> , 7th Edition, Butterworth-Heinemann (2010). 2. Stone R, <i>Introduction to Internal Combustion Engines</i> , 4th Edition, Palgrave Macmillan (2012).	
12.	<b>Reference(s):</b> 1. Arora C P, <i>Refrigeration and Air-conditioning</i> , 3rd Edition, Tata McGraw-Hill (2008). 2. Ganesan V, <i>Internal Combustion Engines</i> , 4th Edition, Tata McGraw-Hill (2003).	