



## 18\_CO\_FIRST YEAR\_SYLLABUS

21MAT11- CALCULUS AND LINEAR ALGEBRA	
CO1	Apply the knowledge of calculus to solve problems related to polar curves and its applications in determining the bentness of a curve
CO2	Learn the notion of partial differentiation to calculate rates of change of multivariate functions and solve problems related to composite functions and Jacobians.
CO3	Apply the concept of change of order of integration and variables to evaluate multiple integrals and their usage in computing the area and volumes.
CO4	Solve first order linear/nonlinear differential equation analytically using standard methods.
CO5	Make use of matrix theory for solving system of linear equations and compute eigen values and eigenvectors required for matrix diagonalization process.

18PHY12/22- ENGINEERING PHYSICS	
CO1	Understand various types of oscillations and their implications, the role of Shock waves in various fields and Recognize the elastic properties of materials for engineering applications.
CO2	Realize the interrelation between time varying electric field and magnetic field, the transverse nature of the EM waves and their role in optical fiber communication.
CO3	Compute Eigen values, Eigen functions, momentum of Atomic and subatomic particles using Time independent 1-D Schrodinger's wave equation.
CO4	Apprehend theoretical background of lase construction and working of different types of laser and its applications in different fields.
CO5	Understand various electrical and thermal properties of materials like conductors, semiconductors and dielectrics using different theoretical models.

18ELE13/23-BASIC ELECTRICAL ENGINEERING	
CO1	Analyze D.C and A.C circuits.
CO2	Explain the principle of operation and construction of single phase transformers.
CO3	Explain the principle of operation and construction of DC machines and synchronous machines.
CO4	Explain the principle of operation and construction of three phase induction motors.
CO5	Discuss concepts of electrical wiring, circuit protecting devices and earthing.



<b>18CIV14/24-CIVIL ENGINEERING AND MECHANICS</b>	
<b>CO1</b>	Mention the applications of various fields of Civil Engineering.
<b>CO2</b>	Compute the resultant of given force system subjected to various loads.
<b>CO3</b>	Comprehend the action of Forces, Moments and other loads on systems of rigid bodies and compute the reactive forces that develop as a result of the external loads.
<b>CO4</b>	Locate the Centroid and compute the Moment of Inertia of regular and built-up sections.
<b>CO5</b>	Express the relationship between the motion of bodies and analyse the bodies in motion.

<b>18EGDL15/25- ENGINEERING GRAPHICS</b>	
<b>CO1</b>	Prepare engineering drawings as per BIS conventions mentioned in the relevant codes.
<b>CO2</b>	Produce computer generated drawings using CAD software.
<b>CO3</b>	Use the knowledge of orthographic projections to represent engineering information/concepts and present the same in the form of drawings.
<b>CO4</b>	Develop isometric drawings of simple objects reading the orthographic projections of those objects.
<b>CO5</b>	Convert pictorial and isometric views of simple objects to orthographic views.

<b>18PHYL16/26-ENGINEERING PHYSICS LABORATORY</b>	
<b>CO1</b>	Apprehend the concepts of interference of light, diffraction of light, Fermi energy and magnetic effect of current.
<b>CO2</b>	Understand the principles of operations of optical fibers semiconductor devices such as Photodiode, and NPN transistor unsigned simple circuits.
<b>CO3</b>	Determine elastic moduli and moment of inertia of given materials with the help of suggested procedures.
<b>CO4</b>	Recognize the resonance concept and its practical applications.
<b>CO5</b>	Understand the importance of measurement procedure, honest recording and representing the data, reproduction of final results.

<b>18ELEL17/27- BASIC ELECTRICAL ENGINEERING LABORATORY</b>	
<b>CO1</b>	Identify the common electrical components and measuring instruments used for conducting experiments in the electrical laboratory.
<b>CO2</b>	Compare power factor of lamps.
<b>CO3</b>	Determine impedance of an electrical circuit and power consumed in a 3phase load.
<b>CO4</b>	Determine earth resistance and understand two Way and three way control of lamps.



<b>18EGH18- TECHNICAL ENGLISH-I</b>	
CO1	Use grammatical English and essentials of language skills and identify the nuances of phonetics, intonation and flawless pronunciation.
CO2	Implement English vocabulary at command and language proficiency.
CO3	Identify common errors in spoken and written communication.
CO4	Understand and improve the non-verbal communication and kinesics.
CO5	Perform well in campus recruitment, engineering and all other general competitive examinations.

<b>18MAT21- ADVANCED CALCULUS AND NUMERICAL METHODS</b>	
CO1	Illustrate the applications of multivariate calculus to understand the solenoidal and irrotational vectors and also exhibit the inter dependence of line, surface and volume integrals.
CO2	Demonstrate various physical models through higher order differential equations and solve such linear ordinary differential equations.
CO3	Construct a variety of partial differential equations and solution by exact methods/method of separation of variables.
CO4	Explain the applications of infinite series and obtain series solution of ordinary differential equations.
CO5	Apply the knowledge of numerical methods in the modeling of various physical and engineering phenomena.

<b>18CHE12/22- ENGINEERING CHEMISTRY</b>	
CO1	Use of free energy in equilibria, rationalize bulk properties and processes using thermodynamic considerations, electrochemical energy systems.
CO2	Causes & effects of corrosion of metals and control of corrosion. Modification of surface properties of metals to develop resistance to corrosion, wear, tear, impact etc. by electroplating and electroless plating.
CO3	Production & consumption of energy for industrialization of country and living standards of people. Electrochemical and concentration cells. Classical, modern batteries and fuel cells. Utilization of solar energy for different useful forms of energy.
CO4	Environmental pollution, waste management and water chemistry.
CO5	Different techniques of instrumental methods of analysis. Fundamental principles of nano materials.

<b>18CPS13/23- C PROGRAMMING FOR PROBLEM SOLVING</b>	
CO1	Illustrate simple algorithms mathematics, physics, etc.
CO2	Construct a programming solution to the given problem using C.
CO3	Identify and correct the syntax and logical errors in C programs.
CO4	Modularize the given problem using functions and structures.



<b>18ELN14/24- BASICELECTRONICS</b>	
<b>CO1</b>	Describe the operation of diodes, BJT, FET and Operational Amplifiers.
<b>CO2</b>	Design and explain the construction of rectifiers, regulators, amplifiers and oscillators.
<b>CO3</b>	Describe general operating principles of SCRs and its application.
<b>CO4</b>	Explain the working and design of Fixed voltage IC regulator using 7805 and A stable oscillator using Timer IC 555.
<b>CO5</b>	Explain the different number system and their conversions and construct simple combinational and sequential logic circuits using Flip-Flops.
<b>CO6</b>	Describe the basic principle of operation of communication system and mobile phones.

<b>18EME15/25- ELEMENTS OF MECHANICAL ENGINEERING</b>	
<b>CO1</b>	Identify different sources of energy and their conversion process
<b>CO2</b>	Explain the working principle of hydraulic turbines, pumps, IC engines and refrigeration.
<b>CO3</b>	Recognize various metal joining processes and power transmission elements.
<b>CO4</b>	Understand the properties of common engineering materials and their applications in engineering industry.
<b>CO5</b>	Discuss the working of conventional machine tools, machining processes, tools and accessories.
<b>CO6</b>	Describe the advanced manufacturing systems.

<b>18CHEL16/26- ENGINEERING CHEMISTRY LABORATORY</b>	
<b>CO1</b>	Handling different types of instruments for analysis of materials using small quantities of materials involved for quick and accurate results.
<b>CO2</b>	Carrying out different types of titrations for estimation of concerned in materials using comparatively more quantities of materials involved for good results.

<b>18CPL17/27- CPROGRAMMINGLABORATORY</b>	
<b>CO1</b>	Write algorithms, flowcharts and program for simple problems.
<b>CO2</b>	Correct syntax and logical errors to execute a program.
<b>CO3</b>	Write iterative and wherever possible recursive programs.
<b>CO4</b>	Demonstrate use of functions arrays, strings, structures and pointers in problem solving



<b>18EGH28- TECHNICAL ENGLISH-II</b>	
<b>CO1</b>	Identify common errors in spoken and written communication.
<b>CO2</b>	Get familiarized with English vocabulary and language proficiency.
<b>CO3</b>	Improve nature and style of sensible writing and acquire employment and workplace communication skills.
<b>CO4</b>	Improve their Technical Communication SEIs through Technical Reading and Writing practices.
<b>CO5</b>	Perform well in campus recruitment, engineering and all other general competitive examinations.



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## 21\_CO\_FIRST YEAR\_SYLLABUS

<b>21MAT11- CALCULUS AND DIFFERENTIAL EQUATIONS</b>	
CO1	Apply the knowledge of calculus to solve problems related to polar curves and its applications in determining the bentness of a curve.
CO2	Learn the notion of partial differentiation to calculate rate of change of multivariate functions and solve problems related to composite functions and Jacobian.
CO3	Solve first-order linear/nonlinear ordinary differential equations analytically using standard methods.
CO4	Demonstrate various models through higher order differential equations and solve such linear ordinary differential equations.
CO5	Test the consistency of a system of linear equations and to solve them by direct and iterative methods.

  

<b>21PHY12/22- ENGINEERING PHYSICS</b>	
CO1	Interpret the types of Mechanical vibrations and their applications, the role of shock waves in various fields
CO2	Demonstrate the quantization of energy for microscopic system
CO3	Apply Laser and Optical fibers in opto electronic system.
CO4	Illustrate merits of quantum free electronic theory and applications of Hall effect
CO5	Analyse the important of XRD and Electron Microscopy in Nano Material characterization.

  

<b>21ELE13/23-BASIC ELECTRICAL ENGINEERING</b>	
CO1	Analyze basic DC and AC electric circuits.
CO2	Explain the working principles of transformers and electrical machines.
CO3	Explain the concepts of electric power transmission and distribution of power.
CO4	Understand the wiring methods, electricity billing, and working principles of circuit protective devices and personal safety measures.

  

<b>21CIV14/24-ELEMENTS OF CIVIL ENGINEERING AND MECHANICS</b>	
CO1	Understand the various fields of civil engineering.
CO2	Compute the resultant of a force system and resolution of a force
CO3	Comprehend the action for forces, moments, and other types of loads on rigid bodies and compute the reactive forces.
CO4	Locate the centroid and compute the moment of inertia of regular and built-up sections.
CO5	Analyze the bodies in motion.



<b>21EVNL15/25- Engineering Visualization</b>	
<b>CO1</b>	Prepare and understand engineering drawings.
<b>CO2</b>	Identify and apply the principles of orthographic projections of lines, planes and solids.
<b>CO3</b>	Identify and apply the principles of orthographic projections and prepare development of lateral surfaces.
<b>CO4</b>	Visualize three dimensional objects and develop isometric projections.
<b>CO5</b>	Visualize engineering components.

<b>21PHYL16/26-ENGINEERING PHYSICS LABORATORY</b>	
<b>CO1</b>	Understand the measuring techniques
<b>CO2</b>	Operate different instruments and be capable to analyze the experimental results.
<b>CO3</b>	Construct the circuits and their analysis.

<b>21EEL17/27- BASIC ELECTRICAL ENGINEERING LABORATORY</b>	
<b>CO1</b>	Verify KCL and KVL and maximum power transfer theorem for DC circuits. Compare power factors of different types of lamps.
<b>CO2</b>	Compare power factors of different types of lamps.
<b>CO3</b>	Demonstrate the measurement of the impedance of an electrical circuit and power consumed by a 3-phase load.
<b>CO4</b>	Analyze two-way and three-way control of lamps.
<b>CO5</b>	Explain the effects of open and short circuits in simple circuits.
<b>CO6</b>	Interpret the suitability of earth resistance measured.

<b>21EGH18- Communicative English</b>	
<b>CO1</b>	Understand and apply the Fundamentals of Communication Skills in their communication skills.
<b>CO2</b>	Identify the nuances of phonetics, intonation and enhance pronunciation skills.
<b>CO3</b>	To impart basic English grammar and essentials of language skills as per present requirement.
<b>CO4</b>	Understand and use all types of English vocabulary and language proficiency.
<b>CO5</b>	Adopt the Techniques of Information Transfer through presentation.



<b>21IDT19/29- INNOVATION AND DESIGN THINKING</b>	
<b>CO1</b>	Appreciate various design process procedure
<b>CO2</b>	Generate and develop design ideas through different technique
<b>CO3</b>	Identify the significance of reverse Engineering to Understand products
<b>CO4</b>	Draw technical drawing for design ideas

<b>21MAT21- ADVANCED CALCULUS AND NUMERICAL METHODS</b>	
<b>CO1</b>	Apply the concept of change of order of integration and change of variables to evaluate multiple integrals and their usage in computing the area and volume.
<b>CO2</b>	Illustrate the applications of multivariate calculus to understand the solenoidal and irrotational vectors and also exhibit the interdependence of line, surface, and volume integrals
<b>CO3</b>	Formulate physical problems to partial differential equations and to obtain solutions for standard practical PDE's.
<b>CO4</b>	Apply the knowledge of numerical methods in modeling various physical and engineering phenomena.
<b>CO5</b>	Solve first-order ordinary differential equations arising in engineering problems

<b>21CHE12/22- ENGINEERING CHEMISTRY</b>	
<b>CO1</b>	Discuss the electrochemical energy systems such as electrodes and batteries
<b>CO2</b>	Explain the fundamental concepts of corrosion, its control and surface modification methods namely electroplating and electro less plating
<b>CO3</b>	Enumerate the importance, synthesis and applications of polymers Understand Properties and application of nonmaterial
<b>CO4</b>	Describes the principles of green chemistry, understand properties and application alternative fuels
<b>CO5</b>	Illustrate the fundamental principles of water chemistry, applications of volumetric and analytical instrumentation

<b>21PSP13/23- PROBLEM-SOLVING THROUGH PROGRAMMING</b>	
<b>CO1</b>	Elucidate the basic architecture and functionalities of a computer and also recognize the hardware parts.
<b>CO2</b>	Apply programming constructs of C language to solve the real world problem
<b>CO3</b>	Explore user-defined data structures like arrays in implementing solutions to problems like searching and sorting
<b>CO4</b>	Explore user-defined data structures like structures, unions and pointers in implementing solutions
<b>CO5</b>	Design and Develop Solutions to problems using modular programming constructs using functions



<b>21ELN14/24- BASIC ELECTRONICS &amp; COMMUNICATION ENGINEERING</b>	
<b>CO1</b>	Describe the concepts of electronic circuits encompassing power supplies, amplifiers and oscillators.
<b>CO2</b>	Present the basics of digital logic engineering including data representation, circuits and the microcontroller system with associated sensors and actuators.
<b>CO3</b>	Discuss the characteristics and technological advances of embedded systems.
<b>CO4</b>	Relate to the fundamentals of communication engineering spanning from the frequency spectrum to the various circuits involved including antennas.
<b>CO5</b>	Explain the different modes of communications from wired to wireless and the computing involved

<b>21EME15/25- ELEMENTS OF MECHANICAL ENGINEERING</b>	
<b>CO1</b>	Understand basic concepts of mechanical engineering in the fields of energy and its utilization, materials technology, manufacturing techniques, and transmission systems through demonstrations.
<b>CO2</b>	Understand the application of energy sources in Power generation and utilization, Engineering materials, manufacturing, and machining techniques leading to the latest advancements and transmission systems in day to day activities
<b>CO3</b>	Apply the skills in developing simple mechanical elements and processes

<b>21CHEL16/26- ENGINEERING CHEMISTRY LABORATORY</b>	
<b>CO1</b>	Determine the pKa and coefficient of Viscosity of a given organic liquid
<b>CO2</b>	Estimate The Amount Of Substance Present In The Given Solution Using Potentiometer Conduct metric And Colorimetric.
<b>CO3</b>	Determine the total hardness and chemical oxygen demand in the given solution by volumetric analysis method
<b>CO4</b>	Estimate the percentage of Nickel, copper and Iron in the given analyze solution by volumetric analysis method
<b>CO5</b>	Demonstrate flame photometric estimation of sodium & potassium and the synthesis of nonmetals by Precipitation method.

<b>21CPL17/27- COMPUTER PROGRAMMING LABORATORY</b>	
<b>CO1</b>	Define the problem statement and identify the need for computer programming
<b>CO2</b>	Make use of C compiler, IDE for programming, identify and correct the syntax and syntactic errors in programming
<b>CO3</b>	Develop algorithm, flowchart and write programs to solve the given problem
<b>CO4</b>	Demonstrate use of functions, recursive functions, arrays, strings, structures and pointers in problem solving.
<b>CO5</b>	Document the inference and observations made from the implementation



<b>21EGH28- PROFESSIONAL WRITING SKILLS IN ENGLISH</b>	
<b>CO1</b>	To understand and identify the Common Errors in Writing and Speaking.
<b>CO2</b>	To Achieve better Technical writing and Presentation skills.
<b>CO3</b>	To read Technical proposals properly and make them to Write good technical reports.
<b>CO4</b>	Acquire Employment and Workplace communication skills.
<b>CO5</b>	To learn about Techniques of Information Transfer through presentation in different level.

<b>21SFH19/29- SCIENTIFIC FOUNDATIONS OF HEALTH</b>	
<b>CO1</b>	To understand Health and wellness (and its Beliefs)
<b>CO2</b>	To acquire Good Health & It's balance for positive mindset
<b>CO3</b>	To inculcate and develop the healthy lifestyle habits for good health
<b>CO4</b>	To Create of Healthy and caring relationships to meet the requirements of MNC and LPG world
<b>CO5</b>	To adopt the innovative & positive methods to avoid risks from harmful habits in their campus & outside the campus.
<b>CO6</b>	To positively fight against harmful diseases for good health through positive mindset.



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**DEPARTMENT OF MECHANICAL ENGINEERING**

**2018 SCHEME**

**SUBJECT: TRANSFORM CALCULUS, FOURIER SERIES AND NUMERICAL TECHNIQUES**

**SUBJECT CODE: 18MAT31**

CO#	Course Outcomes
CO : 1	Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering
CO : 2	Demonstrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory
CO : 3	Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems.
CO : 4	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods.
CO : 5	Determine the extremals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.

**SUBJECT: MECHANICS OF MATERIALS**

**SUBJECT CODE: 18ME32**

CO#	Course Outcomes
CO : 1	Understand simple, compound, thermal stresses and strains their relations and strain energy.
CO : 2	Analyse structural members for stresses, strains and deformations..
CO : 3	Analyse the structural members subjected to bending and shear loads.
CO : 4	Analyse shafts subjected to twisting loads.
CO : 5	Analyse the short columns for stability



**SUBJECT: BAISC THERMODYNAMICS****SUBJECT CODE: 18ME33**

CO#	Course Outcomes
CO : 1	Explain fundamentals of thermodynamics and evaluate energy interactions across the boundary of thermodynamic systems.
CO : 2	Evaluate the feasibility of cyclic and non-cyclic processes using 2nd law of thermodynamics.
CO : 3	Apply the knowledge of entropy, reversibility and irreversibility to solve numerical problems and apply 1st law of thermodynamics to closed and open systems and determine quantity of energy transfers and change in properties
CO : 4	Interpret the behavior of pure substances and its application in practical problems
CO : 5	Recognize differences between ideal and real gases and evaluate thermodynamic properties of ideal and real gas mixtures using various relations.

**SUBJECT: MATERIAL SCIENCE****SUBJECT CODE: 18ME34**

CO#	Course Outcomes
CO : 1	Understand the mechanical properties of metals and their alloys various materials available and material selection procedures.
CO : 2	Analyze the various modes of failure and understand the microstructures of ferrous and nonferrous materials.
CO : 3	Describe the processes of heat treatment of various alloys.
CO : 4	Acquire the Knowledge of composite materials and their production process as well as applications.
CO : 5	Understand the properties and potentialities of various materials available and material selection procedures.

**SUBJECT: METAL CUTTING AND FORMING****SUBJECT CODE: 18ME35A/45A**

CO#	Course Outcomes
CO : 1	Explain the construction & specification of various machine tools.
CO : 2	Discuss different cutting tool materials, tool nomenclature & surface finish.
CO : 3	Apply mechanics of machining process to evaluate machining time.
CO : 4	Analyze tool wear mechanisms and equations to enhance tool life and minimize machining cost
CO : 5	Understand the concepts of different metal forming processes.
CO : 6	Apply the concepts of design of sheet metal dies to design different dies for simple sheet metal components.



CO#	Course Outcomes
CO : 1	Describe the casting process and prepare different types of cast products.
CO : 2	Acquire knowledge on Pattern, Core, Gating, Riser system and to use Jolt, Squeeze, Sand Slinger moulding machines.
CO : 3	Compare the Gas fired pit, Resistance, Coreless, Electrical and Cupola Metal Furnaces
CO : 4	Compare the Gravity, Pressure die, Centrifugal, Squeeze, slush and Continuous Metal mold castings.
CO : 5	Understand the Solidification process and Casting of Non-Ferrous Metals
CO: 6	Describe the Metal Arc, TIG, MIG, Submerged and Atomic Hydrogen Welding processes etc. used in manufacturing. CO7: Describe methods for the quality assurance of components made of casting and joining process
CO:7	Describe methods for the quality assurance of components made of casting and joining process

CO#	Course Outcomes
CO : 1	Identify the national and international standards pertaining to machine drawing.
CO : 2	Understand the importance of the linking functional and visualization aspects in the preparation of the part drawings
CO : 3	Apply limits and tolerances to assemblies and choose appropriate fits for given assemblies.
CO : 4	Interpret the Machining and surface finish symbols on the component drawings.
CO : 5	Preparation of the part or assembly drawings as per the conventions.

CO#	Course Outcomes
CO : 1	Understand the objectives of metrology, methods of measurement, standards of measurement & various measurement parameters.
CO : 2	Explain tolerance, limits of size, fits, geometric and position tolerances, gauges and their design
CO : 3	Understand the working principle of different types of comparators. CO3: Describe measurement of major & minor diameter, pitch, angle and effective diameter of screw threads
CO : 4	Explain measurement systems, transducers, intermediate modifying devices and terminating devices
CO : 5	Describe functioning of force, torque, pressure, strain and temperature measuring devices.



**SUBJECT: MATERIAL TESTING LAB****SUBJECT CODE: 18ME37A/47A**

CO#	Course Outcomes
CO : 1	Acquire experimentation skills in the field of material testing
CO : 2	Develop theoretical understanding of the mechanical properties of materials by performing experiments.
CO : 3	Apply the knowledge to analyse a material failure and determine the failure inducing agent/s.
CO : 4	Apply the knowledge of testing methods in related areas..
CO : 5	Understand how to improve structure/behaviour of materials for various industrial applications

**SUBJECT: MECHANICAL MEASUREMENTS AND METROLOGY LAB SUBJECT CODE: 18ME37B/47B**

CO#	Course Outcomes
CO : 1	Understand Calibration of pressure gauge, thermocouple, LVDT, load cell, micrometre.
CO : 2	Apply concepts of Measurement of angle using Sine Centre/ Sine Bar/ Bevel Protractor, alignment using Autocollimator/ Roller set
CO : 3	Demonstrate measurements using Optical Projector/Tool maker microscope, Optical flats
CO : 4	Analyse tool forces using Lathe/Drill tool dynamometer.
CO : 5	Analyse Screw thread parameters using 2-Wire or 3-Wire method, gear tooth profile using gear tooth Vernier/Gear tooth micrometre
CO : 3	Understand the concepts of measurement of surface roughness.

**SUBJECT: WORKSHOP AND MACHINE SHOP PRACTICE****SUBJECT CODE: 18ME38A/48A**

CO#	Course Outcomes
CO : 1	To read working drawings, understand operational symbols and execute machining operations.
CO : 2	Prepare fitting models according to drawings using hand tools- V-block, marking gauge, files, hack saw, drills etc
CO : 3	Understand integral parts of lathe, shaping and milling machines and various accessories and attachments used.
CO : 4	Select cutting parameters like cutting speed, feed, depth of cut, and tooling for various machining operations.
CO : 5	Perform cylindrical turning operations such as plain turning, taper turning, step turning, thread Cutting, facing, knurling, internal thread cutting, eccentric turning and estimate cutting time.
CO : 6	Perform machining operations such as plain shaping, inclined shaping, keyway cutting, Indexing and Gear cutting and estimate cutting time. Conduct



**SUBJECT: FOUNDRY, FORGING AND WELDING LAB****SUBJECT CODE: 18MEL38B/48B**

CO#	Course Outcomes
CO : 1	Demonstrate various skills in preparation of molding sand for conducting tensile, shear and compression tests using Universal sand testing machine
CO : 2	Demonstrate skills in determining permeability, clay content and Grain Fineness Number of base sands.
CO : 3	Demonstrate skills in preparation of forging models involving upsetting, drawing and bending operations

**SUBJECT: CONSTITUTION OF INDIA, PROFESSIONAL ETHICS AND CYBER LAW (CPC) SUBJECT CODE: 18CPC39/49**

CO#	Course Outcomes
CO : 1	Have constitutional knowledge and legal literacy.
CO : 2	Understand Engineering and Professional ethics and responsibilities of Engineers. □
CO : 3	Understand the the cybercrimes and cyber laws for cyber safety measures. Question

**SUBJECT: COMPLEX ANALYSIS, PROBABILITY AND STATISTICAL METHODS  
SUBJECT CODE: 18MAT41**

CO#	Course Outcomes
CO : 1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.
CO : 2	Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing.
CO : 3	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field
CO : 4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
CO : 5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.

**SUBJECT: APPLIED THERMODYNAMICS****SUBJECT CODE: 18ME42**

CO#	Course Outcomes
CO : 1	Apply thermodynamic concepts to analyze the performance of gas power cycles.
CO : 2	Apply thermodynamic concepts to analyze the performance of vapour power cycles.
CO : 3	Understand combustion of fuels and performance of I C engines.
CO : 4	Understand the principles and applications of refrigeration systems.



CO : 5	Apply Thermodynamic concepts to determine performance parameters of refrigeration and airconditioning systems.
CO : 6	Understand the working principle of Air compressors and Steam nozzles, applications, relevance of air and identify methods for performance improvement

**SUBJECT: FLUID MECHANICS**

**SUBJECT CODE: 18ME43**

CO#	Course Outcomes
CO : 1	Identify and calculate the key fluid properties used in the analysis of fluid behavior.
CO : 2	Explain the principles of pressure, buoyancy and floatation
CO : 3	Apply the knowledge of fluid statics, kinematics and dynamics while addressing problems of mechanical and chemical engineering.
CO : 4	Describe the principles of fluid kinematics and dynamics.
CO : 5	Explain the concept of boundary layer in fluid flow and apply dimensional analysis to form dimensionless numbers in terms of input output variables.
CO : 6	Illustrate and explain the basic concept of compressible flow and CFD

**SUBJECT: KINEMATICS OF MACHINES**

**SUBJECT CODE: 18ME44**

CO#	Course Outcomes
CO : 1	Knowledge of mechanisms and their motion.
CO : 2	Understand the inversions of four bar mechanisms.
CO : 3	Analyse the velocity, acceleration of links and joints of mechanisms.
CO : 4	Analysis of cam follower motion for the motion specifications.
CO : 5	Understand the working of the spur gears.
CO : 6	Analyse the gear trains speed ratio and torque.

**SUBJECT: METAL CUTTING AND FORMING**

**SUBJECT CODE: 18ME35A/45A**

CO#	Course Outcomes
CO : 1	Explain the construction & specification of various machine tools.
CO : 2	Discuss different cutting tool materials, tool nomenclature & surface finish.
CO : 3	Apply mechanics of machining process to evaluate machining time.
CO : 4	Analyze tool wear mechanisms and equations to enhance tool life and minimize machining cost.



CO : 5	Understand the concepts of different metal forming processes
CO : 6	Apply the concepts of design of sheet metal dies to design different dies for simple sheet metal components.