202041 - Solid Mechanics		
Teaching Scheme	**Credits**	**Examination Scheme**
Theory :04 Hr./Week Practical :02 Hr./Week	**05** Theory : 04 Practical : 01	In-Semester : 30 Marks End-Semester : 70 Marks Practical : 50 Marks

Course Outcomes

On completion of the course, learner will be able to

CO1. **DEFINE** various types of stresses and strain developed on determinate and indeterminate members.

CO2. **DRAW** Shear force and bending moment diagram for various types of transverse loading and support.

CO3. **COMPUTE** the slope & deflection, bending stresses and shear stresses on beam.

CO4. **CALCULATE** torsional shear stress in shaft and buckling on the column.

CO5. **APPLY** the concept of principal stresses and theories of failure to determine stresses on a 2-D element.

CO6. **UTILIZE** the concepts of SFD & BMD, torsion and principal stresses to solve combined loading application based problems.

202042 - Solid Modeling and Drafting		
Teaching Scheme	**Credits**	**Examination Scheme**
Theory : 03 Hr./Week Practical : 02 Hr./Week	**04** Theory : 03 Practical : 01	In-Semester : 30 Marks End-Semester : 70 Marks Practical : 50 Marks

Course Outcomes

On completion of the course, learner will be able to

CO1. UNDERSTAND basic concepts of CAD system, need and scope in Product Lifecycle Management

CO2. UTILIZE knowledge of curves and surfacing features and methods to create complex solid geometry

CO3. CONSTRUCT solid models, assemblies using various modeling techniques & PERFORM mass property analysis, including creating and using a coordinate system

CO4. APPLY geometric transformations to simple 2D geometries

CO5. USE CAD model data for various CAD based engineering applications viz. production drawings, 3D printing, FEA, CFD, MBD, CAE, CAM, etc.

CO6. USE PMI & MBD approach for communication

202043 - Engineering Thermodynamics		
Teaching Scheme	**Credits**	**Examination Scheme**
Theory : 03 Hr./Week Practical : 02 Hr./Week	**04** Theory : 03 Practical : 01	In-Semester : 30 Marks End-Semester : 70 Marks Oral : 25 Marks

Course Outcomes

On completion of the course, learner will be able to

CO1. DESCRIBE the basics of thermodynamics with heat and work interactions.
CO2. APPLY laws of thermodynamics to steady flow and non-flow processes.
CO3. APPLY entropy, available and non available energy for an Open and Closed System,
CO4. DETERMINE the properties of steam and their effect on performance of vapour power cycle.
CO5. ANALYSE the fuel combustion process and products of combustion.
CO6. SELECT various instrumentations required for safe and efficient operation of steam generator.

202044 - Engineering Materials and Metallurgy		
Teaching Scheme	**Credits**	**Examination Scheme**
Theory : 03 Hr./Week Practical : 02 Hr./Week	**04** Theory : 03 Practical : 01	In-Semester : 30 Marks End-Semester : 70 Marks Term Work : 25 Marks

Course Outcomes

On completion of the course, learner will be able to

CO1. COMPARE crystal structures and ASSESS different lattice parameters.
CO2. CORRELATE crystal structures and imperfections in crystals with mechanical behaviour of materials.
CO3. DIFFERENTIATE and DETERMINE mechanical properties using destructive and non-destructive testing of materials.
CO4. IDENTIFY & ESTIMATE different parameters of the system viz., phases, variables, component, grains, grain boundary, and degree of freedom. etc.
CO5. ANALYSE effect of alloying element & heat treatment on properties of ferrous & nonferrous alloy.
CO6. SELECT appropriate materials for various applications.

203156 - Electrical and Electronics Engineering		
Teaching Scheme	**Credits**	**Examination Scheme**
Theory : 03 Hr./Week Practical : 02 Hr./Week	**04** Theory : 03 Practical : 01	In-Semester : 30 Marks End-Semester : 70 Marks Term Work : 25 Marks

Course Outcomes

On completion of the course, learner will be able to

CO1. APPLY programming concepts to UNDERSTAND role of Microprocessor and Microcontroller in embedded systems

CO2. DEVELOP interfacing of different types of sensors and other hardware devices with Atmega328 based Arduino Board

CO3. UNDERSTAND the operation of DC motor, its speed control methods and braking

CO4. DISTINGUISH between types of three phase induction motor and its characteristic features

CO5. EXPLAIN about emerging technology of Electric Vehicle (EV) and its modular subsystems

CO6. CHOOSE energy storage devices and electrical drives for EVs

202045 - Geometric Dimensioning and Tolerancing Lab		
Teaching Scheme	**Credits**	**Examination Scheme**
Practical : 02 Hr./Week	**01** Practical : 01	Term Work : 25 Marks

Course Outcomes

On completion of the course, learner will be able to

CO1. SELECT appropriate IS and ASME standards for drawing

CO2. READ & ANALYSE variety of industrial drawings

CO3. APPLY geometric and dimensional tolerance, surface finish symbols in drawing

CO4. EVALUATE dimensional tolerance based on type of fit, etc.

CO5. SELECT an appropriate manufacturing process using DFM, DFA, etc.

207002 - Engineering Mathematics - III		
Teaching Scheme	**Credits**	**Examination Scheme**
Theory : 03 Hr./Week Tutorial : 01Hr/Week	**04** Theory : 03 Practical : 01	In-Semester : 30 Marks End-Semester : 70 Marks Term Work : 25 Marks

Course Outcomes

On completion of the course, learner will be able to

CO1. SOLVE higher order linear differential equations and its applications to model and analyze mass spring systems.

CO2. APPLY Integral transform techniques such as Laplace transform and Fourier transform to solve differential equations involved in vibration theory, heat transfer and related mechanical engineering applications.

CO3. APPLY Statistical methods like correlation, regression in analyzing and interpreting experimental data applicable to reliability engineering and probability theory in testing and quality control.

CO4. PERFORM Vector differentiation & integration, analyze the vector fields and APPLY to fluid flow problems.

CO5. SOLVE Partial differential equations such as wave equation, one and two dimensional heat flow equations.

202047 - Kinematics of Machinery		
Teaching Scheme	**Credits**	**Examination Scheme**
Theory : 03 Hr./Week Practical : 02 Hr./Week	**04** Theory : 03 Practical : 01	In-Semester : 30 Marks End-Semester : 70 Marks Oral : 25 Marks

Course Outcomes

On completion of the course, learner will be able to

CO1. APPLY kinematic analysis to simple mechanisms

CO2. ANALYZE velocity and acceleration in mechanisms by vector and graphical method

CO3. SYNTHESIZE a four bar mechanism with analytical and graphical methods

CO4. APPLY fundamentals of gear theory as a prerequisite for gear design

CO5. CONSTRUCT cam profile for given follower motion

202048 - Applied Thermodynamics		
Teaching Scheme	**Credits**	**Examination Scheme**
Theory : 03 Hr./Week Practical : 02 Hr./Week	**04** Theory : 03 Practical : 01	In-Semester : 30 Marks End-Semester : 70 Marks Oral : 25 Marks

Course Outcomes

On completion of the course, learner will be able to

CO1. DETERMINE COP of refrigeration system and ANALYZE psychrometric processes.
CO2. DISCUSS basics of engine terminology,air standard, fuel air and actual cycles.
CO3. IDENTIFY factors affecting the combustion performance of SI and CI engines.
CO4. DETERMINE performance parameters of IC Engines and emission control.
CO5. EXPLAIN working of various IC Engine systems and use of alternative fuels.
CO6. CALCULATE performance of single and multi stage reciprocating compressors and DISCUSS rotary positive displacement compressors

202049 - Fluid Mechanics		
Teaching Scheme	**Credits**	**Examination Scheme**
Theory : 03 Hr./Week Practical : 02 Hr./Week	**04** Theory : 03 Practical : 01	In-Semester : 30 Marks End-Semester : 70 Marks Oral : 25 Marks

Course Outcomes

On completion of the course, learner will be able to

CO1. DETERMINE various properties of fluid
CO2. APPLY the laws of fluid statics and concepts of buoyancy
CO3. IDENTIFY types of fluid flow and terms associated in fluid kinematics
CO4. APPLY principles of fluid dynamics to laminar flow
CO5. ESTIMATE friction and minor losses in internal flows and DETERMINE boundary layer formation over an external surface
CO6. CONSTRUCT mathematical correlation considering dimensionless parameters, also ABLEto predict the performance of prototype using model laws

202050 - Manufacturing Processes		
Teaching Scheme	**Credits**	**Examination Scheme**
Theory : 03 Hr./Week	**03** Theory : 03	In-Semester : 30 Marks End-Semester : 70 Marks

Course Outcomes

On completion of the course, learner will be able to

CO1. SELECT appropriate moulding, core making and melting practice and estimate pouring time, solidification rate and DESIGN riser size and location for sand casting process

CO2. UNDERSTAND mechanism of metal forming techniques and CALCULATE load required for flat rolling

CO3. DEMONSTRATE press working operations and APPLY the basic principles to DESIGN dies and tools for forming and shearing operations

CO4. CLASSIFY and EXPLAIN different welding processes and EVALUATE welding characteristics

CO5. DIFFERENTIATE thermoplastics and thermosetting and EXPLAIN polymer processing techniques

CO6. UNDERSTAND the principle of manufacturing of fibre-reinforce composites and metalmatrix composites

202051 - Machine Shop		
Teaching Scheme	**Credits**	**Examination Scheme**
Practical : 02 Hr./Week	**01** Practical : 01	In-Semester : 30 Marks End-Semester : 70 Marks Term Work : 50 Marks

Course Outcomes

On completion of the course, learner will be able to

CO1. PERFORM welding using TIG/ MIG/ Resistance/Gas welding technique

CO2. MAKE Fibre-reinforced Composites by hand lay-up process or spray lay-up techniques

CO3. PERFORM cylindrical/surface grinding operation and CALCULATE its machining time

CO4. DETERMINE number of indexing movements required and acquire skills to PRODUCE a spur gear on a horizontal milling machine

CO5. PREPARE industry visit report

CO6. UNDERSTAND procedure of plastic processing

202052 - Project Based Learning - II		
Teaching Scheme	**Credits**	**Examination Scheme**
Practical : 04 Hr./Week	**02** Practical : 02	Term Work : 50 Marks

Course Outcomes

On completion of the course, learner will be able to

CO1. IDENTIFY the real-world problem (possibly of interdisciplinary nature) through a rigorousliterature survey and formulate / set relevant aims and objectives.

CO2. ANALYZE the results and arrive at valid conclusions.

CO3. PROPOSE a suitable solution based on the fundamentals of mechanical engineering by possibly integration of previously acquired knowledge.

CO4. CONTRIBUTE to society through proposed solutions by strictly following professional ethics and safety measures.

CO5. USE of technology in proposed work and demonstrate learning in oral and written form.CO6. DEVELOP ability to work as an individual and as a team member.