

Course Outcomes: Students should be able to	
First Year (FE) Mechanical Engineering (Curriculum 2015 Pattern)	
Semester-I	
Subject	Engineering Mathematics - I
Subject Code	107001
Course Outcome (COs)	
107001.1	calculate rank of matrix & eigenvalue and eigenvector
107001.2	solve complex mathematical problem by hyperbolic and logarithmic function
107001.3	Determine higher derivatives of functions , and test for convergence of infinite series
107001.4	Determine limits and the expansion of functions in ascending power of variable
107001.5	solve problems on partial derivative and its application
107001.6	Find maxima and minima, Error Analysis by using Jacobian.
107001	Engineering Mathematics - I
Subject	
Engineering Physics	
Subject Code	107002
Course Outcome (COs)	
107002.1	Understand the basic concepts of interference of waves and basic concepts of diffraction of waves.
107002.2	Understand the concepts of Sound Engineering and the concepts and properties of ultrasonic waves.
107002.3	Understand the mechanism of Laser and the applications of Laser in communication system and the concept of polarization and how to use in LCD ,in wrist watches, Calculators, TV screens etc.
107002.4	Understand the concepts of semiconductors and how to use in p-n junction device as a Solar cell, Transistor and in Hall
107002.5	Understand the concept of wave particle duality of radiation and matter and how to use in applications of Schrodinger's time independent wave equation to problems of (i) Particle in rigid box (ii) Particle in non rigid box.
107002.6	Understand the properties and types of superconductors and the concepts and properties of Nanoparticles.
Subject	
Fundamentals of Programming I	
Subject Code	110003
Course Outcome (COs)	
110003.1	Understand the basic concepts of interference of waves and basic concepts of diffraction of waves.
110003.2	Understand the concepts of Sound Engineering and the concepts and properties of ultrasonic waves.
110003.3	Understand the mechanism of Laser and the applications of Laser in communication system and the concept of polarization and how to use in LCD ,in wrist watches, Calculators, TV screens etc.

110003.4	Understand the concepts of semiconductors and how to use in p-n junction device as a Solar cell, Transistor and in Hall
110003.5	Understand the concept of wave particle duality of radiation and matter and how to use in applications of Schrodinger's time independent wave equation to problems of (i) Particle in rigid box (ii) Particle in non rigid box.
110003.6	Understand the properties and types of superconductors and the concepts and properties of Nanoparticles.
Subject	Basic Electrical Engineering
Subject Code	103004
Course Outcome (COs)	
103004.1	To understand the concept of conversion of energy from one form to another.
103004.2	Knowledge of electrical and magnetic circuits using Faradays laws of electromagnetic induction.
103004.3	Knowledge and including design of experiments, analysis and numerical on single phase transformer.
103004.4	To study the fundamentals of AC their mathematical and graphical representation.
103004.5	To design the different types of load with experiment, solving and analyzing the balanced star delta connected load in
103004.6	To calculate the electrical load using laws and theorem
Subject	Basic Civil & Environmental Engineering
Subject Code	101005
Course Outcome (COs)	
101005.1	Use of different construction materials in Civil Engineering structures.
101005.2	Understand technique of GIS and GPS. Use of different advanced instruments used in civil engineering projects.
101005.3	Understand importance of Environment Need for conserving natural resources and preserving the environment and
101005.4	Understand Concept of an integrated built environment, Principles of planning, Use of various eco friendly materials in construction and Role of Bye laws in regulating the environment.
101005.5	Acquire knowledge of Conventional and Non-conventional energy sources, types of pollution and its sources . suggest
101005.6	Use of different construction materials in Civil Engineering structures.
Subject	Engineering Graphics I
Subject Code	102006
Course Outcome (COs)	
102006.1	Student will be able to know and use of different drawing instruments ,sheets,types of lines,dimensioning,projections of points and also able to solve the problems on projections of lines
102006.2	Student will be able to know , understand and solve the problems on projections of planes
102006.3	Student will be able to know , understand and solve the problems on projections of solids

102006.4	Student will be know ,understand and draw various engg.curves and methods used in Engineering drawing and their applications,also able to develop surfaces which enables to design and fabricate surfaces of different sheet metals.
102006.5	Student will be able to understand the theory of projection and use the principles of orthographic projections
102006.6	Student will be able to draw isometric view and isometric projection from orthographic views.
Subject	Workshop Practices
Subject Code	111007
Course Outcome (COs)	
111007.1	Able to identify the fundamental tools, equipment, machineries.
111007.2	Able to use of tools, equipment's, machineries.
111007.3	Able to gain the drawing rules.
111007.4	Able to identify the measuring instruments for measurement.
111007.5	Able to understand the manufacturing operations.
111007.6	Able to identify the properties of tool, materials.

Semester-II

Subject	Engineering Mathematics II
Subject Code	107008
Course Outcome (COs)	
107008.1	Solve problems on First order Differential Equations.
107008.2	Develop a skill for mathematical modeling of application of Differential Equations in engineering.
107008.3	Expand function by Fourier series and Evaluation of integral by beta and gamma function in various engineering areas.
107008.4	Apply advanced techniques to evaluate integrals and To Draw approximate shape of curves using knowledge of curve
107008.5	To apply 3D geometry in different area of engineering such as Electromagnetic field , vector calculus.
107008.6	Use knowledge of multiple integral for area volume, C G, M I.etc.
Subject	Engineering Chemistry
Subject Code	107009
Course Outcome (COs)	
107009.1	Understand use of different technology of water analysis for industrial purpose .
107009.2	Understand calibration and handling of various instrument with the help of laws.
107009.3	Apply use of biodegradable polymer for preventing pollution.
107009.4	Apply use of derived fuel as future prospect.

107009.5	Apply use of nanomaterial and composite material as modern aspect
107009.6	Understand implementation of corrective measures to minimize corrosion
Subject	Fundamentals of Programming II
Subject Code	110010
Course Outcome (COs)	
110010.1	To understand the basic terminology used in computer programming.
110010.2	To write, compile and debug programs in C, C++, JAVA, HTML language.
110010.3	To study concept of embedded programming and develop application using embedded programming.
110010.4	Able to use open source operating system installation and develop android application.
Subject	Engineering Mechanics
Subject Code	107011
Course Outcome (COs)	
107011.1	Should be able to identify the different force systems and their effects on the bodies at rest.
107011.2	Should be able to identify the type of motion of the body and use the appropriate case for the analysis.
107011.3	Should be able to identify and analyse the various cases of curvilinear motion.
107011.4	Should able to apply the principle of work-Energy.
107011.5	Should be able to identify the different types of beams and loading on beams .
107011.6	Should be able to analyse the truss and practical application of truss in different structures.
Subject	Basic Electronics Engineering
Subject Code	104012
Course Outcome (COs)	
107012.1	To understand the concept of conversion of energy from one form to another.
107012.2	Knowledge of electrical and magnetic circuits using Faradays laws of electromagnetic induction.
107012.3	Knowledge and including design of experiments, analysis and numerical on single phase transformer.
107012.4	To study the fundamentals of AC their mathematical and graphical representation.
107012.5	To design the different types of load with experiment, solving and analyzing the balanced star delta connected load in
107012.6	To calculate the electrical load using laws and theorem
Subject	Basic Mechanical Engineering

Subject Code	102013
Course Outcome (COs)	
107013.1	To acquire basic knowledge and function of machine elements like shafts, bearings, couplings and various power transmission devices like belt, chain and gear drives along with problems based on it.
107013.2	Understand the fundamentals the theory of kinematics, motion of machines and different mechanisms used in industrial
107013.3	In this course, students will learn and identify steps in machine design process, various materials, their properties and their applications in human life as well as industrial practices.
107013.4	Students will understand concepts of various machining processes like casting, welding etc. and will be able to work in workshop on machining tools like lathe, drilling etc.
107013.5	Students will be able to impart knowledge of basic concepts in thermodynamics and heat transfer, different laws and
107013.6	Students will learn industrial applications of thermodynamics like power plants, refrigerators, automobile engines, pumps
Subject	Engineering Graphics II
Subject Code	102014
Course Outcome (COs)	
102014.1	Student will be able to demonstrate knowledge of 2D drafting software.
102014.2	Student will be able to understand,draw problems on projections of solids using autocad 2016.
102014.3	Student will be able to understand,draw problems on engineering curves using autocad 2016.
102014.4	Student will be able to understand,draw problems on development of solids using autocad 2016.
102014.5	Student will be able to understand,draw problems on orthographic projections using autocad 2016.
102014.6	Student will be able to understand,draw problems on isometric projections using autocad 2016.
second Year (SE) Mechanical Engineering (Curriculum 2015 Pattern)	
Semester-I	
Subject	Engg. Maths III
Subject Code	207002
Course Outcome (COs)	
207002.1	To apply different techniques to solve higher order ordinary differential equation and its application in engineering
207002.2	engineering streams.
207002.3	Analyze the different type of statistical methods and probability distribution and its application in engineering streams.
207002.4	Understand the fundamental concept of vector differentiation to solve various problems in science and engineering.
207002.5	Study the vector integral calculus and its and its application in various engineering streams
207002.6	Identify difference between ODE and PDE and application of partial differential equation in allied engineering streams.

Subject	Manufacturing Processes I
Subject Code	202041
Course Outcome (COs)	
202041.1	Understand and analyze foundry practices like pattern making, mold making, Core making and Inspection of defects.
202041.2	Understand and analyze Hot and Cold Working, Rolling, Forging, Extrusion and Drawing Processes.
202041.3	Understand different plastic molding processes, Extrusion of Plastic and Thermoforming.
202041.4	Understand different Welding and joining processes and its defects.
202041.5	Understand Design and Analyze different sheet metal working processes.
202041.6	Understand the constructional details and Working of Centre Lathe.
Subject	CAMD
Subject Code	202042
Course Outcome (COs)	
202042.1	Understand the importance of CAD in the light of allied technologies such as CAM, CAE, FEA, CFD, PLM.
202042.2	Understand the significance of parametric technology and its application in 2D sketching.
202042.3	Understand the significance of parametric feature-based modeling and its application in 3D machine components
202042.4	Ability to create 3D assemblies that represent static or dynamic Mechanical Systems.
202042.5	Ability to ensure manufacturability and proper assembly of components and assemblies.
202042.6	Ability to communicate between Design and Manufacturing using 2D drawings.
Subject	Thermodynamics
Subject Code	202043
Course Outcome (COs)	
202043.1	Identify various notations & to illustrate 1st & 2nd law of thermodynamics
202043.2	Calculate entropy, enthalpy, specific energy of thermodynamics system & find out the causes of irreversibility
202043.3	Apply 1st & 2nd law of thermodynamics to closed system, open system, power cycles, refrigeration cycles
202043.4	problems.
202043.5	Identify the types of boiler, its components & calculate the performance of boiler
202043.6	Analyse fuels & their combustion products

Subject	Material Science(MS)
Subject Code	202044
Course Outcome (COs)	
202044.1	Knowledge of basic concepts related to material and their applications.
202044.2	An ability to identify properties of material.
202044.3	An ability to identify and understand the structure of engineering materials.
202044.4	An ability to carry out self-learning in advanced topics related to material science.
202044.5	To develop futuristic insight into materials.
202044.6	An ability to conduct destructive and nondestructive test on unknown as well as known material.
Subject	Strength of Materials
Subject Code	202051
Course Outcome (COs)	
202051.1	Solve bar problems.
202051.2	Draw and interpretation of SFD and BMD.
202051.3	Identify, formulate, and solve beam problems
202051.4	Solve torsion problems.
202051.5	Identify, formulate, and solve complex problems
202051.6	Design a component to meet desired needs within realistic constraints of health and Safety
Subject	AUDIT COURSE
Subject Code	202055
Course Outcome (COs)	
202055.1	Understood human values, their significance and role in life.
202055.2	Promote self-reflection and critical inquiry that foster critical thinking of one's value and the values of others.
202055.3	Practice respect for human rights and democratic principles.
202055.4	Familiarized with various living and non-living organisms and their interaction with environment.
202055.5	Understood the basics regarding the leadership and to become a conscious professional.
semester II	
Subject	Fluid Mechanics
Subject Code	202045

Course Outcome (COs)	
202045.1	Use of various properties in solving the problems in fluids
202045.2	Use of Various types of manometer for measurement of pressure
202045.3	Use of Bernoulli's equation for solutions in fluids
202045.4	Determination of Velocity and shear Stress distribution for laminar flow in a pipe.
202045.5	Determination of Major and minor losses through metal and non metal pipes.
202045.6	Determination of forces drag and lift on immersed bodies
Subject	Soft Skills
Subject Code	202047
Course Outcome (COs)	
202047.1	Improved communication, interaction and presentation of ideas.
202047.2	Development of right-attitudinal and behavioral change
202047.3	Development of ability for Team Work
202047.4	Development of students overall personality
202047.5	Understanding and awareness about importance, role and contents of soft skills
202047.6	Students will be able to prepare CV's and Job Applications
Subject	Theory of Machine I
Subject Code	202048
Course Outcome (COs)	
202048.1	Identify mechanisms in real life applications.
202048.2	Perform kinematic analysis of simple mechanisms.
202048.3	Perform static and dynamic force analysis of slider crank mechanism.
202048.4	Determine moment of inertia of rigid bodies experimentally.
202048.5	Analyse velocity and acceleration of mechanisms by vector and graphical methods.
202048.6	To develop competency in drawing velocity and acceleration diagram for simple and complex mechanism.
Subject	Engineering Metallurgy
Subject Code	202049
Course Outcome (COs)	
202049.1	To Know Fundamentals of Metallography

202049.2	Selection and application of different Metals & Alloys
202049.3	To impart a fundamental knowledge of Ferrous & Non Ferrous Metal Processing
202049.4	To understand the process of corrosion and its preventions
202049.5	To develop futuristic insight into Metals
202049.6	To impart a fundamental knowledge of Ferrous & Non Ferrous Metal
Subject	Applied Thermodynamics
Subject Code	202050
Course Outcome (COs)	
202050.1	Explain IC engine & its various cycles
202050.2	State carburetion process , combustion phenomenon & detonation in SI engine
202050.3	Identify different types of injection systems and explain combustion phenomenon & knocking in CI engine
202050.4	Estimate various performance parameters of IC engine & state supercharging process
202050.5	Identify Various engine systems & state controlling methods of emission from IC engines & alternative fuels
202050.6	student will be able to understand, measure,calculate performance of reciprocating air compressor.
Subject	Electrical & Electronics Engineering
Subject Code	203152
Course Outcome (COs)	
203152.1	Understand the basics of 8051 microcontroller.
203152.2	Understand and use various timers/ counters modes of 8051 microcontroller
203152.3	Understand the basic of Electronic measuring instruments.
203152.4	Understand basics of electrical power measurement
203152.5	Understand the concept of DC Machines
203152.6	Understand concepts of Three Phase Induction motor
Subject	Machine Shop – I
Subject Code	202053
Course Outcome (COs)	
202053.1	To set the manufacturing set–up appropriately and study the corresponding set up parameters.
202053.2	To select appropriate process parameter for obtaining desired characteristic on work piece.
202053.3	To understand the operational problems and suggest remedial solution for adopted Manufacturing process.

202053.4	To understand the function of each tool and its used
202053.5	To understand the operation performed for making assembly.
202053.6	To understand the necessity of safety of human during manufacturing process.
third Year (TE) Mechanical Engineering (Curriculum 2015 Pattern)	
Semester-I	
Subject	Design of Machine Elements – I
Subject Code	302041
Course Outcome (COs)	
302041.1	Ability to analyze the stress and strain of mechanical components and understand, identify and quantify failure modes for mechanical Components such as shaft, Keys, Couplings and Other Machine Components.
302041.2	phenomena of fatigue in parts subjected to cyclic loads Failure analysis by using the Soderberg, Gerber and Goodman techniques.
302041.3	condition.
302041.4	Able to differentiate types of joints and Design bolted joints & Welded joints.
302041.5	Ability to select & design various type of spring for various application, also to aware the design of composite spring.
302041.6	Student shall gain design knowledge to choose proper material for different machine elements, also they may understand different types of failure modes and criteria, so that they may able to design any project with part drawing.
Subject	Heat Transfer
Subject Code	302042
Course Outcome (COs)	
302042.1	Formulate basic equations for heat transfer problems.
302042.2	Should be able to solve the problems of heat generation and transient conduction
302042.3	Apply concept of heat transfer for fins with different boundary conditions
302042.4	Apply the concept of natural and forced convection to simple systems
302042.5	Apply the concept of radiation to the simple systems
302042.6	Apply the concept of heat exchanger and condensation phenomenon
Subject	Theory of Machine – II
Subject Code	302043

Course Outcome (COs)	
302043.1	The students will able to understand the spur gear theory and ability to solve spur gear problems.
302043.2	theory.
302043.3	The students will able to understand the gear train theory and which will be prerequisite for gear design.
302043.4	The students will able to conversant with working principal of Step less regulation and Gyroscope.
302043.5	The students will able to conversant with working principal of control mechanism.
302043.6	The students will able to understand design of mechanism and cam profile.
Subject	Metrology and Quality Control
Subject Code	302045
Course Outcome (COs)	
302045.1	The students will learn various tools and techniques used to determine geometry and dimensions of the components.
302045.2	The students will learn to design gauges to meet desired needs within realistic constraints.
302045.3	The students will understand thread parameter, gear parameters and their measurements. Also students will be able to understand advancement in measurement system.
302045.4	The students will learn basics of quality and various quality tools.
302045.5	The students will learn to perform statistical experiments, as well as to analyze and interpret data.
302045.6	The students will understand basics of total quality management control tools.
Subject	turbo machines
Subject Code	202044
Course Outcome (COs)	
202044.1	Calculate force by using impulse momentum principle and able to analyze performance of pelton wheel.
202044.2	Construct velocity triangles for impulse turbine & able to design, analyze performance of reaction water turbines.
202044.3	Construct velocity triangles for impulse & reaction steam turbine & able to design, analyze performance.
202044.4	Construction, working & Analyze performance of centrifugal pump and its performance characteristics.
202044.5	Construction, working & Analyze performance of centrifugal compressors and its performance characteristics.
202044.6	Construction, working & Analyze performance of axial flow compressors and its performance characteristics.
Subject	Skill Development
Subject Code	302046

Course Outcome (COs)	
302046.1	To develop the skill for assemble and disassemble of machines.
302046.2	To have knowledge of the different tools and tackles used in machine assembly shop.
302046.3	Use of theoretical knowledge in practice.
302046.4	Practical aspect of the each component in the assembly of the machine.
302046.5	Demonstrate an understanding of group dynamics and effective teamwork
302046.6	others
semester II	
Subject	Numerical Methods & Optimization
Subject Code	302047
Course Outcome (COs)	
302047.1	Use appropriate Numerical Methods to solve complex mechanical engineering problem
302047.2	Effectively use Numerical Techniques for solving complex Mechanical engineering Problems.
302047.3	Generate Solutions for real life problem using optimization techniques.
302047.4	Analyze the research problem
302047.5	Prepare base for understanding engineering analysis software.
302047.6	Build the foundation for engineering research
Subject	
	Design of Machine Elements – II
Subject Code	302048
Course Outcome (COs)	
302048.1	Ability to design & selection of material for spur Gear
302048.2	Ability to design and select type of gears for different applications & their design
302048.3	Ability to design and select type of bearings from the manufacturers catalogue
302048.4	applications
302048.5	To study various types of drives like belt, rope & chain drive, their selection from manufacturers catalogue
302048.6	To identify & select the type of bearings for low speed applications of various engineering fields & its design
Subject	
	RAC
Subject Code	302049
Course Outcome (COs)	

302049.1	Illustrate the fundamental principles and applications of refrigeration and air conditioning system
302049.2	Obtain cooling capacity and coefficient of performance by conducting test on vapour compression refrigeration systems.
302049.3	Present the properties, applications and environmental issues of different refrigerants
302049.4	Calculate cooling load for air conditioning systems used for various applications
302049.5	Operate and analyze the refrigeration and air conditioning systems.
302049.6	select the components of refrigeration and air conditioning system
Subject	Mechatronics
Subject Code	302050
Course Outcome (COs)	
302050.1	Understand different types, classification and different sensors and actuators and applications
302050.2	Understand key elements of mechanical system their representation in block diagram. And their application s is household,automotive and industrial application
302050.3	Understand Interfacing of Sensors, Actuators using appropriate DAQ micro-controller
302050.4	Understand architecture , practical ladder logic programming and introduction to SCADA system
302050.5	To understand Time and Frequency domain analysis of system model (for control application
302050.6	To design control system using P,PI,PID controlsytem and transient response
Subject	Manufacturing Process – II
Subject Code	302051
Course Outcome (COs)	
302051.1	Student should be able to apply the knowledge of various manufacturing processes.
302051.2	Student should be able to identify various process parameters and their effect on processes.
302051.3	Student should be able to design and analyze various manufacturing processes and tooling.
302051.4	Student should be able figure out application of modernization in machining.
302051.5	Student should get the knowledge of Jig and Fixtures so as to utilize machine capability for variety of operations.
302051.6	Student should be able to make the arrangement of machineries according to product of any industry.
Subject	Machine Shop – II
Subject Code	302052
Course Outcome (COs)	

302052.1	To set the manufacturing set-up appropriately and study the corresponding set up parameters.
302052.2	To select appropriate process parameter for obtaining desired characteristic on work piece.
302052.3	To understand the operational problems and suggest remedial solution for adopted Manufacturing process.
302052.4	To understand the function of each tool and its used
302052.5	To understand the operation performed for making assembly.
302052.6	To understand the necessity of safety of human during manufacturing process.
Subject	Seminar
Subject Code	302053
Course Outcome (COs)	
302053.1	To promote and develop presentation skills and impart a knowledgeable society
302053.2	To Learn recent trends in mechanical engineering society
302053.3	To write effective reports & design documentation, make effective presentations, and give & receive clear instructions.
Subject	AUDIT COURSE
Subject Code	302054
Course Outcome (COs)	
302054.1	The students will be able to appreciate the concept of Entrepreneurship.
302054.2	The students will be able to identify entrepreneurship opportunity
302054.3	The students will be able to develop winning business plans
forth Year (BE) Mechanical Engineering (Curriculum 2012 Pattern)	
Semester-I	
Subject	Refrigeration & Air Conditioning
Subject Code	402041
Course Outcome (COs)	
402041.1	Illustrate the fundamental principles and applications of refrigeration and air conditioning system
402041.2	Obtain cooling capacity and coefficient of performance by conducting test on vapour compression refrigeration systems.
402041.3	Present the properties, applications and environmental issues of different refrigerants
402041.4	Calculate cooling load for air conditioning systems used for various applications
402041.5	Operate and analyze the refrigeration and air conditioning systems.

402041.6	select the components of refrigeration and air conditioning system
Subject	Dynamics of Machinery
Subject Code	402043
Course Outcome (COs)	
402043.1	Ability to understand solutions to balancing problems of machines
402043.2	Ability to understand the fundamentals of vibration and Noise.
402043.3	Ability to develop analytical competency in solving vibration problems.
402043.4	Ability to understand measurement and control of vibration and noise.
402043.5	Ability to calculate natural frequencies, Eigen values & Eigen vectors.
402043.6	problem.
Subject	Elective – I (Tribology)
Subject Code	402044 C
Course Outcome (COs)	
402044 C.1	Know about properties of lubricants, modes of lubrication, additives etc.
402044 C.2	surfaces.
402044 C.3	Understand the concept of Hydrodynamic lubrication and journal bearings.
402044 C.4	Understand the Hydrostatic lubrication and Squeeze film lubrication.
402044 C.5	Understand the concept of Elasto-hydrodynamic Lubrication and Gas Lubrication.
402044 C.6	Able to understand tribological applications in various fields
Subject	Elective – II (Operation Research)
Subject Code	402045 C
Course Outcome (COs)	
402045 C.1	Identify different types of OR models, Identify and select procedures for solving various OR models formulation of optimization models, solution methods in optimization, applications to a wide range of engineering problems
402045 C.2	problems
402045 C.3	games

402045 C.4	Illustrate the need to optimally utilize the resources in various types of industries.
402045 C.5	problems
402045 C.6	Demonstrate cost effective strategies in various applications in industry.
Subject	Elective – II (Advanced Manufacturing Process)
Subject Code	402045 D
Course Outcome (COs)	
402045 D.1	Student should able to explain different metal forming processes
402045 D.2	Student should able to explain advance welding, casting and forging process
402045 D.3	Student should able to explain advanced techniques for material science
402045 D.4	Student should able to explain micro machining
402045 D.5	Student should able to explain additive manufacturing process
402045 D.6	Student should able to explain measurement techniques in micro machining
Subject	Project – I
Subject Code	402046
Course Outcome (COs)	
402046.1	To embed the skill in group of students to work independently on a topic/ problem/ experimentation selected by them
402046.2	To encourage Students to think independently on their own to bring out the conclusion under the given circumstances of the curriculum period in the budget provided with the guidance of the faculty
402046.3	To encourage creative thinking process to help the Students to get confidence by planning and carrying out the work plan of the project and to successfully complete the same, through observations, discussions and decision making process.
Subject	CAD/CAM and automation
Subject Code	402045
Course Outcome (COs)	
402045.1	Analyze and Design Real World components
402045.2	To develop different types of surfaces with the help of different curves
402045.3	Suggest whether the given solid is safe for the load applied
402045.4	Select suitable manufacturing method for complex components
402045.5	Implement proper Rapid prototyping method for particular component

402045.6	Select the proper automation and robotic structure for particular system
Semester-II	
Subject	Power Plant Engineering
Subject Code	402047
Course Outcome (COs)	
402047.1	Know global scenario of power generation and economics of power generation
402047.2	Analyse performance of rankine cycle and condenser
402047.3	Select site for hydroelectric and nuclear power plant and construction working of hydraulic and nuclear power plant
402047.4	Find out the performance analysis of gas turbine power plant and diesel engine power plant
402047.5	conventional power plants
402047.6	Describe the working principal of power plant instruments and awareness about environmental impact due to power plants
Subject	
	Mechanical System Design
Subject Code	402048
Course Outcome (COs)	
402048.1	speed, kinematic & deviation diagram.
402048.2	To enable Students to learn basic principles & various terms used in material handling system & to design any conveyor required for transport of any type of material.
402048.3	Ability to apply statistical consideration in design to understand the importance of statistical tool in design & concept of aesthetic & ergonomic consideration in product design as well guidelines for design for manufacturing, assembly & safety.
402048.4	To able to classify the cylinders used in various engineering applications, design of unfired pressure vessel using standard code. Also to aware about various types of supports & end closures
402048.5	Student can able to apply basic design concept for designing of various I.C. engine components
402048.6	To able to learn the objectives of optimum design & their methods for optimization of various simple machine elements.
Subject	
	Elective – III (Industrial Engineering)
Subject Code	402049 C
Course Outcome (COs)	
402049 C.1	Students will be able to explain the basic concept of Industrial Engineering and different productivity techniques
402049 C.2	The Student will gain the knowledge of different work recording and various chart used for recording movement in shop

402049 C.3	The Student will gain the basic knowledge of work sampling, work measurement and different time study equipments.
402049 C.4	The student will gain the basic knowledge of advanced production planning and control techniques
402049 C.5	The student will gain the basic knowledge facility location with design and material handling equipments
402049 C.6	The Student will gain the knowledge of human resource
Subject	Elective – III (Robotics)
Subject Code	402049 C
Course Outcome (COs)	
402049 C.1	Understand the complete design procedure of the robot.
402049 C.2	Select correct mechanism for operation of the robot.
402049 C.3	Select necessary actuators, sensors, control for satisfactory performance of the robot.
402049 C.4	Select control system for accurate operation of the robot.
Subject	Elective – IV(FEA)
Subject Code	402050
Course Outcome (COs)	
402050.1	Understanding fundamental concepts of finite element methods and review of solid mechanism. Understanding of various approaches used to find displacement, strain and stress vectors.
402050.2	Derive element stiffness matrices and load vectors from various methods to solve for displacements and stresses for 1 D element using different approaches studied in first unit.
402050.3	Derive element stiffness matrices and load vectors from various methods to solve for displacements and stresses for 2 D elements using different approaches studied in first unit.
402050.4	Derive isoparametric formulation for 1D and 2D elements and perform numerical integration to analyses the problems.
402050.5	Analyze 1D heat-transfer problems and perform thermal analysis using commercial FEM and Interpret the results.
402050.6	Perform Dynamic analysis, Modal analysis
Subject	Project – II
Subject Code	402051
Course Outcome (COs)	
402051.1	To embed the skill in group of students to work independently on a topic/ problem/ experimentation selected by them
402051.2	To encourage Students to think independently on their own to bring out the conclusion under the given circumstances of the curriculum period in the budget provided with the guidance of the faculty

402051.3	To encourage creative thinking process to help the Students to get confidence by planning and carrying out the work plan of the project and to successfully complete the same, through observations, discussions and decision making process.
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**M. E. (Mechanical) (Design Engineering) 2017- Course
Semester-I**

Subject	Advanced Mathematics
Subject Code	507201
Course Outcome (COs)	
507201.1	Student Should be able to Study and apply the concepts of Inner Product Spaces & Orthogonality
507201.2	Student Should be able to Study and apply the concepts of 2. Complex Analysis such as Complex variables, Complex differentiation, Harmonic functions & calculus residue.
507201.3	special functions & its applications.
507201.4	Student Should be able to Study and apply Differential Equation.
507201.5	Student Should be able to Study and apply Numerical Analysis such as Finite difference analysis, Explicit and Implicit finite difference scheme, Wave equation, Laplace equation
507201.6	Student Should be able to Study and apply Calculus of Variation using different methods.
Subject	Material Science and Mechanical Behavior of Materials
Subject Code	502202
Course Outcome (COs):-Student Should be able to Study and apply	
502202.1	Modern Materials in Design Engineering
502202.2	Response of metals and alloys to applied load
502202.3	Material Testing under Complex Loading
502202.4	Plastic Behavior for strain-rate and temperature dependence of flow stress, deformation theory of plasticity
502202.5	Elastic-Plastic Equilibrium, residual stresses and strains, plastic-rigid body, elastic-plastic bending and torsion
502202.6	damping, natural decay
Subject	Advanced Stress Analysis
Subject Code	502203
Course Outcome (COs):-Student Should be able to Study and apply	
502203.1	Theory of Elasticity

502203.2	Theory of Torsion
502203.3	Stresses in Beams
502203.4	Contact stresses
502203.5	Experimental stress analysis
502203.6	Isoclinics and isochromatics
Subject	Research Methodology
Subject Code	502104
Course Outcome (COs)	
502104.1	Carry out Literature Survey
502104.2	Identify appropriate topics for research work in process instrumentation
502104.3	Select and define appropriate research problem and parameters
502104.4	Design the use of major experimental methods for research in process instrumentation
502104.5	Demonstrate own contribution to the body of knowledge
502104.6	Become aware of the ethics in research, academic integrity and plagiarism
Subject	Analysis and Synthesis of Mechanisms
Subject Code	502207
Course Outcome (COs)	
502207.1	Students should be able to apply concepts related to kinematic analysis of mechanisms & its analysis
502207.2	To understand Types of complex Mechanisms, velocity-acceleration analysis of complex mechanisms by the Normal Acceleration method and Auxiliary Point Method.
502207.3	To Understand & apply Curvature theory for different mechanisms.
502207.4	Understand Concept of Types of complex Mechanisms, velocity-acceleration analysis of complex mechanisms & its synthesis.
502207.5	Acquire knowledge of analytical synthesis of planer mechanisms.
502207.6	Use of different Kinematics of Spatial Mechanisms
Subject	Advanced Mechanical Vibrations
Subject Code	502208
Course Outcome (COs)	
502208.1	To understand Multi Degree Freedom System
502208.2	Student will be able to know , understand and solve various problems on Continuous System.

502208.3	Student will be able to know & apply concepts of Transient vibrations.
502208.4	Student will be able to know concept balancing techniques for vibration controls.
502208.5	Student will be able to understand & measure Vibrations using different instruments.
502208.6	To understand the concept of Random Vibrations.
Subject	Finite Element Method
Subject Code	502209
Course Outcome (COs)	
502209.1	Introduction to Finite element method.
502209.2	Able to solve One dimensional problems.
502209.3	Students should be able to convert Two Dimensional Isoperimetric Formulation
502209.4	Able to understand 3D Problems in stress analysis.
502209.5	Able to solve Plate Bending & Nonlinear Problems .
502209.6	To understand Dynamic Problems – Eigen value and Time Dependent Problems also algorithm approach for FEA
Subject	Optimization Techniques
Subject Code	602213
Course Outcome (COs) Student Should be able to Study and apply	
602213.1	Introduction to Mathematical Modeling
602213.2	Classical Optimization Techniques
602213.3	Linear Programming
602213.4	Non-Linear Programming
602213.5	Modern Methods of Optimization
602213.6	Modern Methods of Optimization problem formation.
Subject	Mechanical Measurements and Controls
Subject Code	602214
Course Outcome (COs) Student Should be able to Study and apply	
602214.1	Fundamentals of Measurements
602214.2	Fundamentals of interfacing of sensors with Microcontroller/computer
602214.3	Fundamentals of interfacing of sensors with Microcontroller/computer- Mathematical modeling of mechatronic system.

602214.4	Control using time domain
602214.5	Control using Frequency Domain