**G. S. Mandal's**

# Maharashtra Institute of Technology (An Autonomous Institute)

# Aurangabad

## Department of Mechanical Engineering

### Second Year Mechanical (Autonomous)

**Course Outcomes**

| BSC 204: Linear Algebra and Transform | | |
|---|---|---|
| **CO No.** | **Code** | **Statement** |
| CO 1 | BSC 204.1 | Find Laplace transform of the given function. |
| CO 2 | BSC 204.2 | Make Use of complex number to find roots, separate complex quantities and establish relation between circular and hyperbolic functions |
| CO 3 | BSC 204.3 | Apply the matrix technique (Linear algebra) to find solutions of system of linear equations arising in many engineering problem |
| CO 4 | BSC 204.4 | Select and use appropriate probability distribution to find probability |
| CO 5 | BSC 204.5 | Solve higher order linear differential equations and apply them in electric and mechanical system |
| CO 6 | BSC 204.6 | Apply Inverse Laplace transforms to initial value problems |

**Mapping of Course Outcomes with Program Outcomes**

| CO No. | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO 1** | 2 | 1 | - | - | - | - | - | - | - | - | - | - |
| **CO 2** | 2 | 1 | - | - | - | - | - | - | - | - | - | - |
| **CO 3** | 2 | 1 | - | - | - | - | - | - | - | - | - | 1 |
| **CO 4** | 2 | 1 | - | - | - | - | - | - | - | - | - | 1 |
| **CO 5** | 2 | 1 | - | - | - | - | - | - | - | - | - | - |
| **CO 6** | 2 | 1 | - | - | - | - | - | - | - | - | - | - |
| **Avg.** | 2 | 1 | - | - | - | - | - | - | - | - | - | 1 |

**Mapping of Course Outcomes with Program Specific Outcomes**

| CO No. | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|
| **CO 1** | - | 1 | - |
| **CO 2** | - | - | - |
| **CO 3** | 1 | - | - |
| **CO 4** | - | - | 1 |
| **CO 5** | 1 | - | - |
| **CO 6** | - | 1 | - |
| **Avg.** | 1 | 1 | 1 |

**Course Outcomes**

| MED 201: Strength of Materials | | |
|---|---|---|
| **CO No.** | **Code** | **Statement** |
| CO 1 | MED 201.1 | Define the terms related to stress strain relationship of elastic body |
| CO 2 | MED 201.2 | Explain the concept of elements of strength of materials |
| CO 3 | MED 201.3 | Infer the stress strain relations in deformable bodies |
| CO 4 | MED 201.4 | Calculate the stress state of bodies subjected to axial, torsional, transverse, and bending loads |
| CO 5 | MED 201.5 | Find the thermal stress-strain, and strain energy in deforming body |
| CO 6 | MED 201.6 | Analyze the shear force, bending moment diagram, slope and deflection of beam, state of stress at point |

**Mapping of Course Outcomes with Program Outcomes**

| CO No. | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO 1** | 3 | - | - | - | - | - | - | - | - | - | - | 3 |
| **CO 2** | 3 | - | - | - | - | - | - | - | - | - | - | 2 |
| **CO 3** | 3 | 3 | 3 | - | - | - | - | - | - | - | - | - |
| **CO 4** | 3 | 3 | - | - | - | - | - | - | - | - | - | - |
| **CO 5** | 3 | 3 | 3 | - | - | - | - | - | - | - | - | - |
| **CO 6** | 3 | 3 | 3 | - | - | - | - | - | - | - | - | - |
| **Avg.** | 3 | 3 | 3 | - | - | - | - | - | - | - | - | 2.5 |

**Mapping of Course Outcomes with Program Specific Outcomes**

| CO No. | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|
| **CO 1** | - | - | - |
| **CO 2** | - | - | - |
| **CO 3** | 3 | - | - |
| **CO 4** | - | - | - |
| **CO 5** | 3 | 1 | - |
| **CO 6** | 3 | - | - |
| **Avg.** | 3 | 1 | - |

**Course Outcomes**

| MED 202: Fluid Mechanics and Fluid Machines | | |
|---|---|---|
| **CO No.** | **Code** | **Statement** |
| CO 1 | MED 202.1 | Describe the fluid and flow properties of fluids. |
| CO 2 | MED 202.2 | Apply conservation laws to fluid flow problems in engineering applications |
| CO 3 | MED 202.3 | Classify the fluid flow and hydraulic Machines |
| CO 4 | MED 202.4 | Compute the Discharge Major and Minor losses and forces exerted by the jet in various conditions. |
| CO 5 | MED 202.5 | Design the working proportions of hydraulic machines. |
| CO 6 | MED 202.6 | Evaluate the performance of hydraulics machines with operating conditions |

**Mapping of Course Outcomes with Program Outcomes**

| CO No. | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO 1** | 3 | - | 2 | 2 | - | - | - | - | - | - | - | 2 |
| **CO 2** | 3 | 2 | 2 | | - | - | - | - | - | - | - | - |
| **CO 3** | 3 | 1 | 3 | 2 | 2 | - | - | - | - | - | - | 1 |
| **CO 4** | 3 | 1 | 3 | 2 | - | - | - | - | - | - | - | 2 |
| **CO 5** | 3 | 2 | 2 | - | - | - | - | - | - | - | - | 2 |
| **CO 6** | 2 | 2 | | 3 | 2 | - | - | - | - | - | - | 2 |
| **Avg.** | 2.83 | 1.6 | 2.4 | 2.25 | 2.0 | - | - | - | - | - | - | 1.8 |

**Mapping of Course Outcomes with Program Specific Outcomes**

| CO No. | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|
| **CO 1** | - | 2 | - |
| **CO 2** | - | 2 | - |
| **CO 3** | - | - | - |
| **CO 4** | - | 2 | - |
| **CO 5** | 1 | 1 | - |
| **CO 6** | - | 2 | - |
| **Avg.** | 1 | 1.8 | - |

**Course Outcomes**

| MED 203: Metrology and Quality Control | | |
|---|---|---|
| **CO No.** | **Code** | **Statement** |
| CO 1 | MED 203.1 | Recall the basics knowledge of metrology and measuring devices. |
| CO 2 | MED 203.2 | Explain different linear and angular measuring precise instruments and apply the acquired knowledge for the accurate and precise measurement. |
| CO 3 | MED 203.3 | Apply knowledge of various tools and techniques used to determine geometry and dimensions of components to produce quality products. |
| CO 4 | MED 203.4 | Analyze the data of measurement for understanding the concept of quality and Statistical Quality Control. |
| CO 5 | MED 203.5 | Examine the deviation and surface finish of the measured parts with measuring tools. |
| CO 6 | MED 203.6 | Discuss the concept of Quality, principles of Statistical Quality Control, seven quality control tools and acceptance sampling |

**Mapping of Course Outcomes with Program Outcomes**

| CO No. | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO 1** | 3 | 2 | - | 1 | 1 | - | - | - | - | - | - | - |
| **CO 2** | 1 | 2 | 1 | 2 | - | - | - | - | - | - | - | - |
| **CO 3** | - | 1 | 3 | 1 | 2 | - | - | - | - | - | - | - |
| **CO 4** | 1 | 2 | 1 | 2 | - | - | - | - | - | - | - | - |
| **CO 5** | - | - | 3 | - | - | - | - | - | - | - | - | - |
| **CO 6** | - | 3 | - | 1 | - | - | - | - | - | - | - | - |
| **Avg.** | 1.16 | 2 | 2 | 1.4 | 1.5 | - | - | - | - | - | - | - |

**Mapping of Course Outcomes with Program Specific Outcomes**

| CO No. | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|
| **CO 1** | - | - | - |
| **CO 2** | - | - | 1 |
| **CO 3** | - | - | 3 |
| **CO 4** | - | - | 3 |
| **CO 5** | - | - | 1 |
| **CO 6** | - | - | - |
| **Avg.** | - | - | 2 |

**Course Outcomes**

| MED 204: Manufacturing Processes | | |
|---|---|---|
| **CO No.** | **Code** | **Statement** |
| CO 1 | MED 204.1 | Recall classification, advantages, disadvantages and applications of various manufacturing processes |
| CO 2 | MED 204.2 | Explain the working principle of different conventional and unconventional manufacturing processes |
| CO 3 | MED 204.3 | Describe construction, working and specifications of machine tools required for manufacturing |
| CO 4 | MED 204.4 | Identify process variables affecting the product quality in manufacturing processes |
| CO 5 | MED 204.5 | Choose the appropriate manufacturing processes for producing a given component |
| CO 6 | MED 204.6 | Calculate machining time of turning, drilling and milling operations for producing given component |

**Mapping of Course Outcomes with Program Outcomes**

| CO No. | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO 1** | 3 | - | - | - | - | - | - | - | - | - | - | - |
| **CO 2** | 1 | - | 3 | - | - | - | - | - | - | - | - | - |
| **CO 3** | 3 | - | - | - | - | - | - | - | - | 1 | - | - |
| **CO 4** | 3 | - | 2 | - | - | - | - | - | - | - | - | - |
| **CO 5** | 1 | - | 3 | - | - | - | - | - | - | - | - | - |
| **CO 6** | 3 | - | - | - | - | - | - | - | - | - | - | - |
| **Avg.** | 2.33 | - | 2.66 | - | - | - | - | - | - | 1 | - | - |

**Mapping of Course Outcomes with Program Specific Outcomes**

| CO No. | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|
| **CO 1** | - | - | 3 |
| **CO 2** | - | - | 3 |
| **CO 3** | - | - | 3 |
| **CO 4** | - | - | 3 |
| **CO 5** | - | - | 3 |
| **CO 6** | - | - | 3 |
| **Avg.** | - | - | 3 |

**Course Outcomes**

| HSM 804: Constitution of India | | |
|---|---|---|
| **CO No.** | **Code** | **Statement** |
| CO 1 | HSM 804.1 | Understand the meaning and importance of Constitution |
| CO 2 | HSM 804.2 | Explain the importance of Preamble of the Indian Constitution and its significance |
| CO 3 | HSM 804.3 | Explain the Salient (Outstanding) features of Indian Constitution |
| CO 4 | HSM 804.4 | Identify the importance of fundamental rights as well as fundamental duties |
| CO 5 | HSM 804.5 | Explain the uses of directive principles of state policy |
| CO 6 | HSM 804.6 | Explain the structure and functioning of Union and state executives and election commission |

**Mapping of Course Outcomes with Program Outcomes**

| CO No. | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO 1** | - | - | - | - | - | 3 | - | 3 | - | - | - | - |
| **CO 2** | - | - | - | - | - | 3 | - | 3 | - | - | - | - |
| **CO 3** | - | - | - | - | - | 3 | - | 3 | - | - | - | - |
| **CO 4** | - | - | - | - | - | 3 | - | 3 | - | - | - | - |
| **CO 5** | - | - | - | - | - | 3 | - | 3 | - | - | - | - |
| **CO 6** | - | - | - | - | - | 3 | - | 3 | - | - | - | - |
| **Avg.** | - | - | - | - | - | 3 | - | 3 | - | - | - | - |

**Mapping of Course Outcomes with Program Specific Outcomes**

| CO No. | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|
| **CO 1** | - | - | - |
| **CO 2** | - | - | - |
| **CO 3** | - | - | - |
| **CO 4** | - | - | - |
| **CO 5** | - | - | - |
| **CO 6** | - | - | - |
| **Avg.** | - | - | - |

**Course Outcomes**

| BSC 251B: Complex Variable and Vector Calculus | | |
|---|---|---|
| **CO No.** | **Code** | **Statement** |
| CO 1 | BSC 251B.1 | Find the Fourier transform of given function |
| CO 2 | BSC 251B.2 | Express the function in Fourier series in different intervals |
| CO 3 | BSC 251B.3 | Discuss the function of complex variables |
| CO 4 | BSC 251B.4 | Make use of partial derivatives for differentiation of vector functions |
| CO 5 | BSC 251B.5 | Evaluate vector integral by Stoke's theorem & Gauss theorem |
| CO 6 | BSC 251B.6 | Solve the difference equations by z-transform or<br>Solve partial differential equations by separation of variables |

**Mapping of Course Outcomes with Program Outcomes**

| CO No. | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO 1** | 2 | 1 | - | - | - | - | - | - | - | - | - | - |
| **CO 2** | 2 | 1 | - | - | - | - | - | - | - | - | - | - |
| **CO 3** | 2 | 1 | - | - | - | - | - | - | - | - | - | - |
| **CO 4** | 2 | 1 | - | - | - | - | - | - | - | - | - | - |
| **CO 5** | 2 | 1 | - | - | - | - | - | - | - | - | - | - |
| **CO 6** | 2 | 1 | - | - | - | - | - | - | - | - | - | - |
| **Avg.** | 2 | 1 | - | - | - | - | - | - | - | - | - | - |

**Mapping of Course Outcomes with Program Specific Outcomes**

| CO No. | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|
| **CO 1** | - | 1 | - |
| **CO 2** | - | - | - |
| **CO 3** | - | - | 1 |
| **CO 4** | - | - | - |
| **CO 5** | - | - | - |
| **CO 6** | - | 1 | 1 |
| **Avg.** | - | 1 | 1 |

**Course Outcomes**

| MED 251: Machine Drawing | | |
|---|---|---|
| **CO No.** | **Code** | **Statement** |
| CO 1 | MED 251.1 | Convert pictorial views of machine components into sectional orthographic views. |
| CO 2 | MED 251.2 | Draw the development of the lateral surface of cut solids and the plane that cuts the solid. |
| CO 3 | MED 251.3 | Interpret the true shape of arrangement of any geometric solids like prisms, pyramids, cone, cylinder and any other standard machine component |
| CO 4 | MED 251.4 | Draw different engineering curves and know their applications. |
| CO 5 | MED 251.5 | Classify various machine parts and their joints using standard conventions |
| CO 6 | MED 251.6 | Develop an assembly drawing using parts drawing of machine components |

**Mapping of Course Outcomes with Program Outcomes**

| CO No. | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO 1** | 3 | - | - | - | - | - | - | - | - | - | - | - |
| **CO 2** | 3 | - | - | - | - | - | - | - | - | - | - | - |
| **CO 3** | 3 | - | - | - | - | - | - | - | - | - | - | - |
| **CO 4** | 3 | - | - | - | - | - | - | - | - | - | - | - |
| **CO 5** | 3 | 2 | 2 | - | - | - | - | - | - | - | - | - |
| **CO 6** | 3 | 2 | 2 | - | - | - | - | - | - | - | - | - |
| **Avg.** | 3 | 2 | 2 | - | - | - | - | - | - | - | - | - |

**Mapping of Course Outcomes with Program Specific Outcomes**

| CO No. | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|
| **CO 1** | 2 | - | - |
| **CO 2** | 2 | - | - |
| **CO 3** | 2 | - | - |
| **CO 4** | 2 | - | - |
| **CO 5** | 2 | - | - |
| **CO 6** | 2 | - | - |
| **Avg.** | 2 | - | - |

**Course Outcomes**

| MED 252: Artificial Intelligence in Manufacturing | | |
|---|---|---|
| **CO No.** | **Code** | **Statement** |
| CO 1 | MED 252.1 | Discuss the concept of Artificial Intelligence |
| CO 2 | MED 252.2 | Interpret the role of various domains of Artificial Intelligence in view of manufacturing domain |
| CO 3 | MED 252.3 | Explain the various techniques and applications of computer vision with respect to the manufacturing domain |
| CO 4 | MED 252.4 | Demonstrate the awareness about role of robotics in the manufacturing domain |
| CO 5 | MED 252.5 | Choose the appropriate AI use case for solving given problem in manufacturing domain |
| CO 6 | MED 252.6 | Build a machine learning model in Python by using any of the ML algorithms |

**Mapping of Course Outcomes with Program Outcomes**

| CO No. | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO 1** | - | - | - | - | 3 | - | - | - | - | - | - | - |
| **CO 2** | - | - | - | - | 3 | - | - | - | - | - | - | - |
| **CO 3** | - | - | - | - | 3 | - | - | - | - | - | - | - |
| **CO 4** | 2 | - | - | - | 3 | - | - | - | - | - | - | - |
| **CO 5** | - | - | 3 | - | - | - | - | - | - | - | - | - |
| **CO 6** | 1 | - | 1 | - | 3 | - | - | - | - | - | - | - |
| **Avg.** | 1.5 | - | 2 | - | 3 | - | - | - | - | - | - | - |

**Mapping of Course Outcomes with Program Specific Outcomes**

| CO No. | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|
| **CO 1** | - | 3 | - |
| **CO 2** | - | 3 | - |
| **CO 3** | - | 3 | - |
| **CO 4** | - | 3 | - |
| **CO 5** | - | 3 | - |
| **CO 6** | - | 3 | - |
| **Avg.** | - | 3 | - |

**Course Outcomes**

| MED 253: Engineering Thermodynamics | | |
|---|---|---|
| **CO No.** | **Code** | **Statement** |
| CO 1 | MED 253.1 | Recall the concepts of physics and thermodynamics. |
| CO 2 | MED 253.2 | Summarize governing equations and principles of physics, thermodynamics and fluid mechanics applicable for various thermal systems. |
| CO 3 | MED 253.3 | Apply thermodynamics laws for studying performance of different thermodynamic processes, involving pure substances, using thermodynamic relations involving entropy, properties of steam, enthalpy-entropy (h-s) chart or mollier diagram, dryness fraction measurement |
| CO 4 | MED 253.4 | Analysis of various thermodynamic power cycles. |
| CO 5 | MED 253.5 | Evaluate the performance analysis of various thermal systems. |
| CO 6 | MED 253.6 | Elaborate the energy performance assessment for various thermal machines and utility systems. |

**Mapping of Course Outcomes with Program Outcomes**

| CO No. | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO 1** | 2 | - | - | - | - | - | - | - | - | - | - | - |
| **CO 2** | 2 | - | - | - | - | - | - | - | - | - | - | - |
| **CO 3** | 2 | 2 | - | - | - | - | - | - | - | - | - | - |
| **CO 4** | 2 | 2 | - | - | - | - | - | - | - | - | - | - |
| **CO 5** | 2 | - | - | - | - | - | - | - | - | - | - | - |
| **CO 6** | 2 | - | 2 | - | - | - | - | - | - | - | - | - |
| **Avg.** | 2 | 2 | 2 | - | - | - | - | - | - | - | - | - |

**Mapping of Course Outcomes with Program Specific Outcomes**

| CO No. | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|
| **CO 1** | - | 2 | - |
| **CO 2** | - | 2 | - |
| **CO 3** | - | 2 | - |
| **CO 4** | - | 2 | - |
| **CO 5** | - | 2 | - |
| **CO 6** | - | 2 | - |
| **Avg.** | - | 2 | - |

**Course Outcomes**

| Professional Elective MED 281: Additive Manufacturing | | |
|---|---|---|
| **CO No.** | **Code** | **Statement** |
| CO 1 | MED 281.1 | Understand the working principles and process parameters of additive manufacturing processes. |
| CO 2 | MED 281.2 | Explore different additive manufacturing processes and suggest suitable methods for building a particular component. |
| CO 3 | MED 281.3 | Design and develop a working model using additive manufacturing Processes. |
| CO 4 | MED 281.4 | Perform suitable post processing operation based on product repair requirement. |
| CO 5 | MED 281.5 | Select various engineering materials based on the properties and desired applications. |
| CO 6 | MED 281.6 | Create aesthetic models having market appeal. |

**Mapping of Course Outcomes with Program Outcomes**

| CO No. | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO 1** | 2 | - | - | - | - | - | - | - | - | - | - | - |
| **CO 2** | 2 | - | - | - | - | - | - | - | - | - | - | - |
| **CO 3** | 2 | 2 | - | - | - | - | - | - | - | - | - | - |
| **CO 4** | 2 | - | - | - | - | - | - | - | - | - | - | - |
| **CO 5** | 2 | - | - | - | - | - | - | - | - | - | - | - |
| **CO 6** | 2 | 2 | - | - | - | - | - | - | - | - | - | - |
| **Avg.** | 2 | 2 | - | - | - | - | - | - | - | - | - | - |

**Mapping of Course Outcomes with Program Specific Outcomes**

| CO No. | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|
| **CO 1** | 1 | - | - |
| **CO 2** | 1 | - | - |
| **CO 3** | 2 | - | - |
| **CO 4** | 1 | - | - |
| **CO 5** | 1 | - | - |
| **CO 6** | 2 | - | - |
| **Avg.** | 1.66 | - | - |

**Course Outcomes**

| Professional Elective MED 282: Modern Energy Sources | | |
|---|---|---|
| **CO No.** | **Code** | **Statement** |
| CO 1 | MED 282.1 | Recall the fundamental concepts of energy conversion and conservation for various modern energy sources. |
| CO 2 | MED 282.2 | Summarize the main components of energy conversion systems applicable for various modern energy sources. |
| CO 3 | MED 282.3 | Apply the basic concepts and knowledge for the performance analysis of different energy systems. |
| CO 4 | MED 282.4 | Comparison of various modern energy sources and systems based on various parameters. |
| CO 5 | MED 282.5 | Examine modern energy systems based on design aspect/criteria. |
| CO 6 | MED 282.6 | Inference the data of modern energy sources to meet future energy demand. |

**Mapping of Course Outcomes with Program Outcomes**

| CO No. | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO 1** | 2 | - | - | - | - | - | - | - | - | - | - | - |
| **CO 2** | 2 | - | - | - | - | - | - | - | - | - | - | - |
| **CO 3** | 2 | 2 | - | - | - | - | - | - | - | - | - | - |
| **CO 4** | 2 | 2 | - | - | - | - | - | - | - | - | - | - |
| **CO 5** | 2 | - | - | - | - | - | - | - | - | - | - | - |
| **CO 6** | 2 | - | 2 | - | - | - | - | - | - | - | - | - |
| **Avg.** | 2 | 2 | 2 | - | - | - | - | - | - | - | - | - |

**Mapping of Course Outcomes with Program Specific Outcomes**

| CO No. | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|
| **CO 1** | - | 2 | - |
| **CO 2** | - | 2 | - |
| **CO 3** | - | 2 | - |
| **CO 4** | - | 2 | - |
| **CO 5** | - | 2 | - |
| **CO 6** | - | 2 | - |
| **Avg.** | - | 2 | - |

**Course Outcomes**

| Professional Elective MED 283: Industrial Hydraulics and Pneumatics | | |
|---|---|---|
| **CO No.** | **Code** | **Statement** |
| CO 1 | MED 283.1 | Determine the importance of Hydraulic and Pneumatic Systems in industry automation. |
| CO 2 | MED 283.2 | Identify various components like pumps, Motors and Actuators used in Hydraulic systems. |
| CO 3 | MED 283.3 | Describe the various Hydraulic Valves and Hydraulic system Accessories used in industry. |
| CO 4 | MED 283.4 | Design and simulate the Hydraulic, Pneumatic, Electro-Hydraulic and Electro-Pneumatic circuits using software and experimentation. |
| CO 5 | MED 283.5 | Determine various Pneumatic systems and its application in industry. |
| CO 6 | MED 283.6 | Describe various Pneumatic Cylinders, Motors and Valves for industry. |

**Mapping of Course Outcomes with Program Outcomes**

| CO No. | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO 1** | 1 | - | - | - | - | - | - | - | - | - | - | - |
| **CO 2** | 1 | - | - | - | - | - | - | - | - | - | - | - |
| **CO 3** | 2 | - | - | - | - | - | - | - | - | - | - | - |
| **CO 4** | 1 | - | - | - | - | - | - | - | - | - | - | - |
| **CO 5** | 1 | - | - | - | - | - | - | - | - | - | - | - |
| **CO 6** | 2 | - | - | - | - | - | - | - | - | - | - | - |
| **Avg.** | 1.33 | - | - | - | - | - | - | - | - | - | - | - |

**Mapping of Course Outcomes with Program Specific Outcomes**

| CO No. | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|
| **CO 1** | 1 | - | - |
| **CO 2** | 1 | - | - |
| **CO 3** | 1 | - | - |
| **CO 4** | 2 | - | - |
| **CO 5** | 1 | - | - |
| **CO 6** | 1 | - | - |
| **Avg.** | 1.16 | - | - |