

## Department of Mechanical Engineering

### Course Outcomes of all courses of B Tech 5<sup>th</sup> semester MECHATRONICS

On successful completion of this course, students should be able to

Course	COURSE OUTCOMES	
C301- Dynamics of Machines	C 301.1	<i>Apply knowledge</i> of Dynamics of machine for understanding, formulating and solving engineering problems. (Level 1,2)
	C 301.2	<i>Acquire knowledge</i> and hands-on competence in applying the concepts Dynamics of machine in the design and development of mechanical systems. (Level 1,3)
	C 301.3	<i>Demonstrate</i> creativeness in designing new systems components and processes in the field of engineering. (Level 1,3)
	C 301.4	<i>Identify, analyze</i> and solve mechanical engineering problems useful to the society. (Level 1,2,4,6)
	C 301.5	<i>Analyse</i> effectively with engineering and science teams as well as with multidisciplinary designs. (Level 1,2)

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Course	COURSE OUTCOMES	
C302- Fluid Machines and Fluidics	C302.1	Demonstrate the ability to test and analyze the performance of turbines such as Pelton wheel, Francis turbine, and Kaplan turbine. <b>Level (4)</b>
	C302.2	Perform testing and analysis of the performance of a two-stage reciprocating air compressor and air blower. <b>Level (4)</b>
	C302.3	Acquire knowledge about the operational principles and characteristics of turbines and pumps. <b>Level (2)</b>
	C302.4	Gain familiarity with the operational principles and applications of hydraulic machines. <b>Level (2)</b>
	C302.5	Understand the principles and functions of fluid systems in various applications. <b>Level (2)</b>

On successful completion of this course, students should be able to

Course	COURSE OUTCOMES	
303- Advance Microcontroller and System Design	C303.1	<b>Program to Solve</b> basic problems using 8051 microcontroller.[1,2,6]
	C303.2	<b>State</b> 8051 Counter/Timer and Interrupts features and applications machine automation. [1]
	C303.3	<b>Develop</b> understanding for using concepts of Serial Communication in machine to machine interface [5]
	C303.4	<b>Apply</b> fundamental knowledge about Embedded systems for better understanding of Machine automation [3]
	C303.5	<b>Analyze</b> interface between Microcontroller and various devices .[4]

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Course	COURSE OUTCOMES	
C304- Manufacturing Technology	C304.1	<i>understand</i> the basic concepts of heat treatment process and it's influences on properties of metal, types of ferrous and non-ferrous metal and its classification. <b>(Level-2)</b>
	C304.2	<i>define</i> and <i>classify</i> principles & application, advantages & limitations of various casting and welding processes. <b>.(Level-1,2)</b>
	C304.3	<i>understand, classify</i> the primary forming processes like forging , rolling, drawing, Extrusion <b>.(Level-2)</b>
	C304.4	<i>classify</i> and <i>understand</i> the principle and constructional features, operations performed on -lathe, drilling machine, shaper machine, planner machine, and slotter machine etc. <b>.(Level-2)</b>
	C304.5	<i>understand</i> the principle and operations and types of non-conventional machines and applications of press working operations. <b>(Level-2)</b>

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Course	COURSE OUTCOMES	
C305 Signals and Systems	C305.1	<i>describe</i> the properties of various types of signals and systems. <b>(Level 1,2,4 )</b>
	C305.2	<i>match</i> different types of continuous and discrete time signals to <i>design</i> the communication systems as per the requirement. <b>(Level 2,5 )</b>
	C305.3	<i>analyze</i> the behavior of the signal in different time domain and <i>interpret</i> the response of the systems. <b>(Level 3,4)</b>
	C305.4	<i>distinguish</i> between IIR and FIR Systems. <b>(Level 2)</b>
	C305.5	<i>evaluate</i> the role of correlation and convolution in the area of signal processing, and communication. <b>(Level 6)</b>

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Course	COURSE OUTCOMES	
C306- Dynamic Of Machine lab	C306.1	Analyze the vibration parameters of various systems. .(LEVEL 3)
	C306.2	Analyze gyroscopic parameters. .(LEVEL 3)
	C306.3	Analyze various types of governors. .(LEVEL 3)
	C306.4	Find the critical speed of different diameters of shafts. .(LEVEL 1,2)
	C306.5	Analyze the effects of unbalance in machine and methods to reduce/eliminate these effects. .(LEVEL 3)

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Course	COURSE OUTCOMES	
C307- Fluid Machines and Fluidics lab	C307.1	Analyze the performance parameters of Pelton Turbine. .(LEVEL 3)
	C307.2	Analyze the performance parameters of Francis and Kaplan Turbine.(LEVEL 3)
	C307.3	Analyze the performance parameters of Centrifugal Pump and Reciprocating Pump. .(LEVEL 3)
	C307.4	Determine Lift and drag force over an air foil. .(LEVEL 4)
	C307.5	Explain the construction and working of various fluidic devices. .(LEVEL 2)





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Course	COURSE OUTCOMES	
C308- System Design Lab	C308.1	Implement fundamental arithmetic operations in Assembly Language for Atmega16, including addition, subtraction, multiplication, and division of 8-bit numbers. Level: 3 (Application)
	C308.2	Develop proficiency in handling 16-bit unsigned numbers using Assembly Language on Atmega16 to perform addition operations and manage register pairs effectively. Level: 4 (Analysis)
	C308.3	Convert hexadecimal numbers to decimal representation using C language on a microcontroller, demonstrating knowledge of bitwise operations and register management. Level: 4 (Analysis)
	C308.4	Translate packed Binary-Coded Decimal (BCD) numbers into ASCII format using C language, applying logical operations and character encoding techniques. Level: 5 (Synthesis)
	C308.5	Develop applications in C language for microcontroller peripherals such as LCDs, keypads, stepper motors, temperature sensors, and servo motors, integrating hardware interfaces and control algorithms effectively. Level: 6 (Evaluation)

On successful completion of this course, students should be able to

Course	COURSE OUTCOMES	
C309- Project-I based on Summer Internship/ Industrial Training	C309.1	<b>Technical Skills Development</b> Students will be tasked with applying the technical skills they've acquired during their internship or training to solve real-world problems. This could involve implementing software solutions, conducting experiments, or troubleshooting technical issues encountered in the industry. <b>(Level: 3)</b>
	C309.2	<b>Problem-Solving Abilities</b> Students will analyze complex problems relevant to their field of study or industry. They will identify key issues, examine different approaches to problem-solving, and propose innovative solutions. This could involve case studies, simulations, or research-based projects. <b>(Level: 4)</b>
	C309.3	<b>Communication Skills Enhancement</b> Students will evaluate and improve their communication skills through project presentations, reports, or documentation. They will articulate their ideas, present findings, and defend their solutions effectively. Peer reviews and feedback sessions can be incorporated to enhance communication abilities. <b>(Level: 5)</b>
	C309.4	<b>Professional Development</b> Students will create a professional portfolio showcasing their achievements, experiences, and skills gained during the internship or training. They will reflect on their learning journey, set career goals, and develop a plan for continuous professional development. This could involve creating resumes, LinkedIn profiles, or personal branding materials. <b>(Level: 6)</b>
	C309.5	<b>Teamwork and Collaboration</b> Students will apply their teamwork and collaboration skills by working on group projects or collaborative assignments. They will demonstrate effective teamwork, leadership, and interpersonal skills while completing tasks and achieving project objectives. Group presentations or joint reports can be used to assess teamwork outcomes. <b>(Level: 3)</b>