
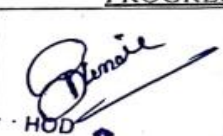
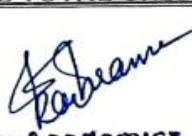
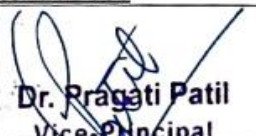
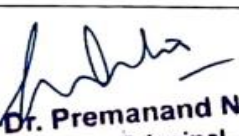
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<b>Third Year (Semester-V) B.Tech. Mechanical Engineering</b>		
<b>BME33501: Heat Transfer</b>		

	Course Outcomes	CL
<b>BME33501.1</b>	<b>Calculate</b> the heat transfer rates through conduction, convection, and radiation using heat transfer laws to solve heat transfer problems.	3
<b>BME33501.2</b>	<b>Apply</b> the concepts of conduction to solve problem in heat transfer system	3
<b>BME33501.3</b>	<b>Illustrate</b> the concept of hydrodynamic and thermal boundary layers over flat plates for real-world practical applications.	3
<b>BME33501.4</b>	<b>Analyze</b> radiation heat transfer between surfaces, focusing on the differences in radiation exchange for grey, black, and real surfaces.	4
<b>BME33501.5</b>	<b>Evaluate</b> the heat transfer rate and effectiveness of heat exchangers to assess their performance.	5

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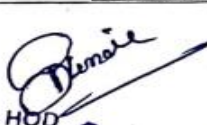
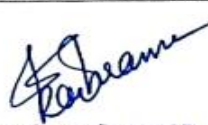
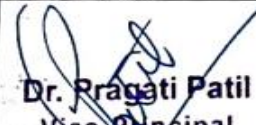

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**Third Year(Semester-V)B. Tech. Mechanical Engineering**





**BME33502: Kinematics and Dynamics of Machinery**



	Course Outcomes	CL
<b>BME33502.1</b>	<b>Illustrate</b> the mechanisms and kinematic pairs, by Grubber's and Kutzbach's criteria to classify four-bar chains.	3
<b>BME33502.2</b>	<b>Explain</b> the kinematic analysis of simple mechanisms, to determine velocity and acceleration.	3
<b>BME33502.3</b>	<b>Analyze</b> the gyroscopic effects on airplane to determine the stability and behavior of systems.	4
<b>BME33502.4</b>	<b>Apply</b> the principles of cam dynamics and governors to solve problems related to cam jump-off phenomenon and governor characteristics,	3
<b>BME33502.5</b>	<b>Analyze</b> the vibration behavior of undamped system to determining the logarithmic decrement, magnification factor, and vibration isolation on system performance,.	4

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<b>Third Year(Semester-V)B. Tech. Mechanical Engineering</b>		
<b>BME33503: Design of Machine Elements</b>		



	Course Outcomes	CL
<b>BME33503.1</b>	<b>Apply</b> the principles of machine design and material selection to solve the problems on mechanical engineering components.	3
<b>BME33503.2</b>	<b>Classify</b> welded joints and pressure vessels by applying strength and pressure theories to ensure structural integrity and safety under loading conditions.	4
<b>BME33503.3</b>	<b>Analyze</b> solid and hallow shaft using standard design procedures and codes to determine power transmission strength.	4
<b>BME33503.4</b>	<b>Explain</b> the principles of axial loading and torque to solve problems on power screws for mechanical transmission systems.	4
<b>BME33503.5</b>	<b>Design</b> clutches and brakes for automobile applications considering performance, safety, and material selection.	4

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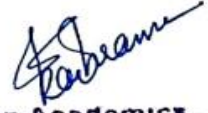


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<b>Third Year (Semester-V) B. Tech. Mechanical Engineering</b>		
<b>B\$\$32XX: Open Elective-III (Additive Manufacturing)</b>		



	Course Outcomes	CL
B\$\$32XX.1	<b>Illustrate</b> the applications and working principles of 3D printing technologies in additive manufacturing for product development.	3
B\$\$32XX.2	<b>Select</b> appropriate materials for additive manufacturing, considering the layer-by-layer deposition requirements of 3D printing.	4
B\$\$32XX.3	<b>Interpret</b> the capabilities of additive manufacturing equipment in terms of requirement of process type, material and application.	4

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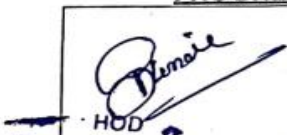
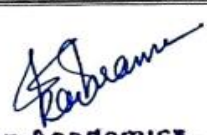
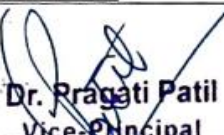
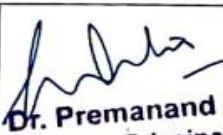
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<b>Third Year (Semester-V) B. Tech. Mechanical Engineering</b>		
<b>BME33504: (PE-I) Industrial Economics and Management</b>		

	Course Outcomes	CL
BME33504.1	<b>Interpret</b> demand and supply principles, including elasticity and determinants, in relation to market price dynamics.	3
BME33504.2	<b>Explain</b> the principles of production economics, for practical applications in firms and industries.	3
BME33504.3	<b>Analyze</b> the causes and effects of inflation and market structures, to determine impact on economic decision-making.	4
BME33504.4	<b>Summarize</b> key marketing management principles, to determine customer product preferences.	5
BME33504.5	<b>Illustrate</b> the concept of financial management for the development of business.	3



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<b>Third Year (Semester-V) B. Tech. Mechanical Engineering</b>		
<b>BME33505: (PE-I) Computer Aided Design</b>		




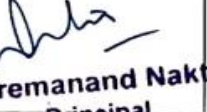
	Course Outcomes	CL
<b>BME33505.1</b>	<b>Summarize</b> the application of computer-aided design (CAD) for creating geometric entities.	4
<b>BME33505.2</b>	<b>Apply</b> Matrices of 2D and 3D transformations, to solve problems in computer graphics.	3
<b>BME33505.3</b>	<b>Analyze</b> modeling techniques to determine their effectiveness in solving engineering problems.	4
<b>BME33505.4</b>	<b>Interpret</b> trusses using FEM technique to find efficient simulation of complex systems.	3
<b>BME33505.5</b>	<b>Explain</b> the application of FEM in plane truss problems, to determine structural behavior under loads and boundary condition.	4



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<b>Third Year (Semester-V) B. Tech. Mechanical Engineering</b>		
<b>BME33506: (PE-I) Automotive System</b>		

	Course Outcomes	CL
<b>BME33506.1</b>	<b>Interpret</b> automobile components, uncovering their operational principles	3
<b>BME33506.2</b>	<b>Analyze</b> transmission systems to determine their impact on vehicle dynamics.	4
<b>BME33506.3</b>	<b>Explain</b> the principles of Chassis, to determine vehicle safety and performance.	4
<b>BME33506.4</b>	<b>Summarize</b> maintenance of automotive electrical systems, to know their impact on vehicle performance and safety.	5
<b>BME33506.5</b>	<b>Illustrate</b> applications of recent advances in automotive technology, for their impact on vehicle performance, safety, and efficiency.	3

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<b>Third Year (Semester-V) B. Tech. Mechanical Engineering</b>		
<b>BME33507: (PE-I) Smart Manufacturing</b>		

	Course Outcomes	CL
<b>BME33507.1</b>	<b>Interpret</b> the role of smart manufacturing's key enablers in enhancing production efficiency, quality, and innovation.	3
<b>BME33507.2</b>	<b>Explain</b> how Industry 4.0 transforms manufacturing processes and enables smart manufacturing.	4
<b>BME33507.3</b>	<b>Apply</b> artificial intelligence to manufacturing processes, to enhance efficiency, quality, and decision-making.	3
<b>BME33507.4</b>	<b>Analyze</b> automation technologies to fit for specific manufacturing production needs..	4
<b>BME33507.5</b>	<b>Evaluate</b> data-driven approaches in manufacturing, assessing their effectiveness in driving process improvement responsibility..	5

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**Third Year(Semester-V) B.Tech Mechanical Engineering**

**BBA33501: Business Development Formulation**



	Course Outcomes	CL
<b>BBA33501.1</b>	<b>Interpret</b> the fundamentals of business development, to drive innovation in engineering contexts.	3
<b>BBA33501.2</b>	<b>Summarize</b> key concepts of business model development to drive business growth and innovation.	5
<b>BBA33501.3</b>	<b>Analyze</b> product development processes, to determine their impact on product lifecycle and market success..	4
<b>BBA33501.4</b>	<b>Illustrate</b> financial and marketing planning principles, to enhance effective business strategies for engineering products and services..	3
<b>BBA33501.5</b>	<b>Explain</b> key concepts of intellectual property, to navigate the operational aspects of engineering business effectively.	4



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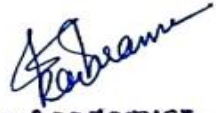


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<b>Third Year (Semester-V) B. Tech. Mechanical Engineering</b>		
<b>BME33508: Heat Transfer Lab</b>		



	Course Outcomes	CL
BME33508.1	<b>Analyze</b> the thermal conductivity of various engineering materials to determine their suitability for thermal applications.	4
BME33508.2	<b>Demonstrate</b> the performance of free convection heat transfer to determine influencing parameters through experimental and analytical methods.	3
BME33508.3	<b>Calculate</b> the performance of forced convection and condensation processes to determine heat transfer efficiency in thermal systems.	3
BME33508.4	<b>Analyze</b> radiation heat transfer mechanisms to find effective heat transfer systems and applications.	4
BME33508.5	<b>Illustrate</b> the importance of heat exchangers to enhance their role in energy efficiency and system performance in thermal systems	3

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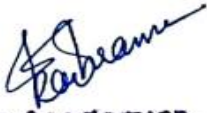


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<b>Third Year (Semester-V) B. Tech. Mechanical Engineering</b>		
<b>BME33509: Dynamics of Machine Lab</b>		

	Course Outcomes	CL
<b>BME33509.1</b>	<b>Demonstrate</b> the performance of gyroscope for the field applications.	3
<b>BME33509.2</b>	<b>Analyze</b> cam-follower dynamics to determine displacement, velocity, and acceleration characteristics.	4
<b>BME33509.3</b>	<b>Apply</b> the principles of dynamics to solve problems related to the balancing of rotating masses in mechanical systems.	3
<b>BME33509.4</b>	<b>Analyze</b> the performance characteristic curves of mechanical governors for their stability, sensitivity, and range for speed control in engines.	4
<b>BME33509.5</b>	<b>Compare</b> free and forced vibration characteristics in single and two degree-of-freedom systems, for their efficiency and dynamic behavior.	4

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<p align="center"><b>Third Year (Semester-V) B. Tech. Mechanical Engineering</b></p>		
<p align="center"><b>BME33510: Design of Machine Elements lab</b></p>		

	Course Outcomes	CL
<b>BME33510.1</b>	<b>Apply</b> principles of static loading to determine safe stresses on joints.	3
<b>BME33510.2</b>	<b>Analyze</b> the safe stress on welded joints under axial and eccentric loading conditions, cylinders and pressure vessels for optimal performance and safety, and power transmission shafts for efficient power transmission.	4
<b>BME33510.3</b>	<b>Calculate</b> the power transmission capacity of hollow and solid shafts using strength, rigidity, and failure theories.	3
<b>BME33510.4</b>	<b>Apply</b> principles of loading to determine safe stress on power screws and springs..	3
<b>BME33510.5</b>	<b>Summarize</b> safe stress considerations for clutches and brakes in automobile applications under various loading conditions.	5

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