2016-2017

MECHANICAL ENGINEERING

2016-2017

Odd semester

COURSE OBJECTIVES AND COURSE OUTCOMES FOR S7

MECHANICAL

13.701: PRINCIPLES OF MANAGEMENT AND DECISION MODELING COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Examination of management theory and provide opportunities for application of these ideas in real world situations.	Evaluate the global context for taking managerial actions of planning, organizing and controlling.
2	This examination focuses on the managerial functions of Assessing, Planning, Organizing, and Controlling.	Assess global situation, including opportunities and threats that will impact management of an organization.
	Both traditional and cutting-edge approaches are introduced and applied.	Integrate management principles into management practices.
4	Specific attention is paid throughout the course to the ethical implications of managerial action and inaction.	Assess managerial practices and choices relative to ethical principles and standards. Specify how the managerial tasks of planning, organizing, and controlling can be

		executed in a variety of circumstances.
5		**Determine the most effective action to take in specific situations.**
6		**Evaluate approaches to addressing issues of diversity.**

13.702: MECHATRONICS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Have a strong foundation in science and focus in mechanical, electronics, control, software, and computer engineering, and a solid command of the newest technologies.	Employ the knowledge of mathematics, science, and engineering.
2	Be able to design, analyze, and test "intelligent" products and processes that incorporate appropriate computing tools, sensors, and actuators.	Design and conduct experiments to evaluate the performance of a mechatronics system or component with respect to specifications, as well as to analyze and interpret data.
3	Be able to demonstrate professional interaction and communicate effectively with team members.	Design mechatronics component, system or process to meet desired needs.
4	Be able to work efficiently in multidisciplinary teams.	Define and solve engineering problems.
5	Be prepared for a variety of engineering careers, graduate studies, and continuing	Use the techniques, skills, and modern mechatronics engineering tools necessary for engineering practice.

	education	
6	**Practice professional and ethical responsibility, and, be aware of the impact of their designs on human-kind and the environment.**	**Function effectively as members of multidisciplinary teams.**

13.703: GAS DYNAMICS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To familiarize with behavior of compressible gas flow	To distinguish between various flow regimes
2	To understand the difference between subsonic and supersonic flow	To analyse the flow under different flow conditions
3	To familiarize with high speed test facilities	To assess the flow behavior and consequent loads due to flow
4	To understand the basic difference between incompressible and compressible flow.	To get the knowledge about the main properties which are used for analyzing or modeling of compressible flow.
5	Topics to be covered include conservation laws, propagation of disturbances, isentropic flow, compressible flow in ducts with area changes, normal and oblique shock waves and applications, Prandtl-Meyer flow and applications, simple flows such as Fanno flow and	Formulate and solve problems in one - dimensional steady compressible flow including: isentropic nozzle flow, constant area flow with friction (Fanno flow) and constant area flow with heat transfer (Rayliegh flow).

	Rayleigh flow with applications to nozzles, and propulsion related concepts.	
6	**The method of characteristics will be described in one dimensional unsteady isentropic flow.**	**• Derive the conditions for the change in pressure, density and temperature for flow through a normal shock.**
7	**The emphasis will be on the physical understanding of the phenomena and basic analytical results.**	**• Determine the strength of oblique shock waves on wedge shaped bodies and concave corners.**
		• Determine the change in flow conditions through a Prandtl-Meyer expansion wave.
		• Complete a numerical analysis to solve an unsteady one-dimensional flow problem.

13.704: REFRIGERATION & AIR-CONDITIONING COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Students will learn the basic concepts and principles of air conditioning and refrigeration.	Students will demonstrate an ability to analysis psychrometric processes and cycles of air conditioning systems.
2	Students will learn the fundamental analysis methodology of air conditioning and refrigeration.	Students will demonstrate an ability to estimate the energy requirements of cooling and heat equipment for simple air conditioning applications.
3	Students will learn the basic process and systems of air conditioning and refrigeration.	Students will demonstrate an ability to analysis and heat loads, particularly from solar radiation.
4	Students will apply the course knowledge to do a design project of HVAC system.	Students will demonstrate an ability to estimate energy requirements for simple air conditioning processes.
5		Students will demonstrate an ability to apply principles of air conditioning to perform energy analysis of simple air conditioning applications.
6		Students will show an ability to apply the

		HVAC theory to design a HVAC system.

13.705: DESIGN OF MACHINE ELEMENTS II COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Develop an ability to apply knowledge of mathematics, science, and engineering Outcomes	Be able to analyze the stress and strain on mechanical components; and understand, identify and quantify failure modes for mechanical parts
2	To develop an ability to design a system, component, or process to meet desired needs within realistic constraints.	Demonstrate knowledge on basic machine elements used in machine design; design machine elements to withstand the loads and deformations for a given application, while considering additional specifications.
3	To develop an ability to identify, formulate, and solve engineering problems.	Be able to approach a design problem successfully, taking decisions when there is not a unique answer.
4	To develop an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	Be proficient in the use of software for analysis and design.
5		Students attended this course are able to analyse and design the basic mechanical

		systems.
6		**At the end of this course, students should be able to recognize the formation and calculation methods of commonly used machine elements.**

13.706: NON-CONVENTIONAL MACHINING TECHNIQUES COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	The course aims in identifying the classification of unconventional machining processes.	After completion of course, the student shall understand the principle of working, mechanism of metal removal in the various unconventional machining process.
2	To understand the principle, mechanism of metal removal of various unconventional machining processes.	The student is able to identify the process parameters, their effect and applications of different processes.
3	To study the various process parameters and their effect on the component machined on various unconventional machining processes.	Upon completion of this course, the students can able to demonstrate different unconventional machining processes and know the influence of difference process parameters on the performance and their applications.
4	To understand the applications of different processes.	Ability to extend, through modeling techniques, the single point, multiple point and abrasive machining processes
5	To teach the machining surface	Estimate the material removal rate and

	finish and material removal rate	**cutting force, in an industrially useful manner, for practical machining processes**
6	**To teach the mechanics and thermal issues associated with chip formation**	**effects of tool geometry on machining force components and surface finish**

13.707: THERMAL ENGINEERING LAB COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	The objective of the thermal engineering laboratory is to introduce the student the fundamental theories and the industrial applications of thermodynamics, heat transfer, and fluid mechanics.	Compute the property of fuels and lubricating oils using suitable tests.
2	This laboratory supports the courses for the undergraduate and graduate studies.	Demonstrate the performance of internal combustion engines and air compressors.
3	Moreover, this laboratory also supports the advanced research in the area of thermal engineering, heat transfer, and fluid mechanics.	Interpret the emission characteristics of internal combustion engines.
4	To provide knowledge on testing of properties of fuels and lubricating oils	
5	To demonstrate and conduct	

	experiments, interpret and analyze data and report results of IC Engine testing	
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13.708: MECHANICAL ENGINEERING LAB COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To apply various measurement techniques to inspect and test products	Describe the fundamental concepts in measurement methods, techniques.
2	To apply statistical tools for quality assurance purpose	Apply various instruments for measurements
3	To test and evaluate various components using various measuring instruments	Apply quality control tools to achieve defects free quality products
4		Take precise measurements using various instruments.
5		Develop data for engineering analysis.
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COURSE OBJECTIVES AND COURSE OUTCOMES FOR S5

MECHANICAL

13.501: ENGINEERING MATHEMATICS IV COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To provide a basic understanding of random variables and probability distributions.	After successful completion of this course, the students will be familiar with the large scale applications of linear programming techniques which require only a few minutes on the computer.
2	Mathematical programming techniques are introduced as a part of this course.	Also they will be familiar with the concepts of probability distributions which are essential in transportation engineering.
3	These techniques are concerned with the allotment of available resources so as to minimize cost or maximize profit subject to prescribed restrictions.	
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13.502: THEORY OF MACHINES COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To understand the layout of linkages in the assembly of a system/machine. To study the application of friction in different devices.	Able to understand basic elements of mechanism
2	To study the principles involved in assessing the displacement, velocity and acceleration at any point in a link of a mechanism.	The students will be able to perform velocity analysis of mechanism
3	To analyse the motion resulting from a specified set of linkages in a mechanism.	The students will be able to perform acceleration analysis of mechanism
4	To study the power transmission devices.	The students will be able to perform dimensional synthesis of simple mechanisms mechanism
5		The students will be able to perform force analysis of belt drives
6		The students will be able to design clutch

		plate. The students will be able to perform analysis of gear trains

13.503: INDUSTRIAL ELECTRONICS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To explain the modelling of the power system using various methodologies.	Discuss Various components of Power System, their characteristics and Modelling.
2	To expose to formulation of power flow problems and various numerical methods for solving power flow Problems.	Draw equivalent single line reactance and impedance diagrams and per unit representation of a power system
	To Introduce abnormal system operating conditions of a power system namelysymmetrical and unsymmetricalfaults.	Explain significance of load flow problem and apply numerical techniques to obtain Load flow solution..
4	To Create Awareness on the concepts of Power system stability and their implications.	Interpret the effect of symmetrical fault conditions and select suitable rating for various protective devices in a. power system
5		Apply symmetrical components and solve

		unsymmetrical faults.in a power system.
6		**Discuss stability classifications and calculate stability limits using equal area criterion and numerical methods.**

13.504: MECHANICS OF MATERIALS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Develop the formal theory of solid mechanics : the equilibrium, kinematic, and constitutive equations.	To understand the concepts of stress at a point, strain at a point, and the stress-strain relationships for linear, elastic, homogeneous, isotropic materials. To determine principal stresses and angles, maximum shearing stresses and angles, and the stresses acting on any arbitrary plane within a structural element. To draw Free Body Diagrams (FBD) for rigid bodies, beams, 2-D and 3-D structures, frames and machines, and set up equilibrium equations (i.e. forces and couples) for them.
2	Introduce the atomistic mechanisms underlying the mechanical behavior of materials.	To discern between entropic and enthalpic contributions to deformation and know which dominate for different types of materials and why. To employ and set up phenomenological models that represent molecular

		mechanisms of deformation and use those models to predict macroscopic mechanical response, e.g. the linear theory of viscoelasticity. **To understand some basic relationships between molecular and microscopic and macroscopic mechanisms of deformation.**
3	**Instill a basic knowledge of the statistical aspects of mechanics of materials.**	**To understand how statistical mechanics can be employed to predict the macroscopic mechanical properties of polymers via the kinetic theory of rubber elasticity.** **To appreciate the statistical nature of fracture and fatigue, especially in high-strength, brittle materials, and to know how to design an acceptable level of risk for a particular component and application.** **To interpret and understand statistical data**

		of fracture and fatigue.
4	**Establish process - structure - property - performance relationships in materials engineering.**	**To appreciate multi-scale structure effects on material properties.**
5		**To learn the basics of materials selection by identifying appropriate criteria, categorizing materials and describing a range of properties available from similar materials.**
6		**To identify relationships between manufacturing processes and materials' behaviour and recognize the influence of composition and structure on the processsing and usage of materials.**

13.505: MACHINE TOOLS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	The course provides students with fundamental knowledge and principles in material removal processes.	Apply cutting mechanics to metal machining based on cutting force and power consumption.
2	In this course, the students apply the fundamentals and principles of metal cutting to practical applications through multiple labs using lathes, milling machines, grinding machines, and drill presses, Computer Numerical Control etc.	Operate lathe, milling machines, drill press, grinding machines, etc.
	To demonstrate the fundamentals of machining processes and machine tools.	Select cutting tool materials and tool geometries for different metals.
4	To develop knowledge and importance of metal cutting parameters.	Select appropriate machining processes and conditions for different metals.
5	To develop fundamental knowledge	Learn machine tool structures and

	on tool materials, cutting fluids and tool wear mechanisms.	**machining economics.**
6	**To apply knowledge of basic mathematics to calculate the machining parameters for different machining processes.**	**Write simple CNC programs and conduct CNC machining.**

13.506: NON-DESTRUCTIVE TESTING COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To introduce the basic principles, techniques, equipment, applications and limitations of NDT methods.	Discuss the basic principles, techniques, equipments used in NDT
2	To enable selection of appropriate NDT methods.	The students will be able to differentiate various defect types.
3	To identify advantages and limitations of non destructive testing methods.	Ability to apply scientific and technical knowledge to the field of non-destructive testing.
4	To make aware the developments and future trends in NDT.	Recognition of the need and ability to engage in lifelong learning, thought process and development
5		Ability to use the relevant non-destructive testing methods for various engineering practice.
6		Recognize and achieve high levels of professionalism in their work

13.507: PRODUCTION ENGINEERING LAB COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To acquaint the basics of lathe and accessories, shaping and slottng machine,planning machines	At the end of the course, the students will be familiar with the various operations using lathe, shaping, slotting and planning machines.
2	To learn the different tools used for various operations of machines.	Do simple machining operations.
3	To impart training on plane turning, groove cutting, form turning, taper turning,facing and thread cutting.	Conduct cutting force measurements.
4	To physically study machine tools and basic machining processes like milling, grinding etc.	Know the fundamental settings of milling machines and drilling machines.
5	To practice metal cutting in milling machines, tool-grinder machines, cylindrical grinding machines and surface grinding machines.	Understand the working of gear cutting mechanism and indexing.
6	To conduct measurement of metal	Understand the machining operations like

	cutting forces and understand their importance	**grinding and planing.**

13.508: ELECTRICAL & ELECTRONICS LAB COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To give a practical knowledge on the working of electrical machines including dc machines, transformers, induction motors and synchronous motors.	At the end of this course the students will be able to test and validate DC generators, DC motors and Transformers.
2	It also gives the basics about design and implementation of small electronic circuits	Students will have the basic knowledge on working of semiconductor devices.
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COURSE OBJECTIVES AND COURSE OUTCOMES FOR S3

MECHANICAL

MA201: LINEAR ALGEBRA & COMPLEX ANALYSIS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Identify complex-differentiable functions	Determine whether a given function is differentiable, analytic and if so find its derivative. To find harmonic conjugate
2	Use conformal mapping	Upon completion Conformal Mapping students will master concepts and theories of conformal mappings of simply connected and multiply connected domains.
3	Compute complex line integrals	Find parametrizations of curves, and compute complex line integrals directly. Use antiderivatives to compute line integrals. Use Cauchy's integral theorem and formula to compute line integral. Express complex-differentiable functions as power series.
4	Use the residue theorem.	Identify the isolated singularities of a function and determine whether they are

		removable, poles, or essential. Use the residue theorem to compute complex line integrals and real integrals.
5	**Learn to solve systems of linear equations and application problems requiring them. Learn about and work with vector spaces and subspaces.**	**Demonstrate ability to manipulate matrices and to do matrix algebra. Demonstrate ability to solve systems of linear equations. Demonstrate ability to work within vector spaces and to distil vector space properties.**
6	**Learn to find and use eigenv alues and eigenvectors of a matrix.**	**Find the characteristic equation, eigenvalues and corresponding eigenvectors of a given matrix.**

ME201: MECHANICS OF SOLIDS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	**To acquaint with the basic concepts of stress and deformation in solids.**	**Understand basic concepts of stress and strain in solids.**
2	**To practice the methodologies to analyse stresses and strains in simple structural members, and to apply the results in simple design problems.**	**Determine the stresses in simple structural members such as shafts, beams, columns etc. and apply these results in simple design problems.**
3	**To study about shear force and bending moment of beams loaded in different conditions.**	**Determine principal planes and stresses, and apply the results to combined loading case.**
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ME 203: MECHANICS OF FLUIDS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To study the mechanics of fluid motion.	Calculate pressure variations in accelerating fluids using Euler's and Bernoulli's equations
2	To establish fundamental knowledge of basic fluid mechanics and address specific topics relevant to simple applications involving fluids	Become conversant with the concepts of flow measurements and flow through pipes
3	To familiarize students with the relevance of fluid dynamics to many engineering systems	Apply the momentum and energy equations to fluid flow problems.
4		Evaluate head loss in pipes and conduits.
5		Use dimensional analysis to design physical or numerical experiments and to apply dynamic similarity

ME205: THERMODYNAMICS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	**To understand basic thermodynamic principles and laws**	**Understand the laws of thermodynamics and their significance**
2	**To develop the skills to analyze and design thermodynamic systems.**	**Apply the principles of thermodynamic for the analysis of thermal systems**
3	**To enable students to be more aware of the behavior of materials in engineering applications and select the materials for various engineering applications based on their thermal properties.**	**Understand the applications of thermodynamics**
4	**To understand the thermal devices completely**	**Recognize the relations exhibited in thermodynamics.**
5	**To determine thermal properties of**	**Select materials for applications as per their**

	unknown materials and develop an awareness to apply this knowledge in material design.	**thermal properties.**
6		**Apply core concepts in thermodynamics to solve engineering problems.**

ME210: METALLURGY AND MATERIALS ENGINEERING COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	**To provide fundamental science relevant to materials.**	**Identify the crystal structures of metallic materials.**
2	**To provide physical concepts of atomic radius, atomic structure, chemical bonds, crystalline and non-crystalline materials and defects of crystal structures, grain size, strengthening mechanisms, heat treatment of metals with mechanical properties and changes in structure.**	**Analyze the binary phase diagrams of alloys Fe-Fe3C, etc.**
3	**To enable students to be more aware of the behavior of materials in engineering applications and select the materials for various**	**Correlate the microstructure with properties, processing and performance of metals.**

	engineering applications.	
4	**To understand the causes behind metal failure and deformation.**	**Recognize the failure of metals with structural change.**
5	**To determine properties of unknown materials and develop an awareness to apply this knowledge in material design.**	**Select materials for design and construction.**
6		**Apply core concepts in materials science to solve engineering problems.**

HS210: LIFE SKILLS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To develop communication competence in prospective engineers.	Communicate effectively.
2	To enable them to convey thoughts and ideas with clarity and focus. To develop report writing skills.	Make effective presentations.
	To equip them to face interview & Group Discussion.	Write different types of reports.
4	To inculcate critical thinking process.	Face interview & group discussion
5	To prepare them on problem solving skills.	Critically think on a particular problem.
6	To provide symbolic, verbal, and graphical interpretations of statements in a problem description.	Handle Engineering Ethics and Human Values.

ME231: COMPUTER AIDED MACHINE DRAWING LAB COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To introduce students to the basics and standards of engineering drawing related to machines and components.	Acquire the knowledge of various standards and specifications about standard machine components.
2	To teach students technical skills regarding assembly, production and part drawings.	Make drawings of assemblies with the help of part drawings given.
3	To familiarize students with various limits, fits and tolerances.	Ability to select, configure and synthesize mechanical components into assemblies.
4	To help students gain knowledge about standard CAD packages on modeling and drafting.	Apply the knowledge of fits and tolerances for various applications.
5		Able to model components of their choice using CAD software.
6		Get exposure to advanced CAD packages.

CE230: MATERIAL TESTING LAB COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	**To provide knowledge on mechanical behaviour of materials**	**Acquire the knowledge on mechanical behaviour of materials**
2	**To acquaint with the experimental methods to determine the mechanical properties of materials.**	**Conduct experiments determine the mechanical properties of materials.**

COURSE OBJECTIVES AND COURSE OUTCOMES FOR S1

MECHANICAL

MA 101: CALCULUS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To give the definition of an infinite series and explain what is meant by the sequence of partial sums. Relate the convergence or divergence of the series to the sequence of partial sums.	Evaluate the limit of a sequence of numbers (infinite series) and determine whether the series converges.
2	Compute partial derivatives of functions of several variables. Apply the theorem on mixed partial derivatives.	Understand the meaning of partial derivatives and calculate partial derivatives.
3	Use concepts of calculus to the model real-world problems	Compute dot product, cross product, length of vectors. Compute partial derivatives, derivatives of vector-valued functions, gradient functions.

4	**Evaluate volumes of bounded solids and areas of bounded regions by using the ideas of double and triple integrals.**	**To change a double integral to polar co ordinate. Compute (relatively simple) triple integrals**
5	**Apply the concept of line integral to work and circulation. Know the definition and properties of conservative vector fields and their relationship to gradient fields.**	**Determine if a vector field is conservative and find a potential function if conservative. Evaluate line integrals in the plane and in space, including line integrals of vector fields.**
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PH100: ENGINEERING PHYSICS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	**Dynamics of mechanical and electrical oscillation using Fourier series and integrals; time and frequency representations for driven damped oscillators, resonance; one-dimensional waves in classical mechanics and electromagnetism; normal modes.**	**Solve for the solutions and describe the behavior of a damped and driven harmonic oscillator in both time and frequency domains. Damped and Forced Oscillations oscillating system problems.**
2	**The fundamental principles of photonics that complement the topics in the optics and laser courses and to help students develop problem-solving skills applicable to real-world photonics problems.**	**Define and explain the propagation of light in conducting and non-conducting media.**
3	**Introduce basic concepts and**	**Define and explain the physics governing**

	principles of acoustics.	**laser behaviour and light matter interaction ting and non-conducting media.**
4		**Apply wave optics and diffraction theory to a range of problems**
5		**Explain and calculate the physical effects of acoustic reflections, absorption, scattering, diffusion, diffraction, and propagation losses.**
6		**Use advanced theoretical, numerical, and experimental techniques to model and analyze acoustical elements in musical instruments, the human voice, room acoustics, and audio.**

BE100: ENGINEERING MECHANICS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To apply the principles of mechanics to practical engineering problems.	Understand the fundamental concepts of mechanics.
2	To identify appropriate structural system for studying a given problem and isolate it from its environment.	Students would be able to apply and demonstrate the concepts of resultant and equilibrium of force system.
3	To develop simple mathematical model for engineering problems and carry out static analysis.	Students would be able to determine the properties of planes and solids.
4	To develop simple mathematical model for engineering problems and carry out static analysis.	Understand the concepts of moment of inertia.
5		Students would be able to apply fundamental concepts of dynamics to

		practical problems.
6		**Understand the basic elements of vibration.**

BE 101-02: INTRODUCTION TO MECHANICAL ENGINEERING COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To introduce different disciplines of Mechanical Engineering.	Enable students to distinguish different processes around them by applying knowledge in thermodynamics.
2	To kindle interest in Mechanical Engineering.	To explain the working of different energy conversion devices.
3	To impart basic mechanical engineering principles.	To differentiate between refrigeration and air conditioning devices and describe their working.
4		To recognize different parts of an automobile and explain their working.
5		To enumerate various engineering materials used in manufacturing industries.
6		Indicate the appropriate manufacturing method for production.

BE 103: INTRODUCTION TO SUSTAINABLE ENGINEERING COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To have an increased awareness among students on issues in areas of sustainability.	Able to appreciate and explain the different types of environmental pollution problems and their sustainable solutions
2	To have an insight into global environmental issues.	To be aware of problem related to global environmental issues
3	To establish a clear understanding of the role and impact of various aspects of engineering and engineering decisions on environmental, societal, and economic problems.	Able to apply the concepts of sustainability in their respective area of specialization
4	Tounderstandtheroleof engineering in achieving sustainable world	To understand the need of waste disposal and management
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EC 100: BASICS OF ELECTRONICS ENGINEERING COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To get basic idea about types, specification and common values of passive components.	Student can identify the active and passive electronic components.
2	To familiarise the working and characteristics of diodes transistors, MOSFET and some measuring instruments.	Student can setup simple circuits using diodes, transistors and other electronic components.
3	To understand working of diodes in circuits and in rectifiers.	Student will get fundamental idea about basic communication and entertainment electronics.
4	To understand the concept of mobile networks.	Student will get fundamental idea about mobile operation.
5		Student will get fundamental idea about different electronic circuits.

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PH 103 : ENGINEERING PHYSICS LAB COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Competency in an engineering or science profession via promotion to positions of increasing responsibility, publications, and/orconference presentations.	An ability to apply knowledge of mathematics, science, and engineering.
2	Adaptability to new developments in science and technology by successfully completing or pursuing graduate education in engineering or related fields, or participating in professional development and/or industrial training courses.	An ability to design and conduct experiments, as well as to analyze and interpret data.
3		An ability to identify, formulate, and solve engineering problems
4		Understanding of professional and ethical responsibility

5		**The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context**
6		**A recognition of the need for, and an ability to engage in life-long learning**

EC 110 ELECTRONICS ENGINEERING WORKSHOP COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To gives the basic introduction of electronic hardware systems.	Students can identify the active and passive electronic components.
2	To provide hands on training with familiarization, testing, assembling.	Students get hands on assembling, dismantling and repairing systems.
3	To develop knowledge of electrical wiring and electronic circuits.	Drawing of electronic circuit diagrams using BIS/ IEEE symbols.
4	To use the various tools and instruments available in the Electronic Workshop.	Testing of electronic components (Resistor, Capacitor, Diode)
5		Assembling of electronic circuit / system on general purpose PCB.
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ME 110: MECHANICAL WORKSHOP COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Introduction to basic manufacturing process like welding, moulding, fitting, assembling, smithy, carpentry works etc.	Knowledge achieved to explain the various manufacturing process in the basic mechanical engineering workshop sections-smithy, carpentry, assembling, welding etc.
2	Familiarization of basic manufacturing hand tools and equipment like files, hacksaw, spanner chisel hammers, etc.	Identify the various hand tools used in the basic mechanical engineering workshop sections-smithy, carpentry, assembling, welding etc.
	Familiarization of various measuring devises like vernier height gauge, vernier caliper, micrometer, steel rule etc.	Able to choose different measuring devises according to the work.
4	Demonstration and study of various machine tools like lathe, drilling machine, milling machine etc.	Ability to name and summarise the operations of various machine tools like lathe, milling, drilling and shaping

		machines.
5	**Familiarizing the disassembling and assembling of machine parts.**	**Knowledge achieved to disassemble and assemble the machine like IC engines.**
6		**Skill achieved to construct models by using basic mechanical workshop sections like welding, moulding, smithy, carpentry etc.**

2016-2017

Even Semester

COURSE OBJECTIVES AND COURSE OUTCOMES FOR S8

MECHANICAL

13.801: ENERGY MANAGEMENT COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Familiarizing with management, especially with management in energy sector engineering.	Understanding basics of demand side management and mechanisms (technical, legal or financial) that influence energy consumption.
2	Fundamentals of product strategy management.	Recognizing opportunities for increasing rational use of energy.
3	Describe energy supply pressures and government actions	Learning the basics of energy auditing with application on different sectors.
4	Explain effective energy management as a multi-dimensional activity	
5	Studying methods of energy accounting and energy auditing in energy sector, industry and final	

	consumption.	
6	**Finding opportunities to increase the rational use of energy.**	

13.802: INDUSTRIAL ENGINEERING COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Apply engineering principles to the work environment	An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities
2	Use quality tools and data to anticipate and solve issues in the engineering process	An ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies
3	Work collaboratively	An ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes
4	Be employed as a practicing engineer in fields such as design, research, development, testing, manufacturing,	An ability to design systems, components, or processes for broadly-defined engineering

	operations and service systems	**technology problems appropriate to program educational objectives**
5	**Assume positions of leadership and responsibility within an organization**	**An ability to function effectively as a Member or leader on a technical team**
6		**An ability to identify, analyze, and solve broadly-defined engineering technology problems**

13.803: AUTOMOBILE ENGINEERING COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	The anatomy of the automobile in general	Identify the different parts of the automobile
2	The location and importance of each part	Explain the working of various parts like engine, transmission, clutch, brakes
3	The functioning of the engine and its accessories, gear box, clutch, brakes, steering, axles and wheels	Describe how the steering and the suspension systems operate.
4	Suspension, frame, springs and other connections	Understand the environmental implications of automobile emissions
5	Emissions, ignition, controls, electrical systems and ventilation	Develop a strong base for understanding future developments in the automobile industry
6		

13.804: COMPUTER INTEGRATED MANUFACTURING COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	This course aims to acquaint the students with principles, concepts and techniques that are essential in Computer Integrated Manufacturing.	Students will develop an understanding of CAD systems and graphical modeling.
2	Understanding of the scope, principles, norms, accountabilities and bounds of contemporary engineering practice in the specific discipline	Students will get acquainted with data bases and numerical analysis related to CIM
3	Application of established engineering methods to complex engineering problem solving	Students will have understanding of Computer Aided Manufacturing (CAM) systems
4	Fluent application of engineering techniques, tools and resources	Students will have an introduction to Computer Aided Process Planning (CAPP) Systems, Robotic Systems, Group Technology and Cellular Manufacturing

		Systems
5		**Students will cultivate understanding about Automated Material Handling Systems, Automated Inspection System**
6		

13.805: FACILITIES PLANNING COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To provide understanding of the overall facilities planning process	At the end of the course students will be able to Assess the value of facility planning on the strategy of a firm
2	To educate product, process and schedule design and their effects on the facility layout	Develop a systematic plant layout
3	To introduce concepts of material handling and safety in industries.	Discuss the environmental and economical aspects in facilities planning.
4	To Create Awareness on the concepts of designing of industrial layout	
5		
6		

13.806: FLEXIBLE MANUFACTURING METHODS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To give elementary ideas of automation in industries	After completion of this course the students will be able to Employ automation in a manufacturing environment
2	To develop NC programming skills	Describe the fundamentals of NC technology
3	To provide an overview of features of robotics.	Design an automated system to meet defined operational specifications
4	To Create Awareness on the concepts of simulation	Acquire knowledge of industrial robotics and Flexible Manufacturing Systems
5		Identify and distinguish the different components and interfaces in a Flexible manufacturing System.
6		Able to know about the design of an FMS system

13.807: INDUSTRIAL SEMINAR COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	The main objective of this course is to provide experience in presentations and to improve their communication skills.	Acquire the basic skills to perform literature survey and present papers
2		Acquire communication skills
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13.808: PROJECT, VIVA-VOCE AND INDUSTRIAL VISIT COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To do a detailed study on a selected topic based on current journals or published papers.	Acquire the basic skills to perform literature survey and present papers
2	To impart the ability to perform as an individual as well as a team member in completing a project work.	Acquire communication skills and improve their leadership quality as well as the ability to work in groups.
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COURSE OBJECTIVES AND COURSE OUTCOMES FOR S6

MECHANICAL

13.601: METROLOGY & INSTRUMENTATION COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To understand the basic principles of measurements.	To know about quality control and quality assurances.
2	To learn the various linear and angular measuring equipments, their principle of operation and applications.	To design a sensors and transducers used for measurements.
3	To learn about various methods of measuring Mechanical parameters.	To understand the importance of quality in engineering products.
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13.602: DYNAMICS OF MACHINERY COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To impart knowledge on force analysis of machinery,	Develop the design and practical problem solving skills in the area of mechanisms
2	To impart knowledge on balancing of rotating and reciprocating masses	The students will be able to perform dynamic force analysis
3	To impart knowledge on Gyroscopes, Energy fluctuation in Machines.	The students will be able to design fly wheels
4	To introduce the fundamentals in vibration, vibration analysis of single degree of freedom systems.	The students will be able to design governors. The students will be able to analyze gyroscopic effect in various real world problems
5	To understand the physical significance and design of vibration systems with desired conditions	The students will be able to perform dynamic balancing of rotating as well as reciprocating parts of machines.
6		Understand the basics of vibration and apply the concepts in design

		problems of mechanisms.

13.603: COMPUTER AIDED DESIGN COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To equip students with fundamentals of computer aided design and to provide elementary algorithms in computer graphics and finite element analysis for basic engineering problems	Students successfully completing this course are expected to have basic knowledge in computer aided design, capability to prepare fundamental graphics algorithms and solve basic structural problems using finite element method.
2	To introduce the student to the basic tools of computer-aided design (CAD) and computer-aided manufacturing (CAM).	Be able to use a commercial CAD/CAM software package as an engineering tool
3	To expose the student to contemporary computer design tools for aerospace and mechanical engineers.	Integrate the role of graphic communication in the engineering design process
4	To prepare the student to be an effective user of a CAD/CAM system.	Generate and interpret engineering technical drawings of parts and assemblies according to engineering design standards.
5		Use CAD software to generate a computer

		model and technical drawing for a simple, well-defined part or assembly.
6		

13.604: HEAT AND MASS TRANSFER COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To introduce a basic study of the phenomena of heat and mass transfer, to develop methodologies for solving a wide variety of practical engineering problems,	Understand the basic laws of heat transfer.
2	To apply analytical and numerical methods to solve conduction problems.	Apply principles of heat and mass transfer to basic engineering systems
3	To combine thermodynamics and fluid mechanics principles to analyze heat convection processes.	Demonstrate general knowledge of heat transfer [conduction, convection, radiation], and general knowledge of mass transfer [molecular diffusion, convection].
4	To provide useful information concerning the performance and design complex heat transfer	Analyse the performance and design of heat exchangers.

	applications, such as heat exchangers and fins	
5	**To integrate radiation aspects into real-world global heat transfer problems.**	**Design heat and mass transfer processes and equipment**
6		

13.605: DESIGN OF MACHINE ELEMENTS I COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To provide basic knowledge on the design considerations and methodology of various machine elements.	demonstrate the fundamentals of stress analysis and theories of failure in the design of machine components.
2	At the end of this course, students will be able to formulate and analyze stresses and strains in machine elements and structures in 3-D subjected to various loads	make proper assumptions with respect to material, factor of safety, static and dynamic loads for various machine components.
3	At the end of this course, students will be able to do tolerance analysis and specify appropriate tolerances for machine design applications	Be able to analyze the stress and strain on mechanical components; and understand, identify and quantify failure modes for mechanical parts
4	At the end of this course, students will be able to apply multidimensional static failure criteria in the analysis and design of mechanical components	Demonstrate knowledge on basic machine elements used in machine design; design machine elements to withstand the loads and deformations for a given application, while considering additional specifications.

5	**To develop an ability to design a system, component, or process to meet desired needs within realistic constraints.**	**Be able to approach a design problem successfully, taking decisions when there is not a unique answer.**
6		**Be proficient in the use of software for analysis and design.**

13.606: NEW ENERGY SYSTEMS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To provide an overview of various energy sources and its applications.	To explain the use of newer energy sources and their applications.
2	To aware about the need of newer energy sources to meet the extending demands.	To design and develop various bio-gas plants. .
3	To understand the theories and principles behind various energy systems.	To understand the various practical fuel cells
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13.607: COMPUTER AIDED MODELLING & ANALYSIS LAB COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To train the students in Solid Modelling and Assembly of machine parts.	At the end of the course, students shall be able to understand various phases in engineering design process through modelling, assembly and finite element analysis.
2	To practice finite element approach in the design of engineering systems.	
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13.608: MACHINE TOOLS LAB COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To acquaint with milling machines, grinding machines and drilling machines and to impart training on these machines.	At the end of the course, the students will be familiar with the various operations using milling machines, grinding machines, drilling machines and CNC machines.
2	To acquaint with CNC machines and to impart training on these machines.	Students will be able to develop practical knowledge in advanced machine tools like Shapping machine, Milling machine etc
3	To introduce the students to various welding techniques.	Students will be able to apply fundamental knowledge and principles in material removal processes
4		Ability to develop fundamental knowledge in indexing process for manufacturing gears and cutting slots
5		Students will create models using Milling, Shapping and Slotting processes as per the design
6		

COURSE OBJECTIVES AND COURSE OUTCOMES FOR S4

MECHANICAL

MA202: PROBABILITY DISTRIBUTIONS, TRANSFORMS AND NUMERICAL METHODS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Providing students with a formal treatment of probability theory.	Develop problem-solving techniques needed to accurately calculate probabilities.
2	Equipping students with essential tools for statistical analyses at the graduate level.	Apply selected probability distributions to solve problems.
3	The goal is to provide the basic understanding of the derivation analysis and use of these numerical methods along with the rudimentary understanding of finite precision arithmetic.	Apply problem-solving techniques to solving real-world events.
4	Apply the appropriate numerical techniques for problems	Be aware of the use of numerical methods in modern scientific computing. Be familiar with finite precision computation. Be familiar with

		numerical solutions of nonlinear equations in a single variable.
5		Be familiar with numerical interpolation and approximation of functions. Be familiar with numerical integration and differentiation
6		Be familiar with numerical solution of ordinary differential equations. Be familiar with calculation and interpretation of errors in numerical methods.

ME202: ADVANCED MECHANICS OF SOLIDS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	**To impart concepts of stress and strain analyses in a solid.**	**At the end of the course students will be able to Apply concepts of stress and strain analyses in solids.**
2	**To study the methodologies in theory of elasticity at a basic level.**	**Use the procedures in theory of elasticity at a basic level.**
3	**To acquaint with the solution of advanced bending problems.**	**Solve general bending problems.**
4	**4. To get familiar with energy methods for solving structural mechanics problems.**	**Apply energy methods in structural mechanics problems**
5		
6		

ME204: THERMAL ENGINEERING COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To acquire knowledge on the working of steam turbines, IC engines and gas turbines	Integrate the concepts, laws and methodologies from the course in thermodynamics into analysis of cyclic processes
2	To introduce the combustion process in IC engines	To apply the thermodynamic concepts into various thermal application like IC engines, Steam Turbines, Compressors.
3	To understand air pollution from IC engines and its remedies.	The students will be able to design I. C. Engines depending upon the requirements.
4	Be in a position to check the feasibility of proposed processes and cycles using the ideas of second law of thermodynamics and entropy.	They also will be able to do final year project on such highly demanding subject area
5	Have the understanding of basic principles of heat transfer and related simple problems	It also provides students a feel for how thermal sciences are applied in engineering practice.

6		

ME206: FLUID MACHINERY COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	**To introduce students, the fundamental concepts related to the mechanics of fluids.**	**Knowledge on basic concepts of fluid properties.**
2	**To understand the basic principles of fluid machines and devices.**	**Analyze flow problems associated with statics, kinematics and dynamics of fluids.**
3	**To apply acquired knowledge on real life problems.**	**Use Euler's and Bernoulli's equations and the conservation of mass to determine velocities, pressures, and accelerations for incompressible and inviscid fluids.**
4	**To analyze existing fluid systems and design new fluid systems.**	**Understand the concepts of viscous boundary layers and the momentum integral.**
5		**Design and analyze fluid devices such as water turbines and pumps.**
6		**Understand and rectify problems faced in practical cases of engineering applications.**

ME220: MANUFACTURING TECHNOLOGY COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To give an exposure to different techniques of casting and molds required.	Acquire knowledge of various casting processes and technology related to them is achieved
2	To provide an exposure to different rolling processes and different rolled products	Understand the rolling passes required for getting required shapes of rolled products is achieved. Mathematical and physical description of the rolling process and forge requirement will be obtained.
3	To familiarize with different forging methods, cautions to be adopted in die design.	Discuss Important aspects of forging techniques
4	To give an introduction to various work and tool holding devices used in manufacturing.	Discuss sheet metal working processes and their applications to produce various shapes and products is obtained.
5	To introduce to the bending, shearing and drawing processes of sheet metal working and allied	Acquire knowledge of problems faced in welding and ways to solve them is obtained.

	machines,	
6	**To give an understanding of welding metallurgy and weldability and to introduce various metal joining techniques.**	**Also conventional and special welding techniques used in industry will be introduced.**

HS200: BUSINESS ECONOMICS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	**To familiarize the prospective engineers with elementary Principles of Economics and Business Economics.**	**Make investment decisions based on capital budgeting methods in alignment with micro economic theories.**
2	**To acquaint the students with tools and techniques that are useful in their profession in Business Decision Making which will enhance their employability;**	**Make investment decisions based on capital budgeting methods in alignment with macro economic theories.**
3	**To apply business analysis to the "firm" under different market conditions.**	**Analyse the profitability of the firm, economy of operation.**
4	**To apply economic models to examine current economic scenario and evaluate policy options for addressing economic issues.**	**Determination of price under various market situations with good grasp on the effect of trade cycles in business.**
5		**Gain knowledge of elementary accounting concepts used for preparing balance sheet**

		and **interpretation of balance sheet.**
6		

ME232: THERMAL ENGINEERING LAB COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To study the various types IC engines and their parts	Determine the efficiency and plot the characteristic curves of different types of Internal Combustion engines, compressors and blowers
2	To conduct the performance test on IC engines, compressors and blowers	Conduct experiments for the determination of viscosity, calorific value etc of petroleum products
3	To familiarize equipment used for measuring viscosity, flash and fire point and Calorific value of petroleum products	Compute the property of fuels and lubricating oils using suitable tests.
4	To provide knowledge on testing of properties of fuels and lubricating oils	Demonstrate the performance of internal combustion engines and air compressors.
5	To demonstrate and conduct experiments, interpret and analyze data and report results of IC Engine	Interpret the emission characteristics of internal combustion engines.

	testing	
6		

ME230: FLUID MECHANICS & MACHINES LAB COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To demonstrate the applications of the basic fluid mechanics and hydraulic machines and to provide a more intuitive and physical understanding of the theory.	Discuss physical basis of Bernoulli's equation, and apply it in flow measurement (orifice, Nozzle and Venturi meter), and to a variety of problems
2	To provide practical knowledge in verification of principles of fluid flow.	Determine the efficiency and plot the characteristic curves of different types of pumps and turbines.
3	To impart knowledge in measuring pressure, discharge and velocity of fluid flow.	To provide the students with a solid foundation in fluid flow principles.
4	To understand Major and Minor Losses.	To provide the students knowledge in calculating performance analysis in turbines and pumps and can be used in power plants.
5	To gain knowledge in performance testing of Hydraulic Turbines and	Students can able to understand to analyze practical problems in all power plants and

	Hydraulic Pumps at constant speed and Head.	**chemical industries.**
6		**Conduct experiments (in teams) in pipe flows and open-channel flows and interpreting data from model studies to prototype cases.**
7		**Analyze a variety of practical fluid-flow devices and utilize fluid mechanics principles in design.**
8		**Given the required flow rate and pressure rise, select the proper pump to optimize the pumping efficiency.**

COURSE OBJECTIVES AND COURSE OUTCOMES FOR S1

MECHANICAL

MA 102 - DIFFERENTIAL EQUATIONS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To put it briefly, the point of this class is to take your existing knowledge of calculus and apply it towards the construction and solution of mathematical models in the form of differential equations.	Distinguish between linear, partial and ordinary differential equations. State the basic existence theorem for 1st order ODE's and use the theorem to determine a solution interval
2	Solve non-homogeneous linear equations with constant coefficients using the methods of undetermined coefficients and variation of parameters.	Recognize and solve a non homogeneous differential equation. Find particular solutions to initial value problems.
3	Introduce the Fourier series and its application to the solution of partial differential equation.	Find the Fourier series representation of a function of one variable.

4	**To provide the student with the concept and the understanding of basics in Partial Differential Equations.**	**Knowledge in the Technic, methodology of solving Partial Differential Equations. A basic understanding in the Transforms which are useful in solving engineering problems.**
5	**This course introduces ideas of wave equation and heat equation which are widely used in the 61 modeling and analysis of a wide range of physical phenomena and has got applications across all branches of engineering.**	**At the end of the course students will have acquired basic knowledge of differential equations and methods of solving them and their use in analyzing typical mechanical or electrical systems.**
6		

CY 100: ENGINEERING CHEMISTRY COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To acquire knowledge about desalination of brackish water and treatment of municipal water.	Develop innovative methods to produce soft water for industrial use and potable water at cheaper cost.
2	To gain the knowledge of conducting polymers, bio-degradable polymers and fibre reinforced plastics.	Substitute metals with conducting polymers and also produce cheaper biodegradable polymers to reduce environmental pollution. Design economically and new methods of synthesis nano materials.
	To learn significance of green chemistry and green synthesis.	Have the knowledge of converting solar energy into most needy electrical.
4	To understand mechanism of corrosion and preventive methods.	Apply their knowledge for protection of different metals from corrosion.To prevents the monuments from getting corroded.
5	To have an idea and knowledge about the Chemistry of Fuels.	Recent trends in electrochemical energy storage devices.
6	To study different types of spectroscopy.	Learn how to use different spectroscopy techniques for analysis purpose of simple molecules.

ME 102: ENGINEERING GRAPHICS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Increase ability to communicate with people.	To hand letter will improve.
2	Learn to sketch and take field dimensions.	To perform basic sketching techniques will improve.
3	Learn to take data and transform it into graphic drawings.	To draw orthographic projections and sections.
4	Learn basic Auto Cad skills.	To use architectural and engineering scales will increase.
5	Learn basic engineering drawing formats	To produce engineered drawings will improve
6	Prepare the student for future Engineering positions	To convert sketches to engineered drawings will increase.

BE 103: DESIGN AND ENGINEERING COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To excite the student on creative design and its significance	To appreciate different elements involved in design and to apply them when they called for.
2	To make the student aware of the processes involved in design	Aware of product centred and user centred aspects that makes in the design process.
3	To make the student understand the interesting interaction of various segments of humanities, sciences and engineering in the evolution of a design	To be aware of different stages in design process and results of incorporating other fields with engineering stream
4	To get an exposure as to how to engineer a design.	Understand different stages in manufacturing of a designed product
5		
6		

CE 100: BASICS OF CIVIL ENGINEERING COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To inculcate the essentials of civil engineering field to the students of all branches	The students will be able to illustrate the fundamental aspects of civil engineering
2	To provide the students an illustration of the significance of the civil engineeringprofessionsatisfying societal needs.	The students should able to plan a building
3		Students will be able to explain about surveying for making horizontal and vertical measurements.
4	.	They will able to illustrate the uses of various building materials and construction of different components of a building.
5		
6		

EE 100: BASICS OF ELECTRICAL ENGINEERING COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To impart a basic knowledge in Electrical Engineering with an understanding of fundamental concepts.	Gain preliminary knowledge in basic concepts of Electrical Engineering.
2	To impart the basic knowledge about the Electric and Magnetic circuits.	Discuss the working of various dc and ac machines
	To inculcate the understanding about the AC fundamentals.	To predict the behavior of any electrical and magnetic circuits.
4	To understand the working of various Electrical Machines.	To identify the type of electrical machine used for that particular application.
5		To wire any circuit depending upon the requirement.
6		Understand working principle of various analogue electrical measuring instruments.

CY 110 : ENGINEERING CHEMISTRY LAB COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To make students familiarize with the practical aspects of volumetric analysis of water samples ad determine the parameters like alkalinity, chlorides and hardness.	To equip the students to apply the knowledge of Chemistry and take up Chemistry related topics as parts of their project works during higher semester of the course.
2	To improve the knowledge of different types of titrations used in volumetric analysis	To impart sound knowledge in the different fields of theoretical chemistry so as to apply it to the problems in engineering field. (b) To develop analytical capabilities of students so that they can characterize, transform and use materials in engineering and apply knowledge gained in solving related engineering problems
3	To make students develop in terms of practical skills required for analytical projects.	To develop abilities and skills that are relevant to the study and practice of Chemistry.
4	To study flash and fire point	To familiarize the students with different application oriented topics like new

		generation engineering material different instrumental methods etc.
5		**To enable the students to acquire the knowledge in the concepts of chemistry for engineering applications.**
6		

EE 110 ELECTRICAL ENGINEERING WORKSHOP COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Study and practice on electric circuits	Draw and practice simple house wiring and testing methods
2	To develop skills leading to achievement to connect basic electrical instruments and devices	Develop practical workshop skills in the students.
3	To develop knowledge of electrical wiring and electronic circuits.	Grasp the applications of workshop equipment, wiring accessories etc
4	Various technical facilities used by electricians, wiring regulations, types of cables and electric accessories including switches, lamps, sockets etc.	Physical realization of the range of discrete and integrated semiconductor devices
5		Knowledge of protective devices in electric circuits like fuse, ELCB, MCB etc.
6		

CE110 CIVIL ENGINEERING WORKSHOP COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To inculcate the essentials of civil engineering field to the students of all branches.	The ability to practice civil engineering using up-to-date techniques, skills, and tools as a result of life-long learning ability to design and conduct experiments
2	To provide the students an illustration of the significance of the civil engineering profession satisfying societal needs.	An ability to design a system or component to satisfy stated or code requirements of Civil Engineering.
3	To develop awareness about the instruments used in civil engineering field work.	The students will be able to illustrate the fundamental aspects of civil engineering
4	.	The students should able to plan a building