

AMAG03 ELEMENTS OF MECHANICAL AND CIVIL ENGG.

UNIT-1 INTRODUCTION TO MECHANICAL ENGINEERING

- 1.1 Introduction to Mechanical Engineering: Engineering Materials
- 1.2 Classification - Ferrous & Non ferrous metals and alloys - Mechanical Properties.
- 1.3 Metal Joining Process (Welding only) Concept of welding
- 1.4 Gas Welding- Oxy acetylene welding - Types of flames - Arc welding
- 1.5 Straight & Reverse polarity - Manual metal arc welding - Electrode requirements - Soldering.
- 1.6 Manufacturing Process: Casting – Types of patterns - Pattern allowances
- 1.7 Sand mould casting - Forging Smith, Drop, Press & Machine forging.

UNIT-2 THERMODYNAMIC CONCEPTS & INTERNAL COMBUSTION ENGINE

- 2.1 Thermodynamic Concepts : Concept of temperature- Thermodynamics Laws- Zeroth, First and Second Law- Heat Transfer- Types of Heat Transfer
- 2.2 Conduction, Convection and Radiation (Concepts only).
- 2.3 Internal Combustion Engine: Working of Internal Combustion Engine- S.I. Engine- C.I. Engine- 2 stroke engine- 4 stroke engine.

UNIT-3 POWER GENERATION TECHNIQUES:

- 3.1 Various methods of power generation- Working Principle and Layouts of Thermal
- 3.2 Hydro- Nuclear- Wind- Solar power generation- Merits- Demerits.

UNIT-4 INTRODUCTION TO CIVIL ENGINEERING

- 4.1 Introduction to Civil Engineering, Scope of different field of Civil Engineering- Building Materials, Construction Technology, Geotechnical Engineering,
- 4.2 Structural Engineering, Hydraulics, Water Resources and Irrigation Engineering, Transportation Engineering, Environmental Engineering.
- 4.3 Roads: Type of roads, Components of road and their functions.
- 4.4 Bridges: Types of bridges and their Functions. Dams: Types of dams, uses of dams.

UNIT-5 BUILDING PLANNING & SURVEYING:

- 5.1 Elements of a building, planning requirements of Residential buildings.
- 5.2 Surveying: Principles of Surveying, Methods of surveying
- 5.3 Chain Surveying, leveling, theodolite, total station (Scope is limited to brief description of equipment only).

Reference Books:

1. S S Bhavikatti, “Elements of Civil Engineering”, 4th ed., Vikas Publishing House Pvt. Ltd., New Delhi, 2009.
2. R. Yadav, “Thermodynamics & Heat Engines, Volume-1”, 2nd ed., Central Publishing House, Allahabad, 2005.