No	Information of Every Subject		
1.	UnitName:Mechanical Engineering Fundamental		
2.	Unit Code: ME 31034		
3.	Classification: EngineeringSubject		
4.	CreditValue: 2.5		
5.	Semester/Year Offered : 1/3		
6.	Pre-requisite: Basic Engineering Thermodynamic		
7.	Mode of Delivery :Lecture, Tutorial		
8.	AssessmentSystemandBreakdown ofMarks:		
	Tutorial	30%	
	Mid-Term Exam	70%	
9.	AcademicStaff Teaching Unit:		
10.	Course outcome ofUnit: In this course, students will be able (1) To recognize the parameters and characteristics of thermodynamic systems. (2) To apply the steady-flow energy equation or the laws of Thermodynamics to a system of thermodynamics components (3) To apply ideal cycle analysis to simple heat engine cycles to estimate thermal efficiency and work as a function of pressure and temperature at various points in the cycle.		
11.	SynopsisofUnit: On completion of this unit, a student shall be able to: The course introduces students to the study of materials properties, types of loads and support condition. Course comprehends normal stresses, normal strain, shear stress, shear strain, shear force, bending moment, and bending stress in beams, and can be solved problems. And then, it can be applied in the engineer field such as industry and construction.		
12.	Topics and Contact Hours:		
	Topic	**Contact Hours**	
		Lecture	**Tutorial**

	1.1 Thermodynamics 1.2 Working substance 1.3 Substance 1.4 Temperature 1.5 Pressure 1.6 Volume 1.7 Process 1.8 Cycle 1.9 The constant temperature process 1.10 The constant pressure process 1.11 The constant volume process 1.12 Energy 1.13 Work 1.14 Work and the pressure-volume diagram 1.15 The polytropic process PV^n = constant 1.16 Work and the polytropic process 1.17 Work and the hyperbolic process 1.18 Internal energy 1.19 Heat	5	
	Systems 2.1 General introduction 2.2 Control volume 2.3 The conservation of energy 2.4 Energy forms in the thermodynamics systems 2.5 The closed system 2.6 The non-flow energy equation 2.7 The open system 2.8 The steady-flow energy equation 2.9 Continuity of mass flow	3	

	The laws of thermodynamics 3.1 introduction 3.2 The zeroth law 3.3 The first law of thermodynamics 3.4 The second law of thermodynamics 3.5 The third law of thermodynamics	2	
	Gases and single-phase system 5.1 General introduction 5.2 Boyle's law 5.3 Charles' law and also absolute temperature 5.4 The characteristic equation of a perfect gas 5.5 The internal energy of a gas and Joule's law 5.6 The specific heat capacities of a gas 5.7 The constant volume heating of a gas 5.8 The constant pressure heating of a gas 5.9 The difference of the specific heat capacities of a gas 5.10 The polytropic process and a gas	12	
	5.11 The combination of the polytropic law $PV^n = C$ and the characteristic equation of a perfect gas 5.12 The adiabatic process and a gas 5.13 The isothermal process and a gas 5.14 The non-flow energy equation and the polytropic law $PV^n = C$ General examples		

	Ideal gas power cycles 15.1 General introduction 15.2 The Carnot cycle for a gas 15.3 The constant pressure cycle 15.4 The constant volume cycle 15.5 The Diesel cycle 15.6 The duel combustion cycle	9	
13	Main Reference: **Basic Engineering Thermodynamics, 5th Edition, Rayner Joel, 2012**		