

**GOPAL KRISHNA COLLEGE OF
ENGINEERING AND TECHNOLOGY**
GOURAHARI VIHAR, PO: RANIPUT, JEYPORE – 764 005

LESSON PLAN

Name of the Subject: BASIC MECHANICAL ENGINEERING (BME)

Name of the Faculty: Er. PRADEEP KUMAR NAHAK

Subject code:23ES1006

Course Structure:2-0-0

Semester: 2nd Semester

Branch:Mechanical

Semester From: January to April

No. of Weeks: 16

| Week | Day | Theory / Practical Topics | Classes |
|-------------|------------|--|----------------|
| 1 | | Unit 1 – Fundamentals of Thermodynamics | 14 |
| | 1 | Introduction to thermodynamics, systems and surroundings | 1 |
| | 2 | Properties, state, process and cycle | 1 |
| 2 | 3 | Internal energy and enthalpy | 1 |
| | 4 | Zerth Law of Thermodynamics | 1 |
| 3 | 5 | First Law of Thermodynamics | 1 |
| | 6 | Applications of First Law (numericals) | 1 |
| 4 | 7 | Second Law of Thermodynamics | 1 |
| | 8 | Entropy: basic concept | 1 |
| 5 | 9 | Properties of ideal gases | 1 |
| | 10 | Properties of pure substances | 1 |

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|-------------|------------|--|----------------|
| 6 | 11 | Steam properties: enthalpy, specific volume, internal energy | 1 |
| | 12 | Dryness fraction and use of steam tables | 1 |
| 7 | 13 | Numerical problems on thermodynamics | 1 |
| | 14 | Revision of Module-I | 1 |
| | | Unit 2 – Compressors, Power Plants and IC Engines | 6 |
| 8 | 15 | Single stage air compressor (working principle) | 1 |
| | 16 | Steam power plant (block diagram & working) | 1 |
| 9 | 17 | I.C. engines: classification and working principles | 1 |
| | 18 | Schematic diagrams of I.C. engines | 1 |
| | 19 | Numerical/problem-solving session | 1 |
| | 20 | Revision session | 1 |
| | | Unit 3 – Fluid Mechanics and Heat Transfer | 6 |
| 10 | 21 | Fluid mechanics: properties of fluids | 1 |
| | 22 | Fluid statics: pressure, Pascal's law | 1 |
| 11 | 23 | Fluid kinematics and dynamics (basic concepts) | 1 |
| | 24 | Heat transfer: modes and classification | 1 |
| | 25 | Tutorial/problem-solving session | 1 |

| Week | Day | Theory / Practical Topics | Classes |
|-------------|------------|---|----------------|
| | 26 | Revision session | 1 |
| | | Unit 4 – Engineering Materials and Manufacturing Processes | 6 |
| 12 | 27 | Engineering materials: classification | 1 |
| | 28 | Material properties | 1 |
| 13 | 29 | Manufacturing processes: casting (basics) | 1 |
| | 30 | Welding and forming processes (basics) | 1 |
| | 31 | Applications in industries | 1 |
| | 32 | Revision/problem-solving | 1 |
| | | Unit 5 – Power Transmission and Robotics | 6 |
| 14 | 33 | Power transmission: belt drives | 1 |
| | 34 | Gear drives | 1 |
| 15 | 35 | Clutches and brakes (working principle) | 1 |
| | 36 | Introduction to robotics: anatomy, joints and links | 1 |
| 16 | 37 | Robot configurations | 1 |
| | 38 | Revision, problem-solving and doubt clearing | 1 |

Books Recommended

1. *Basic Mechanical Engineering* by R.K. Rajput
2. *Elements of Mechanical Engineering* by S. Trymbaka Murthy
3. *Engineering Thermodynamics* by P.K. Nag
4. *Manufacturing Technology* by P.N. Rao

NPTEL Lectures

1. <https://nptel.ac.in/courses/112107209>
2. <https://nptel.ac.in/courses/112105123/>