2019-20

MECHANICAL ENGINEERING

ACADEMIC YEAR 2019-2020

S1 ME (2019 Batch)- KTU 2019 Scheme

SL NO	COURSE CODE	SUBJECT NAME	STAFF HANDLED
1	MA 101	Linear Algebra and Calculus	Sangeetha S
2	CYT 100	Engineering Chemistry	Renju R
3	EST 100	Engineering Mechanics	Sasi K S
4	EST 130	Basics Of Electrical And Electronics Engineering	Seethu V & Prajeesh R
5	HUN 101	Life Skill	Sreeti Gangadharan
6	CYL 120	Engineering Chemistry lab	Renju R
7	ESL 120	Electrical And Electronics Workshop	Rahul p raj, chinju

S3 ME (2018 Batch)

Sl no	Course code	Subject name	Staff handled
1	MA201	Linear Algebra & Complex Analysis	Ms.Ambady
2	ME201	Mechanica of Solids	Mr Rantheesh J
3	ME203	Mechanics of Fluids	Mr Yadhu Krishnan
4	ME205	Thermodynamics	Mr Vinod V
5	ME210	Metallurgy & Materials Engineering	Mr Sachin S
6	HS210	Life Skill	Mrs Sony S
7	ME231	Production Engineering Drawing	Mr Dileep Kumar C
8	ME230	Fluid Mechanics & Machinery Lab	Mr Sachin S

S5 ME (2017 Batch)

Sl no	Course code	Subject name	Staff handled
1	ME301	Mechanics of Machinery	Mr Sangeeth S K
2	ME303	Machine Tools and Digital Manufacturing	Mr Rantheesh J
3	ME305	Computer Programming & Numerical Methods	Mrs Neethu Krishna
4	EE311	Electrical DrivSes &Control for Automation	Mrs Karthika
5	HS300	Principles of Management	Mr John P George
6	ME367	Non-Destructive Testing	Mr Rahul P John
7	ME341	Design Project	Mr Rantheesh J
8	EE335	Electrical and Electronics Lab	Mr Rahul P raj
9	ME331	Manufacturing Technology Lab I	Mr Sumanlal M S

S7 ME (2016 Batch)

Sl no	Course code	Subject name	Staff handled
1	ME401	Design of Machine Elements I	Mr Sumanlal M S
2	ME403	Advanced Energy Engineering	Mr Yadhu Krishnan

3	ME405	Refrigeration and Air Conditioning	Mr Sachin S
4	ME407	Mechatronics	Mr Arya P Mohan
5	ME409	Compressible Fluid Flow	Mr Rahul P John
6	ME463	Automobile Engineering	Mr Akhil Vikram
7	ME451	Seminar & Project Preliminary	Mr Arya P Mohan
8	ME431	Mechanical Engineering Lab	Mr Yadhu Krishnan

EVEN SEMESTER

S2 ME (2019 Batch)- KTU 2019 Scheme

Sl no	Course code	Subject name	Staff handled
1	PHT 100	Engineering Physics A	Dr Sasi B
2	EST 110	Engineering Graphics	Sasi K S
3	EST 120	Basics of Civil & Mechanical Engineering	John P George, Jayalaksmi
4	PHL 120	Engineering Physics Lab	Dr Sasi B
5	ESL 130	Civil & Mechanical Workshop s2	Jayalakshmi, Arya P
6	MAT102	Vector Calculus, Differential Equation & Transforms	Ambili
7	HUN10	Professional Communication	Salini S
8	EST102	Programming In C	Amitha R

S4 ME (2018 Batch)

Sl no	Course code	Subject name	Staff Handled
1	MA202	Probability Distribution Transforms	Mrs. Lijimol
2	ME202	Advanced Mechanics of Solids	Mr. Rantheesh J
3	ME204	Thermal Engineering	Mr. Arun Kumar G
4	ME206	Fluid Machinery	Mr.Vinod Vijayan
5	ME220	Manufacturing Technology	Mr.Yadhu Krishnan
6	HS200	Business Economics	Mrs Geetha Vijayan
7	ME232	Thermal Engineering Lab	Mrs. Arya P Mohan
8	ME230	Fluid Mechanics & Machines Lab	Mr. Vinod Vijayans

S6 ME (2017 Batch)

Sl no	Course code	Subject name	Staff handled
1	ME302	Heat & Mass Tranfer	Dr Krishnakumar K
2	ME304	Dynamics of Machinery	Mr Roshin Thomas
3	ME306	Advanced Manufacturing Technology	Mr Rantheesh J
4	ME308	Computer Aided Design & Analysis	Mrs Arya P Mohan
5	ME312	Metrology and Instrumentation	Mr Vinod Vijayan
6	ME368	Marketing Management (ELE)	Mr Yedu Krishnan
7	ME332	Computer Aided Design & Analysis Lab	Mr Sangeeth S K
8	ME334	Manufacturing Technology Lab II	Mr Sumanlal M S
9	ME352	Comprehensive Exam	Mr Sangeeth S Ks

S8 ME (2016 Batch)

Sl no	Course code	Subject name	Staff handled
1	ME402	Design of Machine Elements II	Mr Sumanlal M S
2	ME404	Industrial Engineering	Mr Sujith S
3	ME476	Material Handling and Facility Planning(ELE)	Mr Arun Kumar Gss
4	ME492	Project	Mr Rantheesh J
5	CE482	Environmental Impact Assessment	Mr.Sony Sethukumar

2019-2020

Odd Semester

COURSE OBJECTIVES AND COURSE OUTCOMES FOR S7

MECHANICAL

ME401: DESIGN OF MACHINE ELEMENTS - I

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To review concepts of statics and strength of materials.	Find out various stresses induced in a machine element under different type of loading conditions.
2	To introduce fundamental approaches to failure prevention of components	Devise machine components for its conceptual design.
3	To provide knowledge in the design of common machine elements such as fasteners, shafts, springs cotter joints and couplings.	

ME403: ADVANCED ENERGY ENGINEERING

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To give an idea about global energy scenario and conventional energy sources	Understand energy scenario and the environmental effects of energy conversion.
2	To understand solar, wind and Biomass energy	Become aware of different renewable energy sources and choose sustainable energy
3	To know concepts of other renewable energy sources	
4	To create awareness on the impacts of energy conversion and importance of sustainable energy	

ME405: REFRIGERATION & AIR-CONDITIONING

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To introduce vapour compression and vapour adsorption systems	Understand the principles refrigeration of air-conditioning and basic design considerations.
2	. To impart knowledge on refrigeration cycles and methods to improve performance	Carry out analysis of refrigeration cycles
3	To familiarize the components of refrigeration systems	Apply the concepts of indoor environmental comfort
4		Perform psychrometric calculations, humidity control and analysis of air-conditioning processes

ME409: MECHATRONICS

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To introduce the features of various sensors used in CNC machines and robots	Know the mechanical systems used in mechatronics
	□ To study the fabrication and functioning of MEMS pressure and inertial sensors	. Integrate mechanical, electronics, control and computer engineering in the design of mechatronics systems
	To enable development of hydraulic/pneumatic circuit and PLC programs for simple	

ME409: COMPRESSIBLE FLUID FLOW

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.	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).
2	To understand the difference between subsonic and supersonic flow	Derive the conditions for the change in pressure, density and temperature for flow through a normal shock
3	To familiarize with high speed test facilities	Determine the strength of oblique shock waves on wedge shaped bodies and concave corners
		Know the various measuring instruments used in compressible flow

ME463: AUTOMOBILE ENGINEERING

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To know the anatomy of automobile in general	Practically identify different automotive systems and subsystems.
2	To understand the working of different automotive systems and subsystems	Understand the principles of transmission, suspension, steering and braking systems of an automobile
3	To update the latest developments in automobiles	Develop a strong base for understanding future developments in the automobile industry

ME431: MECHANICAL ENGINEERING LAB

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To conduct the various heat transfer experiments	Conduct experiments to determine thermal conductivity of materials Determine heat transfer coefficient, LMTD etc..
2	To practice calibration of thermometer and pressure gauges	Do calibration of thermometers and pressure gauges Demonstrate the effect of unbalances resulting from rotary motions
3	To do experiments on dynamics	Visualise the effect of dynamics on vibrations in single and multi degree of freedom system Demonstrate the working principle of governor /gyroscope and demonstrate the effect of forces and moments on their motion

COURSE OBJECTIVES AND COURSE OUTCOMES FOR S5

MECHANICAL

ME 301: MACHANICS 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 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 4	To analyse the motion resulting from a specified set of linkages in a mechanism. To study the power transmission devices.	The students will be able to perform acceleration analysis of mechanism 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 and analyse clutch and brake

EE 311: ELECTRICAL DRIVES & CONTROL FOR AUTOMATION

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 concepts of different types of electrical machines and their Performance	Select a drive for a particular application base on power rating.
2	To know the different methods of starting D.C motors and induction motors.	Select a drive based on mechanical characteris for a particular drive application.
3	To introduce the controllers for automation	Discuss the controllers used for automation
4		

HS 300: PRINCIPLES OF MANAGEMENT COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To develop ability to critically analyse and evaluate a variety of management practices in the contemporary context;	Manage people and organisations
2	To understand and apply a variety of management and organisational theories in practice;	Critically analyse and evaluate management theories and practices
3	To be able to mirror existing practices to generate their own innovative management competencies, required for today's complex and global workplace;	To plan and make decisions for organisations
4	To be able to critically reflect on ethica theories & social responsibility ideologies to create sustainable organisations.	To staffing and related HRD functions

ME 305: COMPUTER PROGRAMMING AND NUMERICAL METHODS

Sl No	Course Objectives	Course Outcomes
1	To equip students with fundamentals of computer programming	The students will be able to write computer programs
2	To provide fundamental idea about the use of computer programming	The students will be able to use numerical solutions for engineering problems
3	To make students to use numerical methods for analyzing the basic engineering problems	To solve application level problems like system of equations and heat equations.

ME303: MACHINE TOOLS & DIGITAL MANUFACTURING 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.

ME 368: 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, equipment 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

ME331: MANUFACTURING TECHNOLOGY 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 slotting 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 cutting forces	Understand the machining operations like grinding and planing

EE335: 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.
3		
4		
5		
6		

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

l. 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.
4		
5		

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 applicationsand 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	**Todetermine 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

MAT 101: LINEAR ALGEBRA AND CALCULUS

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.**
6		

PHT 110: ENGINEERING PHYSICS B

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.**

CYT 100: ENGINEERING CHEMISTRY

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.

EST 100: 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

EST 110: ENGINEERING GRAPHICS

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.

EST 120: BASICS OF CIVIL & MECHANICAL ENGINEERING

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To provide an introduction to the essentials of Civil Engineering discipline	Recall the role of civil engineer in society and to relate the various disciplines of Civil Engineering
2	To provide an insight and inculcate the essentials of Civil Engineering discipline	Explain different types of buildings, building components, building materials and building construction
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.

EST 130: BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING

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.

HUN 101: LIFE SKILLS

PHL 120: ENGINEERING PHYSICS LAB

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**

CYL 120: ENGINEERING CHEMISTRY LAB

ESL 120: CIVIL & 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.**

ESL 130 ELECTRICAL & ELECTRONICS WORKSHOP

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.
6		

2018-2019

Even Semester

COURSE OBJECTIVES AND COURSE OUTCOMES FOR S8

MECHANICAL

ME402: Design of Machine Elements-II

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To provide basic design methods for clutches, brakes, belt drives, bearings, gears and connecting rod.	Apply design procedures for industrial requirements.
2	To introduce the design modifications to be considered for ease of manufacturing	Design machine components to ease the manufacturing limitations

ME404: 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**

ME463: 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		

CE469: ENVIRONMENTAL IMPACT ASSESSMENT

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To know the various types of environmenta	The students will gain basic knowledge of various pollution source impacts
2	To make aware the impact due to various types of pollutants and their assessment technique	

ME452: PROJECT, VIVA-VOCE 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.
3		
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6		

COURSE OBJECTIVES AND COURSE OUTCOMES FOR S6

MECHANICAL

ME312: 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.
4		
5		
6		

ME304: 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.

ME308: 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		

ME302: 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		

ME306: ADVANCED MANUFACTURING TECHNOLOGY

Sl No	Course objectives	Subject Learning Outcomes or Course Outcome On completion of the course, students will be able to:
1	To introduce machining principles and processes in the manufacturing of precision components and products that use conventional and nonconventional technologies.	Become conversant with the non- traditional machining process and to appreciate the effect of process parameters on the surface integrity aspects during the non- traditional machining process.
2	To give basic understanding of the machining capabilities, limitations, and productivity of advanced manufacturing processes.	Appreciate the use of an EDM as a non-traditional method of machining complex and hard materials
3	To describe how PLC's operate and how they control automated equipment and systems	Prescribe a laser materials processing technique suitable for a given product with material, size, precision, and surface quality requirements.
4	To demonstrate tool path simulations with CNC powered equipment	Program and operate a CNC mill and lathe.
5	To introduce CNC programming	Select the tool material and machining

		process parameters.

ME 368: MARKETING MANAGEMENT

Sl No	Course objectives	Subject Learning Outcomes or Course Outcome On completion of the course, students will be able to:
1	To introduce the concept of market and marketing	state the role and functions of marketing within a range of organizations.
2	To give idea about launching a new product	describe key marketing concepts, theories and techniques for analyzing a variety of marketing situations
3	To introduce the various marketing strategies	identify and demonstrate the dynamic nature of the environment in which marketing decisions are taken
4		identify and demonstrate the dynamic nature of the environment in which marketing decisions are taken
5		

ME332: 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.	
3		
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ME 334: MACHINE TOOLS II 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

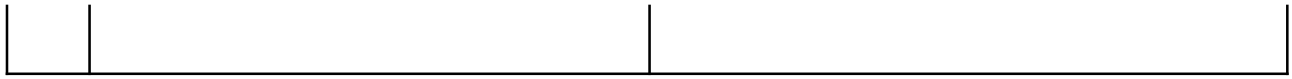
		numerical solutions of nonlinear equations in a single variable.
5		**Be familiar with numerical interpolation and approximation of functions. Be familiar with numerical integration and differentiation**
6		**Be familiar with numerical solution of ordinary differential equations. Be familiar with calculation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



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

l. 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 S2

MECHANICAL

MAT 102: VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORMS

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	Computepartial 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 andproperties 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.**
6		

PHT 110: ENGINEERING PHYSICS B

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.**

CYT 100: ENGINEERING CHEMISTRY

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.

EST 100: 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

EST 110: ENGINEERING GRAPHICS

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.

EST 120: BASICS OF CIVIL & MECHANICAL ENGINEERING

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To provide an introduction to the essentials of Civil Engineering discipline	Recall the role of civil engineer in society and to relate the various disciplines of Civil Engineering
2	To provide an insight and inculcate the essentials of Civil Engineering discipline	Explain different types of buildings, building components, building materials and building construction
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.

EST 130: BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING

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.

EST 102: PROGRAMMING IN C

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To prepare the Engineering Graduates capable of writing readable C programs to solve computational problems that they may have to solve in their professional life	Analyse a computational problem and develop an algorithm/flowchart to find its solution
2	The course content is decided to cover the essential programming fundamentals which can be taught within the given slots in the curriculum.	Develop readable C programs with branching and looping statements, which uses arithmetic, Logical, Relational or Bitwise operators
3	To understand the role of programming in modern engineering problems	Divide a given computational problem into a number of modules and develop a readable multi-function C program by using recursion if required, to find the solution to the computational problem

ESL 120: PROFESSIONAL COMMUNICATION

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To provide the means for an individual to be resourceful and positive while taking on life's vicissitudes.	Define and Identify different life skills required in personal and professional life
2	Development of one's personality by being aware of the self, connecting with others, reflecting on the abstract and the concrete, leading and generating change, and staying rooted in time-tested values and principles is being aimed at.	Develop an awareness of the self and apply well-defined techniques to cope with emotions and stress.
3	To enhance the employability and maximize the potential of the students by introducing them to the principles that underly personal and professional success	Explain the basic mechanics of effective communication and demonstrate these through presentations.
4		Take part in group discussions

PHL 120: ENGINEERING PHYSICS LAB

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/or conference 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**

CYL 120: ENGINEERING CHEMISTRY LAB

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

ESL 120: CIVIL & 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.**

ESL 130 ELECTRICAL & ELECTRONICS WORKSHOP

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.
6		