

P.S.N. College of Engineering And Technology
Department of Mechanical & Automation Engineering
Course Outcomes
Curriculum Regulation 2018

501001- Technical English	
CO	COURSE OUTCOMES
CO.1	Write cohesively and coherently and flawlessly avoiding grammatical errors
CO.2	Listen/view and comprehend different Spoken discourses/excerpts in different accents
CO.3	Communicate with one or many listeners' using appropriate communicative strategies
CO.4	Read different genres of texts adopting various reading strategies
CO.5	Writing skills enable a student o write comprehend passages, report and paragraph
Course Name: 501002- Elementary Mathematics for Engineers	
CO	COURSE OUTCOMES
CO.1	Find the Eigen values and Eigen vectors by matrix methods.
CO.2	Understand different types of sequences of series and their convergence.
CO.3	Know the concepts of differentiation and integration and applications of indefinite integral.
CO.4	Form and solve the inequalities by LPP and solve transportation problems.
CO.5	Understand the concepts of three dimension and form the equations of tangent plane, cone.
Course Name: 501003- Applied Physics I	
CO	COURSE OUTCOMES
CO.1	Understand the properties of different types of metals
CO.2	Gain knowledge about conductivity of different types of materials
CO.3	Study about magnetism property of the materials

CO.4	Know the applications of sound waves in engineering & medicine
CO.5	Understand the application of laser in engineering & medicine
Course Name: 501004- Applied Chemistry I	
CO	COURSE OUTCOMES
CO.1	Do water Treatment for domestic & industrial purpose
CO.2	Study different kinds of advanced materials and their applications
CO.3	Study different kinds of polymers & their applications
CO.4	Basics of thermo dynamics and its concept
CO.5	Familiar with name materials & their applications in different fields
Course Name: 501005- Engineering Graphics	
CO	COURSE OUTCOMES
CO.1	. Perform free hand sketching of basic geometrical shapes and multiple views of objects.
CO.2	Draw orthographic projections of lines, planes and solids
CO.3	Obtain development of surfaces.
CO.4	Prepare isometric and perspective views of simple solids.
Course Name: 501006- Fundamentals of Computers and Python Programming	
CO	COURSE OUTCOMES
CO.1	Have fundamental knowledge on basics of computers and Number System
CO.2	Work on MS-Office
CO.3	Write, compile and debug simple programs in Python

CO.4	Understand the concept of functions in Python
CO.5	Use different Compound data types in Python.

Course Name: 501101- Applied Physics & Chemistry Lab - I	
CO	COURSE OUTCOMES
CO.1	Gain practical knowledge by applying the experimental methods to correlate with physics and chemistry theory.
CO.2	Able to gain Working knowledge of fundamental Physics and chemistry.
CO.3	Ability to apply the design process to engineering application.

Course Name: 501102- Computer Lab	
CO	COURSE OUTCOMES
CO.1	Create and edit their own documents, sheets and presentations
CO.2	Write their own programs to solve problems by using Python

Course Name: 501103- Workshop Practice	
CO	COURSE OUTCOMES
CO.1	Apply the knowledge of pipeline connections to household fittings and industrial buildings.

CO.2	Prepare the different joints in roofs, doors, windows and furniture.
CO.3	Perform the various welding processes and know about its applications.
CO.4	Produce a tray and funnel using sheet metal.
CO.5	Prepare square fitting and “V” fitting

Course Name: 501007- Business Communication and Presentation Skills

CO	COURSE OUTCOMES
CO.1	Communicate with one or many listeners’ by using effective business communication.
CO.2	Create formal reports and proposals cohesively and creatively and flawlessly.
CO.3	Understand basic communicative mannerisms, cultural factors and emotional intelligence.
CO.4	Develop and deliver powerful presentation and confidence in public speaking.
CO.5	Produce resumes and cover letters.

Course Name: 501009- Applied Physics II

CO	COURSE OUTCOMES
CO.1	Find the energy of small particle
CO.2	Find the structure of different material in different temperature
CO.3	Study different types of fiber optics used in communication systems
CO.4	Gain knowledge on the thermal properties of different types of materials
CO.5	Study the engineering applications of magnetic materials

Course Name: 501010- Applied Chemistry II

CO	COURSE OUTCOMES
CO.1	Know the Principles & applications of electro chemistry
CO.2	Understand about corrosion & its protection techniques
CO.3	Gain Knowledge about materials used in energy production
CO.4	To study the properties of different kinds of alloys & its application
CO.5	Understand various instrumental techniques for sample processing

Course Name: 501011- Engineering Mechanics

CO	COURSE OUTCOMES
CO.1	Illustrate the vectorial and scalar representation of forces and moments
CO.2	Evaluate the properties of surfaces and solids
CO.3	Analyze the different type of motion
CO.4	Determine the friction and the effects by the laws of friction
CO.5	Calculate dynamic forces exerted in rigid body

Course Name: 501012- Programming in C

CO	COURSE OUTCOMES
CO.1	Have fundamental knowledge on C language
CO.2	Design programs involving decision structures, loops and functions.
CO.3	Define small functions for solving complex applications
CO.4	Write, compile and debug programs in C language using Arrays.

CO.5	. Understand the concept of Structure and Union
Course Name: 501013- Basic Engineering (Coming under EEE Board)	
CO	COURSE OUTCOMES
CO.1	Explain the usage of construction material and proper selection of construction materials and also measure distances and area by surveying
CO.2	Understand the basics of Energy Sources and Power Generation
CO.3	Acquire the knowledge about various manufacturing processes.
CO.4	Solve simple circuits and express the concept of fundamentals of circuits
CO.5	Express the function of semiconductor devices and develop the truth tables of logic gates.
Course Name: 501104- Applied Physics & Chemistry Lab II	
CO	COURSE OUTCOMES
CO.1	Gain practical knowledge by applying the experimental methods to correlate with physics and chemistry theory.
CO.2	Apply the various procedures and techniques for the experiments.
CO.3	Apply the various procedures and techniques for the experiments.
CO.4	Develop basic communication skills through working in groups in performing the laboratory experiments and by interpreting the results.
CO.5	Ability to use the different measuring devices and meters to record the data with precision.
Course Name: 501105- C Programming Lab	
CO	COURSE OUTCOMES
CO.1	Able to solve simple problems using C' Language
CO.2	Able to execute programs using control statements
CO.3	Able to handle arrays in C' Programs
CO.4	Able to write functions and to solve some complicated problems in C

Course Name: 501106-Basic Electrical and Electronics Lab	
CO	COURSE OUTCOMES
C 201.1	Design House wiring system
C 201.2	Measure the various Electrical Quantities in a circuit
C201.3	Attend the trouble shooting of electrical equipments
C201.4	Check the status of Semiconductor devices
C201.5	Check the Functioning of Logic Gates
Course Name: 501014- Engineering Mathematics – II	
CO	COURSE OUTCOMES
CO.1	
CO.2	
CO.3	
CO.4	
CO.5	
Course Name: 509001- Engineering Materials and Metallurgy	
CO	COURSE OUTCOMES
CO.1	Identify the micro-structures and properties of materials
CO.2	construct the phase diagrams of various solid solutions and to identify the presence of various phases with the addition of alloying elements.
CO.3	Discuss various heat-treatment procedures for specific applications
CO.4	Categorize the plastics, ceramics and composites to replace metallic materials in several machineries
CO.5	Classify various properties of materials and to identify appropriate materials for different applications and environmental conditions
Course Name: 509002- Fluid Mechanics and Machinery	
CO	COURSE OUTCOMES
CO.1	State and explain various fluid properties.

CO.2	Apply the knowledge of fluid statics for solving the problems in buoyancy and manometers.
CO.3	Solve problems in mass, momentum and energy balance equations in fluid dynamics.
CO.4	Analyse the fluid flow problems through pipes.
CO.5	Analyse the performance of turbines and pumps.

Course Name: 509101- Production Technology Lab- I

CO	COURSE OUTCOMES
CO.1	Contrast the casting process, to classify the various casting processes and to identify the various casting defects
CO.2	Explain various welding, brazing and analyze the effect of thermal cutting process
CO.3	Illustrate various bulk deformation processes and able to design bulk deformation components
CO.4	Categorize the metal forming manufacturing processes
CO.5	Judge the cutting tool to be chosen, to measure the tool life, to compare various machines for machining processes and to choose the working holding and tool holding devices for the machines and machining processes

Course Name: Electronic Devices and Circuits .

CO	COURSE OUTCOMES
CO.1	Analyse the characteristics of the p-n junction diodes
CO.2	Analyse the characteristics of transistors
CO.3	Explain their understanding about the behavior of power control devices
CO.4	Explain the functioning of optoelectronic devices

CO.5	Design diode based circuits for the given specifications
Course Name: 509102- Solid Mechanics and Fluid Mechanics Lab.	
CO	COURSE OUTCOMES
CO.1	Perform tensile and torsion test for mild steel (MS) specimen
CO.2	Conduct hardness test for different metals and carry out impact test for MS specimen
CO.3	Determine deflection in beams and calculate the stiffness of spring.
CO.4	Determine the discharge coefficient for Venturi and Orifice meter
CO.5	Calculate the frictional loss through pipes and draw the characteristic curves for pumps and Evaluate the performance of turbines and verify Bernoulli's theorem
Course Name: 501109- Career Skill Development Training-I	
CO	COURSE OUTCOMES
CO.1	
CO.2	
CO.3	
CO.4	
CO.5	
Course Name: 501801- Environmental Studies	
CO	COURSE OUTCOMES
CO.1	
CO.2	
CO.3	
CO.4	
CO.5	
Course Name: 501020- Engineering Mathematics – III (Transformation Techniques & Application of PDEs.)	
CO	COURSE OUTCOMES

CO.1	
CO.2	
CO.3	
CO.4	
CO.5	
Course Name: 509005- Production Technology – II	
CO	COURSE OUTCOMES
CO.1	Recognize the need and importance of Non-traditional process and its selection based on the parameters, shapes
CO.2	Distinguish the principle, process parameters of abrasive water jet machining and ultrasonic machining process.
CO.3	Describe the process involved in the electrical discharge machining and analyze for making complex profile in hard metals.
CO.4	Describe the process involved chemical and electro chemical machining process the appropriate high energy machining process for the various materials
CO.5	Describe the process involved thermal energy machining processes Understand the fundamentals off engineering applications
Course Name: 509006- Electrical Drives and Control	
CO	COURSE OUTCOMES
CO.1	
CO.2	
CO.3	
CO.4	
CO.5	
Course Name: 509007- Mechanics of Machines	
CO	COURSE OUTCOMES
CO.1	Discuss the basics of mechanism, Calculate velocity and acceleration in simple mechanisms
CO.2	Develop CAM profiles and Solve problems on gears and gear trains.

CO.3	Compute the Gyroscope effect of ships ,cars and aircrafts
CO.4	Calculate the balancing masses and their locations of reciprocating and rotating masses.
CO.5	Compute the frequency of free vibration, forced vibration and damping coefficient.

Course Name: 509008- Hydraulics and Pneumatics

CO	COURSE OUTCOMES
CO.1	Apply dimensional analysis to develop mathematical modeling and compute the parametric values in prototype by analyzing the corresponding model parameters.
CO.2	Design of open channels of various cross sections including economical channel sections.
CO.3	Apply energy concepts to flow in open channel sections, Calculate energy dissipation, and Compute water profile at different conditions.
CO.4	Design turbines for the given data, and to know their operation characteristics under different operating conditions.
CO.5	Design and trouble shoot the hydraulic and pneumatic circuits for applications.

Course Name: 509009- LAN & Networking

CO	COURSE OUTCOMES
CO.1	Students get good understanding in the fundamentals of network concepts, reference model
CO.2	Students get good knowledge in different types of medium and fundamental of data link layer.
CO.3	Students get the basic concepts of Ethernet and technologies.
CO.4	Students get good knowledge in different types of networking devices
CO.5	Students can able to understand different types of application layers.

Course Name: 501113- Career Skill Development Training-II

CO	COURSE OUTCOMES
CO.1	
CO.2	
CO.3	
CO.4	

CO.5	.
Course Name: 509101- Computer Aided Drafting and Machine drawing Lab	
CO	COURSE OUTCOMES
CO.1	To make the students understand and interpret drawings of machine components
CO.2	To prepare assembly drawings both manually and using standard CAD packages
CO.3	To familiarize the students with Indian Standards on drawing practices and standard components
CO.4	To gain practical experience in handling 2D drafting.
CO.5	To gain practical experience in handling 3D modeling software systems
Course Name: 509103- LAN & Networking Lab	
CO	COURSE OUTCOMES
CO.1	Students get good understanding in the fundamentals of network concepts, reference model
CO.2	Students get good knowledge in different types of medium and fundamental of data link layer.
CO.3	Students get the basic concepts of Ethernet and technologies.
CO.4	Students get good knowledge in different types of networking devices
CO.5	Students can able to understand different types of application layers.
CourseName: 509104- Electrical Drives and Control Lab	
CO	COURSE OUTCOMES
CO.1	
CO.2	
CO.3	
CO.4	
CO.5	
Course Name: 509010- Applied Mathematics – IV (Probability & Statistics)	
CO	COURSE OUTCOMES

CO.1	
CO.2	
CO.3	
CO.4	
CO.5	

Course Name: 509011- Design of Machine Elements

CO	COURSE OUTCOMES
CO.1	Solve simple stresses in beams, hooks and shafts.
CO.2	Design shafts, keys and couplings for power transmission.
CO.3	Estimate load carrying capacity of threads and welds joints.
CO.4	Analyze, understand and design flexible transmission elements such as belt, chain and wire ropes.
CO.5	Interpret and design spur gear drive for different application and analyze the same for various applications

Course Name: 509012- Engineering Metrology & Measurements

CO	COURSE OUTCOMES
CO.1	Apply the knowledge of measuring instruments in industry for selecting appropriate instruments.
CO.2	Suggest the linear measuring instruments for measuring dimension with high accuracy.
CO.3	Design tolerances and fits for selected product quality.
CO.4	Evaluate the quality of the machine tool with alignment test.
CO.5	Utilize the mechanical measuring instruments in industries for sequence applications.

CourseName: 509013- Thermal Science & Engineering

CO	COURSE OUTCOMES
CO.1	Illustrate the basic concepts for solving problems in open and closed system by using Laws of Thermodynamics.

CO.2	Understand the Limitations, applications and Comparison of Thermodynamic cycles based on different parameters and communicate effectively the concepts of internal combustion engines.
CO.3	Estimate the condition of steam and performance of vapour power cycles.
CO.4	Analysis the ideal cycle and estimate thermal efficiency and Illustrate the significance of thermodynamics relation.
CO.5	Use psychrometric Charts and Estimate various essential properties related to psychrometric and processes.

CourseName: 509014- CAD & CAM

CO	COURSE OUTCOMES
CO.1	Explain the 2D and 3D transformations, clipping algorithm, Manufacturing models and Metrics
CO.2	Create and manipulating geometric models using curves, surfaces, solid and to apply concept of CAD systems for 3D modeling and visual realism.
CO.3	Create and adding geometric tolerances in assembly modeling and to Apply standard CAD practices in engineering design.
CO.4	Describe basic concepts of CAM application and understand CAM wheel
CO.5	Prepare CNC programs for manufacturing of different geometries on milling and lathe machines.

Course Name: 501115- Career Skill Development Training-III

CO	COURSE OUTCOMES
CO.1	Acquire skills and knowledge in CATIA and Solve space.
CO.2	Understand the basic automobile maintenance and overhauling concepts .

Course Name: 509105- Dynamics and Metrology Lab

CO	COURSE OUTCOMES
CO.1	Choose the proper measuring instruments for the measurement of pressure, temperature, linear distance, speed and surface finish etc., using calibration technique
CO.2	Identify the composite error of gear tooth using gear tooth tester,
CO.3	Demonstrate the measurement of tool tip temperature, thread components, angular components
CO.4	Analyze various types of transmission, apply balancing in machine systems
CO.5	Analyze various types of CAMS and gears

Course Name: 509106- CAD & CAM Lab

CO	COURSE OUTCOMES
CO.1	Draw 3D and Assembly drawing using CAD software
CO.2	Demonstrate manual part programming with G and M codes using CAM
CO.3	Create 3D Parts using 3D printer
Course Name: 509107- Thermal Science and Engineering Lab	
CO	COURSE OUTCOMES
CO.1	Give experimental knowledge on the performance and operations of I.C. Engines
CO.2	Impart knowledge about testing the engines,
CO.3	Fuel characteristics and applications include conduction, convection and radiation experiments.
Course Name: 509802- Human Rights & Value Education	
CO	COURSE OUTCOMES
CO.1	
CO.2	
CO.3	
CO.4	
CO.5	

Course Name: 509015- Operation Research

CO	COURSE OUTCOMES
CO.1	
CO.2	
CO.3	
CO.4	
CO.5	

Course Name: 509016- Heat and Mass Transfer

CO	COURSE OUTCOMES
CO.1	Apply basic principles of heat transfer for solving problems and demonstrate fundamentals principles of heat transfer in practice
CO.2	Solve free and forced convection problems using correlations and perform experimentation
CO.3	Analyse the performance of heat exchangers and demonstrate in practice.
CO.4	Evaluate radiation problems using perform correlations and experimentation
CO.5	Assess different mass transfer systems

Course Name: 509017- Control System Engineering

CO	COURSE OUTCOMES
CO.1	
CO.2	
CO.3	
CO.4	
CO.5	

Course Name 509018- Mechatronics	
CO	COURSE OUTCOMES
CO.1	Discuss the interdisciplinary applications of Electronics, Electrical, Mechanical and Computer Systems for the Control of Mechanical, Electronic Systems and sensor technology.
CO.2	Discuss the architecture of Microprocessor and Microcontroller, Pin Diagram, Addressing Modes of Microprocessor and Microcontroller.
CO.3	Discuss Programmable Peripheral Interface, Architecture of 8255 PPI, and various device interfacing
CO.4	Explain the architecture, programming and application of programmable logic controllers to problems and challenges in the areas of Mechatronic engineering.
CO.5	Discuss various Actuators and Mechatronics system using the knowledge and skills acquired through the course and also from the given case studies
Course Name: Career Skill Development Training-IV	
CO	COURSE OUTCOMES
CO.1	Acquire skills and knowledge in NX and CFD basics.
CO.2	Apply knowledge on Welding technology and industrial safety methods
Course Name: 509108- Mechatronics Lab	
CO	COURSE OUTCOMES
CO.1	Demonstrate the functioning of mechatronics system with various pneumatic, hydraulic and electrical systems.
CO.2	Demonstrate the functioning of control systems with the help of PLC and microcontrollers.
Course Name: 509109- Control System Engineering Lab	
CO	COURSE OUTCOMES
CO.1	
CO.2	
CO.3	
CO.4	
CO.5	

Course Name: 509901- Non Destructive Examination(Open Elective)	
CO	COURSE OUTCOMES
CO.1	Connect the usage of Non-Destructive Examination in minimizing the cost over preferring conventional destructive testing
CO.2	Illustrate the principles of operation of liquid penetrant and magnetic particle tests.
CO.3	Identify the method of finding internal defects and other properties through radiography techniques.
CO.4	Examine the application of ultrasonic and acoustic emission techniques in a real time environment.
CO.5	Illustrate the advancements in nondestructive testing methods and equipment's.
Course Name: 509902- Industrial Automation & Robotics(Open Elective)	
CO	COURSE OUTCOMES
CO.1	Understand the basics and limitations of hydraulic and Pneumatic System.
CO.2	Design and Programming the Robots for Manufacturing Operations.
CO.3	Describe and explain 3D translation and orientation representation & Illustrate the robot arm kinematics and use of Robot Operating System usage.
CO.4	Select & identify suitable automation hardware for the given Transmission System.
CO.5	Design / Simulate a robot which meets kinematic requirements.
Course Name: 509903- Industrial Safety(Open Elective)	
CO	COURSE OUTCOMES
CO.1	Examine the factors that lead to an accident
CO.2	Select the safety equipment to be used for prevention of various hazards
CO.3	Identify the various possible hazards in Fire protection engineering
CO.4	Use the knowledge gained for maintaining safety, occupational health and hygiene in an industry
CO.5	Plan the safety measures appropriate for an industry through regulations
Course Name: 509201- Metal Cutting & Tool Design (Elective-I)	

CO	COURSE OUTCOMES
CO.1	Understand the factors of different machining processes and apply mechanics of machining process to evaluate machining time.
CO.2	Describes the basic mechanism of metal cutting and develop the relations for chip reduction coefficient, shear angle, shear strain, forces, power, specific energy and temperatures associated with orthogonal cutting.
CO.3	Select cutting fluids, cutting tool materials and tool geometry for improving machinability and tool life.
CO.4	Illustrate the various processes involved in grinding machines and describe the principles of Gear Cutting machines.
CO.5	Explain the construction and specification of various machine tools and its materials, tool nomenclature and surface finish.

CourseName: 509202- Design of Jigs, Fixtures & Press Tools (Elective-I)

CO	COURSE OUTCOMES
CO.1	Demonstrate the purpose and functions of jigs and fixtures.
CO.2	Design and develop jigs and also jig-less manufacturing.
CO.3	Explain various fixture assemblies, design, develop and inspect fixtures.
CO.4	Analyze the press working and strip layout process.
CO.5	Evaluate the design and development of progressive and compound dies for various applications.

Course Name: 509203- Computational Fluid Dynamics (Elective-I)

CO	COURSE OUTCOMES
CO.1	Apply the theory of Computational Fluid Dynamics for different types of fluid flow.
CO.2	Apply finite difference methods in real time applications
CO.3	Create algorithm for fluid flow problems using finite volume approach.
CO.4	Solve one and two dimensional flow problems using finite element method.
CO.5	Analyze the flow situations using CFD results

Course Name: 509204- Principles of Management (Elective-I)

CO	COURSE OUTCOMES
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CO.1	Elaborate the basic concepts of management and types of organizations
CO.2	Identify the process of planning tools and explain the decision making processes.
CO.3	Demonstrate the HRM process for making effective organization
CO.4	Explain the leadership qualities and motivation theories.
CO.5	Demonstrate the controlling process related to computers
Course Name: 509205 - Unconventional Machining Processes (Elective-I)	
CO	COURSE OUTCOMES
CO.1	Explain the need for unconventional machining processes and its classification
CO.2	Compare various thermal energy and electrical energy based unconventional machining processes
CO.3	Summarize various chemical and electro-chemical energy based unconventional machining processes
CO.4	Explain various nano abrasives based unconventional machining processes
CO.5	Distinguish various recent trends based unconventional machining processes
Course Name: 509206- Additive Manufacturing(Elective-I)	
CO	COURSE OUTCOMES
CO.1	Demonstrate the knowledge of Additive Manufacturing and Rapid Prototyping technologies
CO.2	Describe different RP techniques.
CO.3	Identify the suitable manufacturing Methodology for Additive Manufacturing
CO.4	Design and develop modeling of rapid prototyping
CO.5	Discuss fundamentals of Reverse Engineering
Course Name: 509207- Flexible Manufacturing System (Elective-I)	
CO	COURSE OUTCOMES
CO.1	Classify and distinguish FMS and other manufacturing systems including job-shop and mass production systems.
CO.2	Explain processing stations and material handling systems used in FMS environments.

CO.3	Design and analyze FMS using simulation and analytical techniques.
CO.4	Understand tool management in FMS.
CO.5	Analyze the production management problems in planning, loading, scheduling, routing and breakdown in a typical FMS.