



# AVANTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

(Approved by A.I.C.T.E., New Delhi, & Permanently Affiliated to J.N.T.U-GV, Vizianagaram)

NAAC "B++" Accredited Institute

Cherukupally (Village), Near Tagarapuvalasa Bridge, Vizianagaram (Dist) -531162.

www.aietta.ac.in, principal@aietta.ac.in

## Department of Mechanical Engineering

Program: M.Tech -CAD/CAM Course Outcomes

Regulation: R19

Course Outcomes

No. of Courses: 20

I-Sem	Course: Industrial Robotics
CO-1	Apply the manipulator design including actuator, drive and sensor issues.
CO-2	Analyze the forward kinematics, inverse kinematics and Jacobian for serial and parallel robots.
CO-3	Analyze the forward kinematics, inverse kinematics and Jacobian for serial and parallel robots.
CO-4	Develop programming principles and languages for a robot control system
CO-5	Assess various applications of industrial robot systems with cell controller.
I-Sem	Course: Computer Aided Manufacturing
CO-1	Explain the APT and NC programming on CAD/CAM systems.
CO-2	Organize the tooling for CNC machines for CNC machines and adaptive control of machining processes like turning, grinding
CO-3	Explain the general structure and functions of DAPP based post processor.
CO-4	Explain the general structure and functions of DAPP based post processor.
CO-5	Develop the AI & Expert systems to the computer aided process planning, computer aided testing and inspection methods.
I-Sem	Course: Special Manufacturing Processes
CO-1	Evaluate the required treatment necessary for a particular application
CO-2	Explain various stages involved in the processing of Ceramics.
CO-3	Apply the knowledge of various techniques for the fabrication of Micro Electronic Components
CO-4	Analyze the forces involved in various machining processes and adopt the suitable process for machining of the components of various strength materials.
CO-5	Apply the knowledge of various techniques and methods for the fabrication.
I-Sem	Course: Computational Methods In Engineering
CO-1	Explain the numerical techniques to find the roots of nonlinear equations and solution of system of linear equations.
CO-2	Solve the boundary and characteristic value problems for engineering applications.



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CO-3	Analyze the transformation techniques for engineering applications.
CO-4	Apply the principles of numerical Differentiation, Integration and numerical solutions of ordinary and partial differential equations to engineering applications
CO-5	Analyze the principles of partial differential equations to engineering applications. and call by reference
<b>I-Sem</b>	<b>Course: Mechanical Vibrations</b>
CO-1	Explain the concepts of vibration and single degree of freedom systems.
CO-2	Solve the obtained equations of motion to understand the various excitations such as harmonic excitation and impulse excitation.
CO-3	Examine vibration design of simple mechanical systems that can be approximated by multi degree of freedom systems
CO-4	Select appropriate numerical method for the solution of analytical problems in vibrations.
CO-5	Adapt the concepts of vibrations to solve engineering problems
<b>I-Sem</b>	<b>Course: Concurrent Engineering</b>
CO-1	Explain the concurrent engineering design methodologies.
CO-2	Identify and apply different computational techniques to the concurrent Engineering.
CO-3	Apply the concepts of product design by adopting different methods.
CO-4	Analyze the concepts of manufacturing which enhance the design process of manufacturing systems.
CO-5	Develop real-life new product/process scenarios.
<b>I-Sem</b>	<b>Course: - Design for Manufacturing and Assembly</b>
CO-1	DESIGN FOR MANUFACTURING AND ASSEMBLY
CO-2	Explain the functioning of solid state electronic devices.
CO-3	Teach about the hydraulic and pneumatic actuating systems.
CO-4	Analyze the measuring of physical quantities using digital electronics and systems
CO-5	Create system interfacing and data acquisition.
<b>I-Sem</b>	<b>Course: Computer Aided Process Planning</b>
CO-1	Describe the structure and advantages of Automated process planning system



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CO-2	Apply the principles of generative, retrieval CAPP systems and Group technology which helps in reducing cost and improving quality.
CO-3	Calculate the tolerances and understand its importance in manufacturing
<b>I-Sem</b>	<b>Course: Advanced CAD Lab</b>
CO-1	Describe the modeling and FE analysis of trusses, beams, plates and cylinders
<b>II-Sem</b>	<b>Course: Optimization and Reliability</b>
CO-1	Apply Principles of optimization and conventional optimization techniques to various problems
CO-2	Apply numerical methods for optimization to optimization related problems
CO-3	Apply genetic algorithm and genetic programming
CO-4	Apply and Solve optimization in design and manufacturing systems
CO-5	Illustrate reliability concepts
<b>II-Sem</b>	<b>Course: Advanced Finite Element Methods</b>
CO-1	Analyze the structures by using the various methods to calculate stiffness.
CO-2	Analyze the axial bar, trusses and Beams structures
CO-3	Evaluate the stiffness matrix of 2-D structures by using CST, LST, Isoparametric, quadrilateral element.
CO-4	Evaluate the stiffness matrix of 3-D structures and 1-D, 2-D heat conduction slabs.
CO-5	Evaluate the mass matrix and natural frequencies of dynamic systems.
<b>II-Sem</b>	<b>Course: Quality Engineering in Manufacturing</b>
CO-1	Explain quality engineering in manufacturing
CO-2	Apply parameter and tolerance design for some of the case studies
CO-3	analyze ANOVA for four level and multi level factors
CO-4	analyze Orthogonal arrays for Designing and Experimentation
CO-5	analyze Orthogonal arrays for Designing and Experimentation
<b>II-Sem</b>	<b>Course: Fracture Mechanics</b>
CO-1	Analyze the fracture behaviour in ductile and brittle materials.



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CO-2	Analyze the stress concentration and critical stress factor
CO-3	Analyze the stress concentration and critical stress factor
CO-4	Analyze the stress concentration and critical stress factor
CO-5	Determine the creep damage and creep deformation maps.
<b>II-Sem</b>	<b>Course: Flexible Manufacturing Systems</b>
CO-1	Explain flexible manufacturing systems
CO-2	Apply the different flexible manufacturing systems to the industrial applications
CO-3	Analyze the different process layouts and their salient features
CO-4	Explain different material handling Systems and their applications
CO-5	Explain different material handling Systems and their applications
<b>II-Sem</b>	<b>Course: Mechanics and Manufacturing Methods of Composites</b>
CO-1	Explain mechanics and manufacturing methods of composites
CO-2	Analyze the Micromechanics and Coordinate transformations of the composite materials.
CO-3	Illustrate the Elastic behavior and strength of unidirectional composites
<b>II-Sem</b>	<b>Course: Rapid Prototyping</b>
CO-1	Describe the fundamentals & applications of rapid prototyping process.
CO-2	Describe the fundamentals & applications of rapid prototyping process.
CO-3	Describe the fundamental & applications of rapid prototyping process.
CO-4	Select the appropriate fabrication technique in solid based rapid prototyping systems.
CO-5	Solve resolution, accuracy, hardening issues in rapid prototyping processes.
<b>II-Sem</b>	<b>Course: Intelligent Manufacturing Systems</b>
CO-1	Discuss the concepts of computer integrated manufacturing systems and manufacturing communication systems
CO-2	Identify various components of knowledge based systems
CO-3	Analyze the concepts of artificial intelligence, artificial neural networks and its applications in manufacturing



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CO-4	Select the systems for process planning and manufacturing equipment using knowledge based system.
CO-5	Apply various methods to solve group technology problems and demonstrate the structure for knowledge based system for group technology.
<b>II-Sem</b>	<b>Course: Advanced CAM Lab</b>
CO-1	Describe the metal removal processes on lathe and milling machines
CO-2	Describe metal removal processes on lathe and milling machines
CO-3	Execute the part program and machine the component as per the production drawing
<b>III-Sem</b>	<b>Course: Geometric Modeling</b>
C0-1	Explain the coordinate system for the development of parametric and geometric forms of curves.
C0-2	Develop and manipulate the curves like splines and Bezier curves using parametric equations.
C0-3	Develop and manipulate the B- splines curves using parametric equations.
C0-4	Develop and manipulate the curves and surfaces using parametric equations.
C0-5	Develop and manipulate the solid models using different modeling approaches along with wireframe models.
<b>III-Sem</b>	<b>Course: Product Design and Development</b>
C0-1	Select an appropriate product design and development process for a given application
C0-2	Define the components and their functions of product design and development processes and their relationships from concept to customer over whole product lifecycle.
C0-3	Select an appropriate standardization method to analyze, evaluate and apply the methodologies for product design, development.
C0-4	Undertake a methodical approach to the management of product development to satisfy customer needs.
C0-5	Compare cost and benefit analysis through various cost models



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Bhogapuram (M), Vizianagaram (D)-531162