Subject: **Basic Mechanical Engineering (Open Elective-I)**								
Program: **B. Tech All Branches (Except Mech.)**				Subject Code: **ME0118**		Semester: **I**		
Teaching Scheme				**Examination Evaluation Scheme**				
Lecture	**Tutorial**	**Practical**	**Credits**	**University Theory Examination**	**University Practical Examination**	**Continuous Internal (CIE) Evaluation Theory**	**Continuous Internal (CIE) Evaluation Practical**	**Total Marks**
2	0	2	3	16/40	16/40	24/60	24/60	200

Course Objectives:

1. To understand thermodynamic laws.
2. To identify best fuel and lubrication selection as per different working condition.
3. To apply gas laws and develop refrigeration principle in usable devices.
4. To generate steam as per required application and select boilers as per required working condition.
5. To apply Internal combustion engine working principle in practical application.
6. To select drive and transmission element as per working condition.

Course Outcomes:

After study this course student will be able

1. To know and learn thermodynamic properties and laws in practical engineering application.
2. To identify and select best fuels and lubricant from available.
3. To judge behaviors of gases and changing in its properties under different working condition.
4. To know working of home appliances like refrigeration, water cooler, and Air- conditioner.
5. To decide amount of heating need for generation of steam as per required application. To calculate amount of energy having in generated steam.
6. To identify and select boilers as per required working condition.
7. To select Internal Combustion engine (petrol and Diesel engine) as per function and power requirement.

COURSE CONTENT

UNIT-1 [05]

1 Basic Concepts of Thermodynamics

Basic units and dimensional analysis, Intensive and Extensive Properties, Energy, heat, temperature, specific heat capacity, Interchange of heat, change of state,

Internal energy, enthalpy, entropy, efficiency, Open and Closed systems, statements of Zeroth Law, First law& Second law of Thermodynamics

2 Fuels and Lubricants

Different types of fuels, their properties and applications. Different types of lubricants and applications.

UNIT-2 **[07]**

3 Properties of Gases

Ideal and Real Gases, Gas laws, Boyle's law, combined gas law, gas constant, Internal energy, Relation between C_p and C_v, Enthalpy, constant volume process, Constant pressure process, Isothermal process, polytropic process, Adiabatic process.

4 Refrigeration

Introduction, Refrigerant, Vapour compression system, Applications

UNIT-3 **[09]**

5 Properties of Steam

Introduction, steam formation, types of steam, enthalpy, specific volume of steam and dryness fraction of steam, Internal energy, steam tables, Measurement of dryness fraction throttling calorimeter, separating calorimeter.

6 Steam Boilers

Introduction, classification, Simple vertical and horizontal boiler, Boiler details, Boiler performance. Functioning of different mountings and accessories.

UNIT-4 **[09]**

7 Internal Combustion Engines

Classifications, Difference between I.C. and E.C., Otto four-stroke engine, Diesel-four-stroke engine, Difference between Otto cycle and Diesel engine, Two-stroke engines, Difference between two- stroke and four-stroke engines, indicated power (IP), Brake power (BP), Efficiencies.

8 Transmission of Motion and Power

Introduction, Couplings methods of drive, power transmission elements, shaft and axle, Belt-drive, pulleys, power transmitted by a belt, Chain drive, Friction drive, Gear drive.

Text Books:

1. Elements of Mechanical Engineering by P S Desai and S B Soni- Atul Prakashant
2. Elements of Mechanical Engineering by K.P. Roy and Prof. S.K. Hajra Chaudhary, Media Promoters and publishers Pvt. Ltd. Bombay
3. Elements of Mechanical Engineering by Sadhu Singh S. Chand Publication.

References:

1. Basic & Applied Thermodynamics by P K Nag - Tata McGraw Hill Pvt. Ltd.,

Mumbai
2. Basic Mechanical Engineering by Pravin Kumar, Pearson
3. Fundamental of Mechanical Engineering by G.S. Sawhney, PHI Publication

New Delhi

web Resources:

1. http://ronney.usc.edu/AME101/AME101-LectureNotes.pdf
2. https://www.technicalsymposium.com/alllecturenotes_mech.html#.XPYtgtR95nI
3. http://www.engineering108.com/pages/Mechanical_Engineering/EME/element_of_ Mec hanical_engineering_ebooks-free-download.html

MOOC:

1. https://nptel.ac.in/downloads/112108148/
2. https://nptel.ac.in/courses/112107216/6
3. https://nptel.ac.in/downloads/112105129/
4. https://nptel.ac.in/courses/116102012/26

LIST OF PRACTICALS

Sr. No.	Title of Practical
1	To study of different types of fuels and lubrication.us types of boilers.
2	To study of Vapour Compression Refrigeration System.
3	To understand construction and working of vario
4	To understand construction and working of mountings and accessories of boiler.
5	To study of Otto, Diesel & Carnot cycle & find out its Air standard efficiencies.
6	To study of working of two stroke and four stroke Petrol & Diesel Engine.f belt drive and gear drive systems.
7	To determine the Swept volume & Clearance volume of Two stroke & Four stroke Petrol & Diesel Engine.
8	To study various types of gears and pulleys.
9	To study of various types of brakes, coupling and clutches
10	To determine velocity ratio o