

**Ballari Institute of Technology & Management, Ballari**  
**Department of Mechanical Engineering**

**INSTITUTE VISION AND MISSION**

**VISION**

We will be a Top Notch Educational Institution that Provides best of breed Educational Services by leveraging technology and delivered by best in class People in line with the Globalized world.

**MISSION**

To empower the Students with Technical & Managerial Skills, professional ethics & values, and an appreciation of Human Creativity & Innovation for an inquisitive mind.

**DEPARTMENT VISION AND MISSION**

**VISION:**

To have the ability to anticipate and effectively respond to changes in the field of Mechanical Engineering, to be perceived as being one of the best department known for its dedicated services for students satisfaction and to provide world class training to students for better society.

**MISSION:**

To become a centre of excellence of International standards, to educate Mechanical Engineering graduate to stay competitive at the cutting edge of technology with strong ethics and instill learning for achievements to benefit mankind.

## **Programme Educational Objectives (PEOs)**

1. To make graduates self sustained by exploring to engineering problems with innovative ideas to tackle real-time issues.
2. To make graduates aware of the significance of competence in core engineering concepts, to adopt good ethical and leadership qualities.
3. To inculcate the graduates to pursue lifelong learning processes.

## **Programme Outcomes(POs)**

- a. The graduates will demonstrate the knowledge of Mathematics, Basic Sciences and Engineering.
- b. The graduates will develop an ability to identify, formulate and solve engineering problems.
- c. The graduates will be able to design, conduct experiments, analyze and interpret the data.
- d. The graduates will exhibit skills to use modern engineering tools, software, and equipment to address the technical problems.
- e. The graduates will show the understanding of the engineering solutions on the society and will be aware of contemporary issues.
- f. The graduates will exhibit the knowledge of professional and ethical responsibilities.
- g. The graduates will be able to communicate effectively both in verbal and written form.
- h. The graduates will gain confidence for self improvement and lifelong learning.
- i. The graduates will develop an instinct to investigate complex technical tasks.
- j. The graduate is exposed to pros and cons of advanced technology towards environment and sustainability.

- k. The graduate is capable of working both individually and as well in a team.
- l. The graduates will acquire managerial skill to address economy and projects.

### **III Semester course outcomes contribute to the POs**

<b>Course Title &amp; Course Code</b>	<b>Course Outcomes</b>	<b>Mapping of Course outcomes with Programme outcomes</b>
Engineering Mathematics- III 10MAT31	At the End of the Course the Students will be able to: <ul style="list-style-type: none"> <li>• Apply Fourier series and Fourier transforms in formulations and solving different engineering problems.</li> <li>• Demonstrate the skills in forming partial differential equations and solving heat, wave and Laplace equation.</li> <li>• Write programs using numerical techniques to solve engineering problems.</li> <li>• Apply Euler's formula to solve geodesics, hanging chain and brachistochrone problems.</li> <li>• Apply Z-transforms to solve difference equations.</li> </ul>	a,b,c, e,i
Material Science & Metallurgy 10ME32A	At the End of the Course the Students will be able to: <ul style="list-style-type: none"> <li>• State the need for studying material science and engineering.</li> <li>• Demonstrate the crystal structure and atomic diffusion in different materials.</li> <li>• Demonstrate the knowledge of selection of suitable materials for specific application by knowing their mechanical behavior.</li> <li>• Demonstrate the ability of identifying fracture, creep, and fatigue in different materials that are subjected to load under different conditions.</li> <li>• Demonstrate the ability to understand the solidification process of different metals and to develop their phase diagrams.</li> <li>• Evaluate the benefits of Ferrous and non ferrous materials for specific</li> </ul>	a,e,i,j

	<p>application.</p> <ul style="list-style-type: none"> <li>• Apply the basic concepts to create new and advanced materials useful for society.</li> </ul>	
Basic Thermodynamics 10ME33	<p>At the End of the Course the Students will be able to:</p> <ul style="list-style-type: none"> <li>• Demonstrate fundamental concepts.</li> <li>• Express Heat and Work transfer and their sign convention.</li> <li>• Implement Thermodynamic Laws in various processes.</li> <li>• Demonstrate Kelvin Plank and Clausius statement.</li> <li>• Incorporate Available energy and Unavailable energy, Express Availability, Irreversibility and useful work.</li> <li>• Demonstrate Mixture of saturated liquid, vapour, and super heated states.</li> <li>• Implement Vander Waals equation.</li> </ul>	a,b,d,i,
Mechanics of Materials 10ME34	<p>At the End of the Course the Students will be able to:</p> <ul style="list-style-type: none"> <li>• Define Stress, Strain and outline the mechanical properties of the materials</li> <li>• Apply the Hooke's law and Poisson's ratio in practical applications</li> <li>• Demonstrate Stress-Strain relation and analyze the different bars subjected to system of forces</li> <li>• Analyze the stresses in composite sections</li> <li>• Analyze the stresses on inclined section using Mohr's circle</li> <li>• Evaluate the stresses in thin and thick cylinders subjected to internal and external pressure</li> <li>• Analyze graphically the various beams subjected to different types of loads using SFD and BMD</li> <li>• Analyze the beams subjected to bending using the theory of simple bending</li> <li>• Construct the shear stress distributions for a beams of symmetrical I an T sections</li> <li>• Analyze the deflection of beams using deflection equation</li> <li>• Predict the effect of torsion in case of circular shafts</li> <li>• Analyze the elastic stability of columns using Euler's and Rankine's</li> </ul>	a,b,d,e,i

	theory.	
Manufacturing Process – I 10ME35	<ul style="list-style-type: none"> <li>• Identify and select a suitable production process.</li> <li>• Analyze and apply the casting principles to the solution of variety of practical problems.</li> <li>• Design a casting process as per needs and specifications.</li> <li>• Work to produce simple and more complicated castings.</li> <li>• Use advanced casting techniques and equipment to produce good castings.</li> <li>• Analyze and apply the NDT techniques for the inspection of ferrous and non-ferrous objects.</li> <li>• Identify, select and apply the welding techniques for joining metals and alloys.</li> <li>• Participate, succeed in competitive examinations.</li> </ul>	a,d,e,j
Computer Aided Machine Drawing 10ME36A	<ul style="list-style-type: none"> <li>• Construct a drawing using the drawing tools such as mini-drafter, drawing board etc.</li> <li>• Draw the cut section of solids such as pyramids, prisms, cylinders and cones.</li> <li>• Produce a two dimensional drawing from a three dimensional drawing of an object.</li> <li>• Select the particular threaded form to suit its application.</li> <li>• State the best key suited for a particular application.</li> <li>• Quote the most suitable joint for an application like boiler joint, shaft joint etc.</li> <li>• Identify the most suitable coupling to transmit power.</li> <li>• Create an assembly drawing from its details.</li> </ul>	a,b,c,d,l
Metallography & Material Testing Lab 10ME37A	<ul style="list-style-type: none"> <li>• Evaluate the Microstructure of plain carbon steel, tool steel, SG iron, Brass, Bronze &amp; Composites.</li> <li>• Evaluate the effect of heat treatment processes like Annealing, Normalizing Hardening and</li> <li>• Tempering on the hardness of the metallic specimen.</li> <li>• Analyze the wear characteristics of ferrous, non-ferrous and composite materials for different Parameters.</li> <li>• Demonstrate the procedure for</li> </ul>	a,c,e,i,j

	<p>detecting flaws using Ultrasonic flaw detection equipment.</p> <ul style="list-style-type: none"> <li>• Demonstrate the procedure for detecting cracks using Magnetic crack detection equipment.</li> <li>• Demonstrate the procedure for detecting welding defects using Dye penetration testing.</li> <li>• Define Young's Modulus, Yield stress, Ultimate stress, Break stress, Elastic region, Plastic region, Brittleness and Ductility.</li> <li>• Define modulus of Elasticity in shear, Torsion yield strength.</li> <li>• Analyze the relationship between load, span, width, height and deflection of beam.</li> <li>• Define impact strength, toughness, hardness.</li> </ul>	
<p>Foundry &amp; Forging Lab 10ME38A</p>	<p>At the End of the Course the Students will be able to:</p> <ul style="list-style-type: none"> <li>• Identify the different properties &amp; select mould &amp; core sand.</li> <li>• Analyze &amp; apply the casting principles to the solution of variety of practical problems.</li> <li>• Design a casting process as per needs &amp; specifications.</li> <li>• Work to produce simple &amp; more complicated castings.</li> <li>• Analyze &amp; apply the forging principles for production of simple &amp; complicated forgings.</li> <li>• Communicate effectively in both verbal &amp; written form.</li> <li>• Demonstrate the knowledge of professional &amp; ethical responsibilities.</li> <li>• Participate, succeed in competitive examinations.</li> </ul>	<p>a,c,d,i,</p>