Viswambhara Educational Society

VAAGDEVI COLLEGE OF ENGINEERING
UGC-Autonomous
Department of Mechanical Engineering

COURSE OUTCOMES FOR B.TECH - ME R15 FOR THE YEAR 2015-2016

Course Outcome	Year/Semester I / I Sem	Subject Name (Subject Code) MATHEMATICS-I (A9001)	No. of Hours L:4 T:0 P:0	Credits: 4
After the completion of this course, the students should be able to				
1	By learning the first order differential equations student can able to find the solutions of many applications in engineering field.			
2	By studying the higher order differential equation many of the transcendental equations are solvable very easily.			
3	By studying the mean value theorems student can find roots of the algebraic and transcendental equations.			
4	By studying the applications of integration the student able to study find area, surface and volume of a revolution.			
5	The students understand how to find the solution of initial and boundary value problem without finding general solution by Laplace technique			
Course Outcome	Year/Semester I / I Sem	Subject Name (Subject Code) ENGLISH (A9012)	No. of Hours L:3 T:0 P:0	Credits: 3
After the completion of this course, the students should be able to				
1	Usage of correct English Language, written and spoken			
2	Enrichment of comprehension and fluency			
3	Gaining confidence in using language in varied situations			
Course Outcome	Year/Semester I / I Sem	Subject Name (Subject Code) ENGINEERING CHEMISTRY (A9011)	No. of Hours L:3 T:0 P:0	Credits: 3
After the completion of this course, the students should be able to				
1	Applications of electrochemistry understanding different types of cells, their representation, knowledge of electrode potentials, utilization of electrical energy and its conversation into different energies.			
2	Applicability of electrodes in different fields of analysis.			
3	Understanding the utility of batteries as a source of energy in many electronic gadgets & their types.			
4	Enhancement of power generation by making of fuel cells. Knowledge of need for alternate source of energy.			
5	Deterioration of metal under the influence of environment, Mechanism of corrosion, Factors affecting corrosion, Prevention of corrosion using various methods & A basic knowledge of surface coatings.			
6	Improving the properties of plastics by various additives, Integral role of various polymers in our life style & Applicability of plastic in automobile and textile industry.			

7	Knowledge of hardness of water and its effects, Industrial utility of water especially for steam generation, Removal Methodologies of hardness

Course Outcome	Year/Semester I / I Sem	Subject Name (Subject Code) ENGINEERING MECHANICS-I (A9301)	No. of Hours L:2 T:2 P:0	Credits: 3

After the completion of this course, the students should be able to

1	Apply engineering science principles to develop algebraic relationships among key physical parameters and variables based on analysis of a specified system
2	Apply the principles of mechanics for solving practical problems related to equilibrium of rigid bodies and particle in motion.
3	Use references that provide tabulated physical data that are useful for mechanical engineers.
4	Deal the subjects like Mechanics of Solids, Mechanics of Fluids and Design of machines etc. in higher classes with an ease

Course Outcome	Year/Semester I / I Sem	Subject Name (Subject Code) ENGINEERING GRAPHICS-I (A9304)	No. of Hours L:2 T:0 P:4	Credits: 4

After the completion of this course, the students should be able to

1	Understand the usage of various Engineering Drawing instruments.
2	Gain knowledge about conventions of drawings, dimensioning, scales and conic sections and applications of this knowledge is design of machine parts.
3	Understand the projections of plane surfaces and solids.
4	Understand the sections of solids and there usages in real time applications

Course Outcome	Year/Semester I / I Sem	Subject Name (Subject Code) COMPUTER PROGRAMMING (A9504)	No. of Hours L:3 T:0 P:0	Credits: 3

After the completion of this course, the students should be able to

1	A strong foundation in core Computer Science and Engineering, both theoretical and applied concepts.
2	An ability to apply knowledge of mathematics, science, and engineering to real-world problems.
3	Ability to model, understand, and develop complex software for System Software as well as Application Software.
4	A recognition of the need for, and an ability to engage in life-long learning

Course Outcome	Year/Semester I / I Sem	Subject Name (Subject Code) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB (A9013)	No. of Hours L:0 T:0 P:3	Credits: 2

After the completion of this course, the students should be able to

1	Better Understanding of nuances of language through audio- visual experience and group activities
2	Neutralization of accent for intelligibility
3	Speaking with clarity and confidence thereby enhancing employability skills of the students

Course Outcome	Year/Semester I / I Sem	Subject Name (Subject Code) COMPUTER PROGRAMMING LAB (A9505)	No. of Hours L:0 T:0 P:3	Credits: 2

	After the completion of this course, the students should be able to			
1	A strong foundation in core Computer Science and Engineering, both theoretical and applied concepts.			
2	An ability to apply knowledge of mathematics, science, and engineering to real-world problems.			
3	Ability to model, understand, and develop complex software for System Software as well as Application Software.			
4	A recognition of the need for, and an ability to engage in life-long learning.			
Course Outcome	**Year/Semester I / II Sem**	**Subject Name (Subject Code) MATHEMATICS-II (A9002)**	**No. of Hours L:3 T:1 P:0**	**Credits: 4**
	After the completion of this course, the students should be able to			
1	The student learns about the rank of the matrix and solving of system of simultaneous linear equations.			
2	The student learns about how to find the eigen values and eigen vectors of different engineering fields and they use concept of matrices in the development of programming languages.			
3	By studying the Fourier series & Fourier transforms students are able to solve the problem related to theory of circuits and many applications in electronics engineering and communication engineering.			
4	The concept of vector integrations (Green''s, Gauss & Stoke''s theorems), students are able to convert double integration into line integrations and triple integrations.			
5	By studying the partial differential equation students are able to solve the many applications of mechanical and civil Engineering.			
Course Outcome	**Year/Semester I / II Sem**	**Subject Name (Subject Code) ENGINEERING PHYSICS (A9009)**	**No. of Hours L:3 T:0 P:0**	**Credits: 3**
	After the completion of this course, the students should be able to			
1	The student learns about crystalline materials and their structures.			
2	The student learns about classification of solids by band theory.			
3	The student learns how to calculate number of charge carriers in a semi conductor.			
4	The student learns about fabrication of semi conductors into devices.			
5	The student learns about dielectrics and magnetic materials along with their engineering applications.			
6	The student learns about lasers, their construction and applications in engineering field.			
7	The student learns about super conductors, classifications and their applications.			
8	The student learns about nano materials and their fabrication methods along with their characterisation by XRD & SEM.			
Course Outcome	**Year/Semester I / II Sem**	**Subject Name (Subject Code) ENGINEERING MECHANICS-II (A9302)**	**No. of Hours L:3 T:1 P:0**	**Credits: 4**
	After the completion of this course, the students should be able to			
1	Apply engineering science principles to develop algebraic relationships among key physical parameters and variables based on analysis of a specified system			
2	Apply the principles of mechanics for solving practical problems related to equilibrium of rigid bodies and particle in motion.			

3	Use references that provide tabulated physical data that are useful for mechanical engineers.
4	Deal the subjects like Mechanics of Solids, Mechanics of Fluids and Design of machines etc. in higher classes with an ease.

Course Outcome	Year/Semester I / II Sem	Subject Name (Subject Code) ENGINEERING GRAPHICS-II (A9305)	No. of Hours L:2 T:0 P:4	Credits: 4

After the completion of this course, the students should be able to

1	Understand the development of surfaces.
2	Understand the intersection of solids and their applications.
3	Understand the isometric and orthographic projections and to understand the applications of these ideas in fabrication of machine parts.

Course Outcome	Year/Semester I / II Sem	Subject Name (Subject Code) OOP AND DATA STRUCTURES (A9508)	No. of Hours L:3 T:0 P:0	Credits: 3

After the completion of this course, the students should be able to

1	A strong foundation in core Computer Science and Engineering, both theoretical and applied concepts.
2	An ability to apply knowledge of mathematics, science, and engineering to real-world problems.
3	Ability to model, understand, and develop complex software for System Software as well as Application Software.
4	An ability to communicate effectively, both in writing and oral.
5	A recognition of the need for, and an ability to engage in life-long learning.

Course Outcome	Year/Semester I / II Sem	Subject Name (Subject Code) ENGINEERING WORKSHOP & IT WORK SHOP (A9307)	No. of Hours L:0 T:0 P:3	Credits: 2

After the completion of this course, the students should be able to

1	Know the fundamental knowledge of various trades and their usage in real time applications.
2	Gain knowledge of Foundry, Welding, Black smithy, Fitting, Machine shop and house wiring.
3	Understand the basis for analyzing power tools in construction and wood working, electrical engineering and mechanical engineering
4	Use basic concepts of computer hardware for assembly and disassembly

Course Outcome	Year/Semester I / II Sem	Subject Name (Subject Code) ENGINEERING PHYSICS LAB (A9010)	No. of Hours L:0 T:0 P:3	Credits: 2

After the completion of this course, the students should be able to

1	The laboratory course helps the student how to operate different equipments related to engineering. It also allows the student to develop experimental skills to design new experiments in engineering.
2	The course enlightens the student about modern equipment like solar cell, optical fibre etc.,
3	With the exposure to these experiments, the student can compare the theory and correlate with experiment.

Course Outcome	Year/Semester I / II Sem	Subject Name (Subject Code) OOP AND DATA STRUCTURES LAB (A9509)	No. of Hours L:0 T:0 P:3	Credits: 2
After the completion of this course, the students should be able to				
1	A strong foundation in core Computer Science and Engineering, both theoretical and applied concepts.			
2	An ability to apply knowledge of mathematics, science, and engineering to real-world problems.			
3	Ability to model, understand, and develop complex software for System Software as well as Application Software			
4	An ability to communicate effectively, both in writing and oral.			
5	A recognition of the need for, and an ability to engage in life-long learning			

COURSE OUTCOMES FOR B.TECH - ME R15 FOR THE YEAR 2015-2016

Course Outcome	Year/Semester II / I Sem	Subject Name (Subject Code) BASIC ELECTRICAL AND ELECTRONICS ENGINEERING (A9203)	No. of Hours L:3 T:0 P:0	Credits: 3
After the completion of this course, the students should be able to				
1	Get a thorough knowledge on basic electrical circuits, parameters, and operation of the transformers in the energy conversion process, electromechanical energy conversion			
2	Get a thorough knowledge on construction operation characteristics of DC machines and the constructional features and also fundamental and characteristics of diode and transistor			
3	Apply the above conceptual things to real-world electrical and electronics problems and applications			
Course Outcome	Year / semester II / I Sem	Subject Name (Subject Code) METALLURGY AND MATERIAL SCIENCE (A9308)	No. of Hours L:4 T:0 P:0	Credits:4
After the completion of this course, the students should be able to				
1	Understand the bond formation, grains and grain boundaries in cry metals			
2	Develop new materials using equilibrium diagram and lever rule applicable in calculating the liquid and solid percentage			
3	Apply heat treatment processes to different materials to get required properties			
4	Gain knowledge about advanced materials like composites & ceramics			
Course Outcome	Year / semester II / I Sem	Subject Name (Subject Code) MECHANICS OF SOLIDS(A9309)	No. of Hours L:4 T:0 P:0	Credits: 4
After the completion of this course, the students should be able to				
1	Understand the concepts of stress and strain in mechanics of solids and material properties			
2	Apply the fundamental concepts of shear force & bending moment for Cantilever Beam, simply supported beam & overhanging beam with point loads, UDL, gradually varying loads & their combination.			
3	Apply the fundamental concepts of Bending stresses & shear stresses for different Beams			
4	Apply the different methods to determine the deflection & slope of different beams like double integration method, Area moment method & Macaulay''s method.			
5	Apply the Lame''s equation to determine stresses in Thick cylinders			
Course Outcome	Year / semester II / I Sem	Subject Name (Subject Code) THERMODYNAMICS (A9310)	No. of Hours L:4 T:0 P:0	Credits: 4
After the completion of this course, the students should be able to				
1	Understand the basic thermodynamic principles and their applications			

2	Observe the thermodynamic principles in heating and air conditioning system, refrigerator and pressure cooker etc.,			
3	Analyze of automotive engines, rockets, jet engines and power plants.			
4	Analyze various thermodynamic cycles and refrigeration cycles.			

Course Outcome	Year / semester II / I Sem	Subject Name (Subject Code) MACHINE DRAWING (A9311)	No. of Hours L:2 T:0 P:4	Credits: 3

After the completion of this course, the students should be able to

1	Understand various conventions used in machine drawing
2	Prepare the assembly drawings from component drawing.
3	Understand the use of various machine components.
4	Interpret and make conclusions about a given drawing

Course Outcome	Year / semester II / I Sem	Subject Name (Subject Code) MECHANICS OF SOLIDS AND METALLURGY LAB (A9312)	No. of Hours L:0 T:0 P:3	Credits: 2

After the completion of this course, the students should be able to

1	Identify grain and grain boundary, crystal structure of different materials.
2	Study the microstructure of various materials.
3	Analyze the correlation between Mechanical and Metallurgical properties.
4	Perform material testing and analyze various material properties.

Course Outcome	Year / semester II / I Sem	Subject Name (Subject Code) FUELS AND LUBRICANTS LAB (A9313)	No. of Hours L:0 T:0 P:3	Credits: 2

After the completion of this course, the students should be able to

1	Apply different methods to determine the flash point & fire point of liquid fuels.
2	Apply carbon residue test to determine carbon% in liquid fuels.
3	Apply Different methods to determine viscosity of Liquid lubricants.
4	Apply different methods to determine the calorific value of fuels.

Course Outcome	Year / semester II / I Sem	Subject Name (Subject Code) BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB (A9204)	No. of Hours L:0 T:0 P:3	Credits: 2

After the completion of this course, the students should be able to

1	Easier solutions for the complex Electrical & Electronic Circuits.
2	Identify the optimum loading on the system.
3	Identify the performance of machines.
4	Identify the performance and operating nature of semi conductors.

Course Outcome	Year/Semester II / II Sem	Subject Name (Subject Code) GENDER SENSITIZATION (A9019) (MANDATORY ELECTIVE)	No. of Hours L:2 T:0 P:0	Credits: 0
After the completion of this course, the students should be able to				
1	Students will have developed a better understanding of important issues related to gender in contemporary India.			
2	Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.			
3	Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.			
4	Students will acquire insight into the gendered division of labor and its relation to politics and economics.			
5	Men and women students and professionals will be better equipped to work and live together as equals.			
6	Students will develop a sense of appreciation of women in all walks of life.			
7	Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence			
Course Outcome	Year / semester II / II Sem	Subject Name (Subject Code) PROBABILITY AND STATISTICS (A9005)	No. of Hours L:4 T:0 P:0	Credits:4
After the completion of this course, the students should be able to				
1	Describe randomness or an uncertainty in certain realistic situations it can be of either discrete or continuous functions and the study of binomial			
2	Describe the Poisson and normal random variables for the continuous case predominantly describe important probability distributions			
3	Important statistical properties for this random variables provide very good insight and essential for Industrial applications.			
4	By studying the queuing theory students are able to solve the real world problems of queuing systems			
Course Outcome	Year / semester II / II Sem	Subject Name (Subject Code) FLUID MECHANICS AND HYDRAULIC MACHINERY (A9314)	No. of Hours L:4 T:0 P:0	Credits: 4
After the completion of this course, the students should be able to				
1	Apply mathematics and basic sciences and translates this knowledge to understand fluid flow principles and their applications.			
2	Understand fundamental knowledge of the mechanics of fluid at rest and in motion.			
3	Observe and analyze fluid phenomena by developing and using the principles, laws for analyzing fluid interactions with natural and constructed systems.			
4	Understand fundamental knowledge & performance of different turbines & pumps.			
Course Outcome	Year / semester II / II Sem	Subject Name (Subject Code) THERMAL ENGINEERING – 1 (A9315)	No. of Hours L:4 T:0 P:0	Credits: 4

After the completion of this course, the students should be able to				
1	Work practically on IC engines to know about various components and can perform assemble and dissemble the parts.			
2	Draw port and valve timing diagrams of any engine. They can design piston dimensions and number of cylinders for any BHP requirement.			
3	Differentiate light vehicles, heavy vehicles and differentiate between petrol, diesel engines 4-stroke and 2-stroke engines.			
4	Analyze the conditions inside the cylinder when combustion takes place by providing sufficient instrumentation to the engines			
Course Outcome	**Year / semester II / II Sem**	**Subject Name (Subject Code)** KINEMATICS OF MACHINES (A9316)	**No. of Hours L:4 T:0 P:0**	**Credits: 4**

After the completion of this course, the students should be able to				
1	Identify the basic relations between distance, time, velocity and acceleration.			
2	Distinguish the basics of kinematics and kinetics of motion.			
3	Develop familiarity with application of kinematics theories to real-world machines.			
4	Understand analytical linkage analysis, determine cam profiles and understand gear trains			
Course Outcome	**Year / semester II / II Sem**	**Subject Name (Subject Code)** PRODUCTION TECHNOLOGY (A9317)	**No. of Hours L:4 T:0 P:0**	**Credits: 4**

After the completion of this course, the students should be able to				
1	Apply the knowledge of casting, welding joints and forces and power requirements in metal forming processes.			
2	Apply their knowledge in understanding the melting, solidification, pattern allowances, gating and riser design of mold cavity, aspects of casting.			
3	Understand basic calculations of forces and power requirements in the metal forming operations.			
4	Demonstrate application of welding using the arc welding, gas welding, resistance welding, soldering and brazing			
Course Outcome	**Year / semester II / II Sem**	**Subject Name (Subject Code)** FLUID MECHANICS AND HYDRAULIC MACHINERY LAB (A9318)	**No. of Hours L:0 T:0 P:3**	**Credits: 2**

After the completion of this course, the students should be able to				
1	Apply knowledge of fluid mechanics and hydraulic machines and translates this knowledge for understanding fluid flow principles and their application to experiments.			
2	Practical exposure by using components vacuum gauge, pressure gauge, manometers, pipes, motors, pumps & turbines.			
3	Use comparison of theoretical values with the real parameters.			
4	Know and understand the experimental analysis in turbines and pumps with parameters such as discharge, head of water, speed of brake drum			

Course Outcome	Year / semester II / II Sem	Subject Name (Subject Code) PRODUCTION TECHNOLOGY LAB (A9319)	No. of Hours L:0 T:0 P:3	Credits: 2
After the completion of this course, the students should be able to				
1	Understand basic knowledge and concepts of various experiments.			
2	Perform joining of materials (similar/dissimilar) using welding.			
3	Understand the concepts of extrusion and design of die.			
4	Operate injection molding and blow molding machines.			

Course Outcome	Year/Semester III/I Sem	Subject Name (Subject Code) MACHINE TOOLS (A9320)	No. of Hours L:3 T:0 P:0	Credits: 3
After the completion of this course, the students should be able to				
1	Apply cutting mechanics to metal machining based on cutting force and power consumption.			
2	Operate lathe, milling machines, drill press, grinding machines, etc.			
3	Evaluate mach inability of different materials using specific cutting forces and surface finish.			
4	Write CNC programs and conduct CNC machining.			
Course Outcome	Year / semester III/I Sem	Subject Name (Subject Code) DYNAMICS OF MACHINERY (A9321)	No. of Hours L:4 T:0 P:0	Credits:4
After the completion of this course, the students should be able to				
1	Evaluate the forces and torques in mechanisms and machines in operation. Know the function of governors, clutches and bearings, and do the problems on these.			
2	Evaluate the frictional torque in clutches and braking torque in brakes.			
3	Evaluate the dimensions of flywheels for different IC engines.			
4	Evaluate the balancing masses in rotary and reciprocating balancing.			
5	Evaluate the frequencies of different vibrations.			
Course Outcome	Year / semester III/I Sem	Subject Name (Subject Code) DESIGN OF MACHINE MEMBERS-1 (A9322)	No. of Hours L:4 T:0 P:0	Credits: 4
After the completion of this course, the students should be able to				
1	Design a particular machine element and make use of standards parts and dimensions using design data book.			
2	Design of shafts , shaft couplings like flange couplings, flexible couplings.			
3	Determine the Stresses and deflections of helical springs, bolded joints, keys, cotters, knuckle joints.			
4	Design of riveted, welded joint and screwed joints.			
Course Outcome	Year / semester III/I Sem	Subject Name (Subject Code) METROLOGY AND SURFACE ENGINEERING (A9323)	No. of Hours L:3 T:1 P:0	Credits: 3
After the completion of this course, the students should be able to				
1	Apply mathematics to calculations of surface texture assessment by using C.L.A. and R.M.S. methods and linear, angular measurement by using various micrometers, bevel			

		protractor, auto collimator etc.		
2		Understand and apply principles of optics, interference, light to optical flats, interferometers, microscopes and optical measuring instruments.		
3		Use references that provide tabulated physical data that are useful to assembly of components, clearance, transition, interference fits.		
4		Understand the basic techniques of surface engineering, surface treatment, surface coatings, and surface cleanings		

Course Outcome	Year / semester III/I Sem	Subject Name (Subject Code) THERMAL ENGINEERING - II (A9324)	No. of Hours L:3 T:1 P:0	Credits: 3
After the completion of this course, the students should be able to				
1		This course provides the basis for subsequent courses involving the analysis, design and/or operation of engineered systems: power plants, jet propulsive systems, rockets.		
2		The student will demonstrate an ability to enumerate the differentiating features between a water tube and fire tube boilers.		
3		The student will demonstrate an ability to draw the heat balance sheet of a boiler.		
4		The student will demonstrate ability to show by graphical method, variation in the pressure and velocity of steam in an impulse turbine.		

Course Outcome	Year / semester III/I Sem	Subject Name (Subject Code) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS (A9601) (OPEN ELECTIVE -1)	No. of Hours L:3 T:0 P:0	Credits:3
After the completion of this course, the students should be able to				
1		To study fundamental concepts in managerial economics and financial analysis including certain basic issues governing the business operations.		
2		To learn the concepts of demand, elasticity of demand and demand forecasting and methods of demand forecasting		
3		To learn various issues involved in production decision analysis.		
4		To gain the knowledge of Break – Even Analysis and its importance in managerial decision making		
5		To learn different types of market environment under various types of competition.		
6		To gain the knowledge of new economic environment in post – liberalization scenario.		
7		To know the concepts of capital budgeting and various methods of capital budgeting and its application in business decision making.		

Course Outcome	Year / semester III/I Sem	Subject Name (Subject Code) PRINCIPLES OF ENTREPRENEURSHIP (A9603) (OPEN ELECTIVE -1)	No. of Hours L:3 T:0 P:0	Credits: 3
After the completion of this course, the students should be able to				
1		The objective of the course is to make students understand the nature of entrepreneurship, and to motivate the student to start his/her own enterprise.		
2		The objective of the course is to enlighten with the fragrance of Corporate Good Governance and Business Ethics, so that they would become the best entrepreneurs / managers of the corporate		

		world.		
3		The students should be able to understand the mindset of the entrepreneurs, identity ventures for launching, develop an idea on the legal framework and also understand strategic perspectives in entrepreneurship.		
Course Outcome	**Year /Semester III / ISem**	**Subject Name (Subject Code)** INTELLECTUAL PROPERTY RIGHTS (A9626) (OPEN ELECTIVE -1)	**No. of Hours L:3 T:0 P:0**	**Credits:3**

After completion of this course, the student shall be/shall

1	An ability to apply knowledge of mathematics, science and engineering to real world problem
2	Ability to model, understand and develop complex software for system software as well as application software
3	The broad education necessary to understand the impact of computer science and engineering solutions in the scientific, societal and human contexts
4	A recognition of the need for, and an ability to engage in life-long learning

Course Outcome	**Year/Semester III/I Sem**	**Subject Name (Subject Code)** THERMAL ENGINEERING LABORATORY (A9325)	**No. of Hours L:0 T:0 P:3**	**Credits: 2**

After the completion of this course, the students should be able to

1	Student is able to identify various types of engines and their parts
2	Student can understand the power of different engine and where they can be used
3	Student is able to estimate the performance of different engine and analyze them
4	Student is able to run the engines to set better efficiencies by knowing Brake specific fuel consumption of the engines.

Course Outcome	**Year / semester III/I Sem**	**Subject Name (Subject Code)** METROLOGY AND MACHINE TOOLS LABORATORY (A9326)	**No. of Hours L:0 T:0 P:3**	**Credits: 2**

After the completion of this course, the students should be able to

1	Use different types of measuring instruments
2	Perform different operations on Lathe machines.
3	Measure angles and taper measurements.
4	This course provides fundamental knowledge and principles of machining to the operation of different marching processes on machine tools.
5	The course draws upon knowledge of metal cutting principles turnouts the lathes, milling, drilling, shaping, slotting, and grinding machines.
6	The course shows how to evaluate machined work piece surface finish and dimensional accuracy using metrology equipment.
7	Students will be able to differentiate the lubrication and cooling effects of various cutting fluids.

Course Outcome	**Year / semester III/II Sem**	**Subject Name (Subject Code)** FINITE ELEMENT METHODS (A9327)	**No. of Hours L:4 T:0 P:0**	**Credits: 4**

After the completion of this course, the students should be able to

1	Student is able to analyze real time engineering objects and to present a well designed structures.
2	Student can analyze bars beams, shafts and array symmetric solids.
3	Student is able to understand and analyze the heat flow and know the temperature distribution at various points on the components.
4	Student can analyze any complicated structure by utilizing the computer software like ANSYS instead of analytical methods.

Course Outcome	Year / semester III/II Sem	Subject Name (Subject Code) DESIGN OF MACHINE MEMBERS - II (A9328)	No. of Hours L:4 T:0 P:0	Credits: 4

After the completion of this course, the students should be able to

1	Design a particular machine element and make use of standards parts and dimensions using design data book.
2	Design journal and roller bearings, engine parts like connecting rod, crank pins, crank shafts, pistons, cylinder and cylinder liner.
3	Design curved beams on T sections, crane hook.
4	Determine Power transmission system.

Course Outcome	Year / semester III/II Sem	Subject Name (Subject Code) HEAT TRANSFER (A9329)	No. of Hours L:3 T:1 P:0	Credits: 3

After the completion of this course, the students should be able to

1	Design the components like heat exchangers, boilers, condensers, fins etc as per the requirement
2	Understand the working of the physical components involving steady, unsteady states like refrigeration, electric iron.
3	Design the fins for an electronic component by knowing its heat generation.
4	Design Heat exchangers based on different modes of heat transfer.

Course Outcome	Year / semester III/II Sem	Subject Name (Subject Code) ENVIRONMENTAL STUDIES (A9014)	No. of Hours L:3 T:0 P:0	Credits: 3

After the completion of this course, the students should be able to

1	Understanding of Ecosystem
2	Natural resources, Depletion of natural resources & prevention of natural resources
3	Biodiversity, Protection, sharing of the biodiversity.
4	Environmental pollution, Understanding of water, soil, noise, air pollutions and their control measurements following the rules of environmental policy, legislation. Working towards the sustainable future.

Course Outcome	Year / semester III/II Sem	Subject Name (Subject Code) NANO TECHNOLOGY (A9330) (OPEN ELECTIVE -2)	No. of Hours L:3 T:0 P:0	Credits:3

After the completion of this course, the students should be able to

1	Understand the fundamentals of Nanotechnology

2	Know the different classes of nano materials			
3	Impart basic knowledge on various synthesis and characterization techniques involved in Nanotechnology			
4	Make the learner familiarize with nanotechnology potentialities			

Course Outcome	Year / semester III/II Sem	Subject Name (Subject Code) DATABASE MANAGEMENT SYSTEMS (A9501) (OPEN ELECTIVE - 2)	No. of Hours L:3 T:0 P:0	Credits: 3
After the completion of this course, the students should be able to				
1	A strong foundation in core Computer Science and Engineering, both theoretical applied concepts			
2	Ability to model, understands, and develop complex software for system software as well as application software			
3	The broad education necessary to understand the impact of Computer Science and Engineering solutions in the scientific, societal and human contexts			
4	A Knowledge of Contemporary Issues.			

Course Outcome	Year /Semester III / II Sem	Subject Name (Subject Code) DISASTER MANAGEMENT (A9127)	No. of Hours L:3 T:0 P:0	Credits:3
After completion of this course, the student shall be/shall				
1	Understand the difference between a hazard and disaster			
2	Know about various disasters and their impacts			
3	Understand different approaches of disaster risk reduction			
4	Understand disaster risks in India			

Course Outcome	Year/Semester III/II Sem	Subject Name (Subject Code) AUTOMOBILE ENGINEERING (A9331)	No. of Hours L:3 T:0 P:0	Credits: 3
After the completion of this course, the students should be able to				
1	Understand working of engine based upon the principles of 2- stroke, and 4-stroke			
2	Analyze the cooling systems depending upon the cooling requirements for particular automobile.			
3	Understand different types of ignition systems used in case of an automobile			
4	Understand various transmission systems, steering systems and suspension and breaking systems			
5	Understand different types of fuel injection system and pump system			
6	Understand the pollution controlling system and their standards			

Course Outcome	Year / semester III/II Sem	Subject Name (Subject Code) ARTIFICIAL NEURAL NETWROKS (A9535) (PROFESSIONAL ELECTIVE - 1)	No. of Hours L:3 T:0 P:0	Credits:3
After the completion of this course, the students should be able to				
1	Artificial and Biological Neural Networks			
2	Architecture of different algorithms Neural controller for a temperature process			
3	Fuzzy logic principles			

4	Membership principles and functions			
Course Outcome	**Year / semester III/II Sem**	**Subject Name (Subject Code)** MECHATRONICS (A9332)	**No. of Hours** **L:3 T:0 P:0**	**Credits: 3**

After the completion of this course, the students should be able to

1	Use the control system; mechatronics design systems and measurement systems.
2	Work on various actuating systems.
3	Convert the signals from one from to another form.
4	Estimate the micro controllers and micro processors.

Course Outcome	**Year / semester III/II Sem**	**Subject Name (Subject Code)** MECHANICS OF COMPOSITE MATERIALS(A9333) (PROFESSIONAL ELECTIVE - 2)	**No. of Hours** **L:3 T:0 P:0**	**Credits: 3**

After the completion of this course, the students should be able to

1	Highlight the appropriate use of composite materials in the industry
2	Understand the significance of replacing existing metal structures with composite materials whenever beneficial
3	Comprehend the complexity of design of composite materials and structures
4	Apply of knowledge of mechanics of composite materials for analyzing advanced materials involved in current trends and research area
5	Apply the knowledge of composite materials for designing structures for aerospace applications and smart structures

Course Outcome	**Year / semester III/II Sem**	**Subject Name (Subject Code)** **REFRIGERATION AND AIR CONDITIONING** (A9334) (PROFESSIONAL ELECTIVE - 2)	**No. of Hours** **L:3 T:0 P:0**	**Credits: 3**

After the completion of this course, the students should be able to

1	Understand all the basic principles of refrigeration
2	Prepare a model refrigeration system, using various components according to the requirement
3	Design an A.C. unit for by calculating the heat loads
4	Observe and analyze large capacity units like ice plants, cold storages and central A.C. units

Course Outcome	**Year / semester III/II Sem**	**Subject Name (Subject Code)** MAINTENANCE AND SAFETY ENGINEERING (A9335) (PROFESSIONAL ELECTIVE - 2)	**No. of Hours** **L:3 T:0 P:0**	**Credits:3**

After the completion of this course, the students should be able to

1	The maintenance in equipment life cycle.
2	The preventive and corrective measures in maintenance.
3	The inventory control in maintenance.

4	The in costing and budget preparation
5	Take the reliability measures, reliability networks and reliability analysis techniques.

Course Outcome	Year / semester III/II Sem	Subject Name (Subject Code) HEAT TRANSFER LABORATORY (A9336)	No. of Hours L:0 T:0 P:3	Credits:2

After the completion of this course, the students should be able to

1	Student is able to analyze and conduct the experiments to know the heat transfer and temperatures
2	Student is able to interpret the experimental knowledge in the real life situation like in, electric iron, and refrigerator
3	Student is able to possess the application knowledge of engine radiation, air condition chambers, solar collectors, engine radiators etc
4	Student can design a heat transfer system to cool the given component to required temperature within the desired time

Course Outcome	Year / semester III/II Sem	Subject Name (Subject Code) ADVANCED ENGLISH COMMUNICATION SKILLS LAB (A9021)	No. of Hours L:0 T:0 P:3	Credits: 2

After the completion of this course, the students should be able to

1	Developing sound vocabulary and its proper use contextually
2	Inculcating flair for Writing and felicity in written expression
3	Enhancing job prospects
4	Acquiring effective speaking abilities

Course Outcome	Year /Semester IV / ISem	Subject Name (Subject Code) INDUSTRIAL MANAGEMENT (A9337)	No. of Hours L:3 T:1 P:0	Credits:3

After completion of this course, the student shall be/shall

1	Plan an organizational structure for a given context in the organisation carry out production operations through Work study.
2	Carry out production operations through Work study.
3	Understand the markets, customers and competition better and price the given products appropriately.
4	Ensure quality for a given product or service.
5	Plan and control the HR function better.
6	Plan, schedule and control projects through PERT and CPM.
7	Evolve a strategy for a business or service organization.

Course Outcome	Year/Semester IV /I Sem	Subject Name (Subject Code) CAD/CAM(A9338)	No. of Hours L:3 T:1 P:0	Credits: 3

After the completion of this course, the students should be able to

1	Observe the various input and output devices used in CAD/CAM systems
2	Understand 2D and 3D transformations problems can be assigned to students.
3	Write the programs for different models by using NC part programming.
4	Analyze the Group Technology (GT), CAQC (Computer Aided Quality Control) and

		CIM (Computer Integrated Manufacturing) systems.		
Course Outcome	**Year / semester IV/I Sem**	**Subject Name (Subject Code)** INSTRUMENTATION AND CONTROL SYSTEMS (A9339)	**No. of Hours L:3 T:1 P:0**	**Credits: 3**

After the completion of this course, the students should be able to

1	Gain knowledge on various parts of machine and IC engine. Understand the design construction of machine parts.
2	To gain knowledge of functioning of parts such as connecting rod, eccentric etc.
3	To understand how heat and electricity are combined in calibrating thermoelectric devices, especially resistance temperature detector, thermo couple.
4	To measure the displacement using LVDT transducer. To gain knowledge on flow measurement using rotometer.

Course Outcome	**Year / semester IV / I Sem**	**Subject Name (Subject Code)** UNCONVENTIONAL MACHINING PROCESSES (A9340) (PROFESSIONAL ELECTIVE - 3)	**No. of Hours L:3 T:0 P:0**	**Credits: 3**

After the completion of this course, the students should be able to

1	Understand selection of processes.
2	Design the components of Abrasive Jet machining process.
3	Observe surface properties after machining without destructing the material.
4	Select the material with respect to process.

Course Outcome	**Year / semester IV / I Sem**	**Subject Name (Subject Code)** POWER PLANT ENGINEERING (A9328) (PROFESSIONAL ELECTIVE - 3)	**No. of Hours L:3 T:0 P:0**	**Credits: 3**

After the completion of this course, the students should be able to

1	Understand the layout of power generation units for different energy sectors.
2	An ability to identify different subsystem and systems of power generation sector.
3	Broad Exposure to existing and emerging alternative energy sources
4	Exploring the opportunities in contributing towards the solving of energy crisis.

Course Outcome	**Year / semester IV / I Sem**	**Subject Name (Subject Code)** DESIGN FOR MANUFACTURING (A9342) (PROFESSIONAL ELECTIVE - 3)	**No. of Hours L:3 T:0 P:0**	**Credits: 3**

After the completion of this course, the students should be able to

1	To understand various general design rules for manufacturing and criteria for material selection
2	To study various machining processes and tolerance aspects in machining
3	To know the design considerations for casting and welding processes
4	To understand the conceptual design factors to be considered in forging extrusion and sheet metal work
5	To study the general design guidelines for manual assembly and development of DFA Methodology

Course Outcome	Year / semester IV / I Sem	Subject Name (Subject Code) ROBOTICS (A9343) (PROFESSIONAL ELECTIVE - 4)	No. of Hours L:3 T:0 P:0	Credits: 3
After the completion of this course, the students should be able to				
1	Apply the knowledge of robotics in real time human life applications			
2	Implement the concept of CAD/CAM and automation to the robotics			
3	Gain knowledge of robot applications in manufacturing like, material handling, loading and unloading etc			
4	Apply the robotics to the spot and continuous arc welding and spray painting.			

Course Outcome	Year / semester IV / I Sem	Subject Name (Subject Code) COMPUTATIONAL FLUID DYNAMICS (A9344) (PROFESSIONAL ELECTIVE - 4)	No. of Hours L:3 T:0 P:0	Credits:3
After the completion of this course, the students should be able to				
1	Describe Governing equations of CFD.			
2	Analyze problems with Euler and Navier Stokes Eqns.			
3	Evaluate CFD codes.			
4	Analyze different models with different algorithms.			

Course Outcome	Year / semester IV / I Sem	Subject Name (Subject Code) GAS DYNAMICS (A9345) (PROFESSIONAL ELECTIVE - 4)	No. of Hours L:3 T:0 P:0	Credits: 3
After the completion of this course, the students should be able to				
1	Gain Knowledge on various concepts of flows.			
2	To gain knowledge on the one, two and Quasi – one dimensional flows.			
3	To gain knowledge on the wave motions.			
4	To gain knowledge on the Different types of Tunnels			

Course Outcome	Year /Semester IV / I Sem	Subject Name (Subject Code) NON CONVENTIONAL ENERGY SOURCES (A9346) (PROFESSIONAL ELECTIVE - 5)	No. of Hours L:3 T:0 P:0	Credits:3
After completion of this course, the student shall be/shall				
1	Apply the technology to capture the energy from the renewable sources like sun, Wind, ocean, biomass, geothermal.			
2	Use different renewable energy sources to produce electrical power minimize the use of conventional energy sources to produce electrical energy			
3	Identify the fact that the conventional energy resources are depleted			

Course Outcome	Year/Semester IV / I Sem	Subject Name (Subject Code) MECHANICAL VIBRATIONS (A9347) (PROFESSIONAL ELECTIVE - 5)	No. of Hours L:3 T:0 P:0	Credits: 3
After the completion of this course, the students should be able to				

1	Format mathematical modes of problems in vibrations
2	To obtain the complete solution for the motion of vibrators system (damped & undamped subjected to non periodic forcing functions)
3	To obtain design parameters and indicate methods of solutions for complicatory vibratory problems.

Course Outcome	Year / semester IV / I Sem	Subject Name (Subject Code) AUTOMATION IN MANUFACTURING (A9348) (PROFESSIONAL ELECTIVE - 5)	No. of Hours L:3 T:0 P:0	Credits:3

After the completion of this course, the students should be able to

1	Get complete idea about necessity of automating any industry and procedure to be adopted for automation.
2	Learn about different types of automated flow lines, transfer lines.
3	Get command over all types of material handling systems and adaptive control systems.
4	Conceptualize about the packages available for advanced techniques available in mechanical engineering.

Course Outcome	Year / semester IV / I Sem	Subject Name (Subject Code) CAD/CAM LABORATORY (A9349)	No. of Hours L:0 T:0 P:3	Credits: 2

After the completion of this course, the students should be able to

1	Draw the part drawings which are utilized in real time applications
2	Understand the different types of stress analysis, load calculations by using ANSYS software.
3	Analyze 2D and 3D part drawings using AutoCAD, Pro-E software packages
4	Develop and understand the NC part program generation by using CADEM packages

Course Outcome	Year / semester IV /I Sem	Subject Name (Subject Code) PRODUCTION DRAWING PRACTICE& INSTRUMENTATION AND CONTROL SYSTEMS LAB (A9350)	No. of Hours L:0 T:0 P:3	Credits: 2

After the completion of this course, the students should be able to

1	Draw the part drawings which are utilized in real time applications
2	Understand the different types of Limits, Fits and Tolerances
3	Analyze stresses of 2D and 3D truss and deflection of beams using software packages
4	Apply CFD analysis of simple fluid flow systems involving heat transfer, using CFD simulation software
5	Understand the stress analysis of different types of beams.
6	To understand the thermal analysis of heat transfer systems
7	To gain the knowledge of CFD analysis of simple fluid flow systems.

Course Outcome	Year / semester IV / II Sem	Subject Name (Subject Code) PRODUCTION PLANNING AND CONTROL (A9352) (OPEN ELECTIVE - 3)	No. of Hours L:3 T:1 P:0	Credits: 3

After the completion of this course, the students should be able to				
1	Design and plan an economical production system.			
2	Learn about effective utilization of plant resources			
3	Provide alternate production strategies			
4	Guide shop floor people for manufacturing products of required quantity and required quality in right time.			
Course Outcome	**Year / semester** **IV / II Sem**	**Subject Name (Subject Code)** RELIABILITY ENGINEERING (A9353) **(OPEN ELECTIVE - 3)**	**No. of Hours** **L:3 T:1 P:0**	**Credits: 3**

After the completion of this course, the students should be able to				
1	Understand and analyze different methods of failure			
2	Calculate MTTF, MTBF, failure rate and hazard rate			
3	Different probability methods applied to Reliability			
4	Optimize Cost & reliability			
5	Perform FEMA, FMECA, DOE, Taguchi method.			
6	Different methods to test reliability			
Course Outcome	**Year / semester** **IV / II Sem**	**Subject Name (Subject Code)** OPERATIONS RESEARCH (A9006) (OPEN ELECTIVE -3)	**No. of Hours** **L:3 T:1 P:0**	**Credits:3**

After the completion of this course, the students should be able to				
1	Find out the optimization solutions through graphical procedures			
2	Important statistical concepts like transportation, assignment, sequencing and game theory strategies			
3	Develop very good insight and essential real world problems solutions and its applications for the student community			
Course Outcome	**Year / semester** **IV / II Sem**	**Subject Name (Subject Code)** **CNC TECHNOLOGIES** (A9354) (PROFESSIONAL ELECTIVE - 6)	**No. of Hours** **L:3 T:1 P:0**	**Credits: 3**

After the completion of this course, the students should be able to				
1	Understand the basic procedures and concepts of programming, set up and operation of a CNC Machining Center			
2	Identify and understand the basic programming codes			
3	Create geometry and tool paths from the specifications on a blueprint for simple parts using Master cam programming software			
4	Identify and define the functions of the CNC machine control.			
5	Set up the CNC machining center for manufacturing simple parts			
6	Manufacture simple parts on the CNC machining center			
Course Outcome	**Year /Semester** **IV / II Sem**	**Subject Name (Subject Code)** PLANT LAYOUT AND MATERIAL HANDLING **(A9355)** (PROFESSIONAL ELECTIVE - 6)	**No. of Hours** **L:3 T:1 P:0**	**Credits:3**

After completion of this course, the student shall be/shall	
1	Get the knowledge of various types of material handling systems.
2	Understand merits, demerits and applications of different types of plant layouts.
3	Get the knowledge of applications of ergonomics in material handling
4	Get the knowledge of designing of cost effective material handling systems

Course Outcome	Year/Semester IV / II Sem	Subject Name (Subject Code) JET PROPULSION AND ROCKET ENGINEERING (A9356) (PROFESSIONAL ELECTIVE - 6)	No. of Hours L:3 T:1 P:0	Credits: 3

After the completion of this course, the students should be able to	
1	Present aerospace propulsive devices as systems
2	Functional requirements and engineering and environmental limitations
3	Mission analysis, fundamental performance relations & exemplary design solutions are presented.