SAMRAT ASHOK TECHNOLOGICAL INSTITUTE

(Engineering College), VIDISHA M.P.

(An Autonomous Institute Affiliated to RGPV Bhopal)

Mechanical Engineering Department

Semester/Year		I	Program		B.Tech.
Subject Category	ESC	Subject Code:	**MEA-101**	Subject Name:	**Basic Mechanical Engineering**

Maximum Marks Allotted						Contact Hours			Total Credits
Theory			Practical		Total Marks				
End Sem	Mid-Sem	Quiz	End Sem	Lab-Work		L	T	P	
60	20	20	-	-	100	3	1	-	4

Prerequisites:(Only for open electives)

Course Objective:

This Subjects deals with the Basic Knowledge related to production such as casting, welding, joiningetc. After completing this subjects students are able to analyze the difference between variousmanufacturing techniques and solve the basic problem related to the subjects

Course Outcomes:

At the end of the course, the students will able to:

CO1: Understand the basic concept of Thermodynamics and working of Boilers and its accessories,evaluate the performance of boiler and properties of Steam.

CO2: Understand the properties of fluids.

CO3: Understand the basic Concepts of Internal Combustion Engines and its working.

CO4: Identify Engineering Materials, and its properties.

CO5: Familiar with renewable energy like solar, wind, tidal etc.

Contents:			
UNITs	Descriptions	Hrs.	CO's
I	**Thermodynamics:** Thermodynamic Systems, Properties, Cycles,Process. Zeroth law, First and second law of thermodynamics; steamproperties, steam processes at constant pressure, volume, enthalpy &entropy,Refrigeration: Vapour compression cycles, coefficient of performance(COP), refrigerant, properties, and eco-friendly refrigerants.	10	1
II	**Fluids:** Fluid properties, pressure, density and viscosity, pressurevariation with depth, static and kinetic energy, Bernoulli's equationfor incompressible fluids, viscous and turbulent flow, working principleof fluid coupling, Introduction of hydraulic turbine,pneumatic machines	8	2
III	**Internal Combustion Engines:** Otto and Diesel cycles; working of twostroke & four stroke petrol & diesel IC engines; pv-diagrams of fourstroke petrol and diesel engines (Actual & theoretical) Valvetiming diagrams, Efficiency: mechanical, thermal, Air standardefficiencies of Otto and Diesel Cycle, Simple Problems.	8	,3
IV	**Materials:** Classification of engineering material, Composition of castiron and carbon steels, Allotropic behaviour of iron,on iron-carbon diagram and their mechanicalproperties; Alloy steel and their applications; stress-strain diagram,Hooks law and modulus of elasticity, Tensile, shear, hardness andfatigue testing of materials	6	4
V	**Renewable Energy:** New and Renewable sources of Energy such asSolar Energy and its Principle, Solar Collectors, Solar Ponds.Wind Energy, Tidal Energy, and Geothermal Energy.Introduction to electric Vehicles (EVs) and their Principle.	8	5
Guest Lectures (if any)			
Total Hours: 40			
Suggestive list of experiments: (if any)			
Reference Books-			

1. Nag PK, Tripathi et al.; Basic Mechanical Engineering; TMH

2. Pravin Kumar; Basic Mechanical Engineering; Pearson

3. Agrawal B & CM; Basic Mechanical Engineering, Wiley India

4. Rajput RK; Basic Mechanical Engineering; LP

5. Nag PK; Engineering Thermodynamics, TMH

6. Ganeshan; Combustion Engines; TMH

7. Narula; Material Science, TMH

8. Sawhney GS; Fundamental of Mechanical Engineering; PHI

Modes of Evaluation and Rubric

There will be continuous evaluation for during the semester for 40 sessional marks and 60 semester End term Marks. The practical marks are 50, out of which 30 marks will be awarded for viva voce and 20 marks for lab work. Out of 40 sessional marks, 20 shall be awarded for Mid semester, 20 marks to be awarded for day to day performance and Quiz/Assignments. For the 60 Marks, there will be a semester – End examination as per the norms of AICTE.

Recommendation by Board of studies on	Date:
Approval by Academic council on	Date:
Compiled and designed by	Name 1.
Checked and approved by	Name 1.