



SOLAPUR UNIVERSITY, SOLAPUR
FACULTY OF ENGINEERING & TECHNOLOGY
Mechanical Engineering

Programme Educational Objectives and Outcomes

Program Educational Objectives

The Program Educational Objectives for Mechanical Engineering program are designed to produce competent mechanical engineers who are ready to contribute effectively to the advancement of Mechanical Engineering and to fulfil the needs of the community. These objectives are as follows:

1. Graduates will be prepared with strong engineering fundamentals leading to excellent performance in professional career in mechanical engineering to produce various mechanical systems that meet the societal needs.
2. Graduates will be enabled to innovate, design and develop various Mechanical Engineering and allied systems using modern engineering skills, techniques and tools.
3. Graduates will exhibit excellent interpersonal communication and resource-management skills as leaders while working as a part of multidisciplinary team.
4. Graduates will be prepared with sound foundation in mathematics, science and in Mechanical Engineering to prepare them for higher studies and research.
5. Graduates will possess a breadth of knowledge and engage themselves in the life-long learning to meet challenges of globalisation.
6. Graduates will be sensitive towards ethical, societal and environmental issues while accomplishing their professional work.



Program Outcomes

Students attain the following outcomes:

- a. an ability to apply knowledge of mathematics, science, and engineering
- b. an ability to design and conduct experiments, as well as to analyze and interpret data,
- c. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- d. an ability to function on multidisciplinary teams
- e. an ability to identify, formulate, and solve engineering problems
- f. an understanding of professional and ethical responsibility
- g. an ability to communicate effectively
- h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- i. a recognition of the need for, and an ability to engage in life-long learning,
- j. a knowledge of contemporary issues
- k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.



Program Specific Outcomes (PSOs)

1. Graduate will be able to design and develop mechanical equipments, devices and contrivances that would be able serve the society in a sustainable manner.
2. Graduate will be able to analyze complex problems related to IC engines, RAC equipments, Turbo Machines for improvement of performance.
3. Graduate will be able to handle the problems associated with manufacturing of goods using latest technology and tools while ensuring productivity, quality and economy.

MECHANICAL ENGINEERING

S.E. MECHANICAL - I

ME211. ANALYSIS OF MECHANICAL ELEMENTS

At the end of course, students will be able to

1. Determine simple & critical stresses & strains in member subjected to different types of loads. (Axial, shear etc.)
2. Draw distribution diagrams (S.F.D /B.M.D, shear & bending stresses) in determinate beams & various sections.
3. Analyze behavior of structural members subjected to axial, shear, bending, & twisting loads.
4. Find load resultant stresses, torsional strength, modulus of resilience variation in instantaneous elongation, slope & deflection
5. Decide & design c/s, shape, and section shaft for different loads.

ME212. APPLIED THERMODYNAMICS

At the end of course, students will be able to

1. Apply knowledge of mathematics and science to solve real thermodynamics problems.
2. Calculate the efficiency of mechanical devices like boiler, compressor, steam turbine, etc.
3. Apply knowledge of basic thermodynamic concepts such as temperature, pressure, work & heat, internal energy, enthalpy and entropy to systems.
4. Design and analyze power producing devices used in practice such as boilers and turbines.

ME213. ENGINEERING MATHEMATICS-III

At the end of course, students will be able to

1. Solve higher order linear differential equations and mechanical applications
2. Solve linear and non-linear Partial differential equations
3. Determine potential function for irrotational force, gradient, divergence, velocity and acceleration of a vector.
4. Perform data analysis using statistical methods
5. Evaluate analytic function, Harmonic function and line integral

Course Outcomes

ME214. MANUFACTURING PROCESSES

At the end of course, students will be able to

1. Select appropriate manufacturing process for a given component.
2. Understand performance of each process.
3. Prepare manufacturing plan for the given component.

ME215. MACHINE DRAWING

At the end of course, students will be able to

1. Create drawings as per BIS standards
2. Apply technique for assembly drawing from the detail/components
3. Incorporate limits, fits and tolerances for components on the working/engineering drawings
4. Become Familiar in using drafting software

ME216. PROFESSIONAL ELECTIVE-I

A. COMPUTER PROGRAMMING IN C++

At the end of course, students will be able to

1. Develop algorithm for solving problems using object oriented language
2. Solve various computing problems in the field of mechanical engineering.

B. DOT NET

At the end of course, students will be able to

1. Demonstrate the use of .NET framework in building robust software applications using C# programming language.
2. Design and Develop object oriented application on windows platform.
3. Implement the concept of Multithreading

C. GENERAL PROFICIENCY

At the end of course, students will be able to

1. Use a structured presentation methodology to prepare presentation material and effective visual aids.
2. Write abstract, review article and literature survey.
3. Participate dynamically in group discussion and can face mock personal interview successfully
4. Exhibit various soft skills like email writing, task management, elevator pitch, SWOT analysis etc.

ME217. WORKSHOP PRACTICES –II

At the end of course, students will be able to

1. To operate different machine tools such as grinders, lathes, drilling machines etc.
2. To machine the component as per specified dimensions.
3. To develop the skills necessary for engineering practices like joining and forming processes.
4. To Choose and apply the appropriate methods for pattern making & sheet metal working

S.E. MECHANICAL - II

ME221. THEORY OF MACHINE – I

At the end of course, students will be able to

1. Describe the basics of machines, mechanisms & power transmission.
2. Identify nature of Kinematic pairs, chains, mechanisms.
3. State/apply laws of friction, steering & theories of Uniform pressure & wear.
4. Construct & analyze velocity & acceleration of links in mechanisms using different methods, cam profile, & drives.
5. Operate & maintain machine & mechanism used in automobile, machine tools etc.

Course Outcomes

ME222. MACHINE TOOLS & PROCESSES

At the end of course, students will be able to

1. Exhibit knowledge of conventional, unconventional & modern machining processes and machine tools.
2. be able to select proper manufacturing process for the typical application

ME223. FLUID MECHANICS

At the end of course, students will be able to

1. Use fluid properties & various laws related to fluids
2. Address the issues related to fluid statics
3. Identify type of flow & calculate various flow parameters
4. Apply the Bernoulli's equation to solve problems in fluid dynamics
5. Perform dimensional analysis for research problems in fluid mechanics
6. Solve problems related to drag, lift, boundary layer theory
7. Explain the latest methods of analysis & software.

ME224. ELECTRICAL AND ELECTRONICS TECHNOLOGY

At the end of course, students will be able to

1. Select the electrical drives for different mechanical processes.
2. Understands concept of electrical heating and welding.
3. Analyze and design digital circuits.
4. Realize the working of signal conditioner and operational amplifiers.
5. Use the microprocessor and microcontroller for different applications.
6. Simulate above circuits using simulation software and can interpret results.



ME225. PROFESSIONAL ELECTIVE-II

A. COMPUTATIONAL TECHNIQUE AND NUMERICAL METHODS

At the end of course, students will be able to

1. Use drafting software
2. Apply computer graphics techniques/tools of 2D and 3D modeling for communicating effectively.
3. Carry out applications using modern Engineering tools.

B. SIMULATION TECHNIQUES

At the end of course, students will be able to

1. Analyze the output of simulated systems
2. Evaluate the parameters of mechanical systems using simulation methods.

ME226. WORKSHOP PRACTICE – III

At the end of course, students will be able to

1. Create simple patterns and perform basic sheet metal tasks.
2. Choose and apply the appropriate methods for pattern making & sheet metal working

Course Outcomes

T.E. MECHANICAL - I

ME311. THEORY OF MACHINE –II

At the end of course, students will be able to

1. Select gears & gear trains as per requirement
2. Design different types of gear trains
3. Review turning moment diagram & design flywheel for various applications
4. Judge the effect of gyroscopic couple on different vehicles
5. Perform balancing of rotary & reciprocating masses
6. Solve the issues related to vibration & damping

ME312. HEAT AND MASS TRANSFER

At the end of course, students will be able to

1. Classify Heat Transfer Mechanisms
2. Represent mathematically Heat Transfer phenomenon.
3. Calculate Heat transfer rate of a system
4. Identify Applications of extended surfaces.
5. Analyze heat exchangers by LMTD and NTU methods
6. Evaluate effect of convection coefficient and shape factor.

ME313. METALLURGY

At the end of course, students will be able to

1. Demonstrate the relevance of operation of physical metallurgy and its significance
2. Apply their knowledge regarding selection of materials for engineering applications
3. Demonstrate the heat treatment process and their applications in the field of automotive and machine tool industries.
4. Get acquainted with advanced materials and their applications.



Course Outcomes

ME314. MACHINE DESIGN – I

At the end of course, students will be able to

1. Select the proper material for mechanical components
2. Explain Design Process
3. Design Mechanical Components such as springs, shafts
4. Analyze temporary and permanent joints
5. Estimate the fatigue life of the mechanical component
6. Implement standardization in design of machine elements

ME315. PROFESSIONAL ELECTIVE –I

A. MACHINE TOOL DESIGN

At the end of course, students will be able to

1. Demonstrate principle of machine tool design.
2. Design machine tool structure, guide ways, slideways and column.
3. Select machine tool drives, design calculations for spindle, bearing.
4. Do dynamic analysis of machine tools and control systems.

B. FLUID MACHINERY AND FLUID POWER

At the end of course, students will be able to

1. Classify turbines and pumps.
2. Select water turbines, gas turbines & centrifugal pumps to meet the specific requirements
3. Represent velocity triangles for turbines and pumps
4. Analyze different components of hydraulic and pneumatic systems.
5. Synthesize different hydraulic & pneumatic circuits needed for different applications.

C. MATERIAL HANDLING SYSTEMS

At the end of course, students will be able to

1. Design and process material handling System like storing, hoisting, and conveying equipments.
2. Implement CIMS in material handling systems.
3. Implement safety regulations in material handling

ME316. ADVANCED COMPUTER PROGRAMMING-I

A. (JAVA PROGRAMMING)

At the end of course, students will be able to

1. Install JAVA IDE & develop simple applications using JAVA.
2. Read from and write to text and excel files and debug errors.
3. Write JAVA applet for windows based applications such as Word & Excel and JAVA scripts for CAD software such as CATIA & AutoCAD.
4. Develop a small JRE based application or Applet for a mechanical engineering subject.

B. (VISUAL BASIC PROGRAMMING)

At the end of course, students will be able to

1. Install Visual Basic IDE & develop simple applications using Visual Basic.
2. Write VB macros for windows based applications such as Word and Excel & a VBA scripts for CAD software such as CATIA & AutoCAD etc.
3. Read from and write to text and excel files and debug errors.
4. Develop and manage simple databases.

ME317. WORKSHOP PRACTICE – IV

At the end of course, students will be able to

1. Create confidence amongst the students in Production / manufacturing activities.
2. Students should get experience about manual skills required to perform machining operations.
3. Create confidence in students while designing limits, fits & tolerances during manufacturing.
4. Create awareness in students regarding time management, work study, method study & tool engineering

T.E. MECHANICAL - II

ME321. METROLOGY AND MECHANICAL MEASUREMENTS

At the end of course, students will be able to

1. Organize the setup of different instruments for accurate measurement.
2. Describe the principle of operation and working of various gauges
3. Explain applications of different measuring devices and equipments
4. Design and develop simple measuring apparatus for measurement of dimensions and physical properties.
5. Calibrate an instrument and can plot calibration curve using more accurate standards
6. Use the different instruments for various industrial applications such as quality control, process control etc.

ME322. INTERNAL COMBUSTION ENGINES

At the end of course, students will be able to

1. Recognize and understand the reasons for differences in the construction of different types of ICE
2. Understand the reasons for differences in operating characteristics of different engines
3. Select appropriate engine for a given application
4. Conduct performance tests on engines and compare results with predictions

ME323. CAD/CAM

At the end of course, students will be able to

1. Handle CAD related problems from industries.
2. Handle CAM related problems of manufacturing industries.
3. Learn CAD/CAM software to be updated with time.
4. Design NC Part Programs to suit Industrial requirements.

ME324. MACHINE DESIGN – II

At the end of course, students will be able to

1. Select the power transmission system
2. identify the elements of the power transmission system
3. Design various Mechanical Elements such as gears, bearings
4. Explain the optimum design process
5. Implement standardization in design of pressure vessels

ME325. PROFESSIONAL ELECTIVE –II

A. EXPERIMENTAL STRESS ANALYSIS

At the end of course, students will be able to

1. Apply various stress analysis methods such as photo elasticity, strain gauges, moiré fringes, brittle coating methods in typical stress analysis problems.
2. Implement strain gauge systems for measurement of force, torque.
3. Implement rosette system for stress analysis.

B. POWER PLANT AND ENERGY ENGINEERING

At the end of course, students will be able to

1. Estimate various loads on the power plants and carry out energy audit.
2. Calculate electricity charges for various consumers.
3. Realize the potential of non conventional energy resources and its impact on environment.
4. Make environmental impact assessment for thermal, hydro, gas & atomic power plants.

C. TOOL ENGINEERING

At the end of course, students will be able to

1. Do calculations involved in the mechanics & economics of operations.
2. Design & draw the tools & toolings for the given situation & operation.
3. Conceive & develop solutions, devices, contrivances to overcome present problems of the real world.

Course Outcomes

D. MECHANICAL VIBRATION

At the end of course, students will be able to

1. Understand the various aspects related to mechanical vibrations.
2. Develop the ability to analyze the problem related to mechanical vibration.

ME326. ADVANCED COMPUTING TECHNIQUES

A. MATLAB

At the end of course, students will be able to

1. Solve mathematical problems using Matlab and Plot 2D and 3D curves for mathematical functions.
2. Solve differential and algebraic equations using symbolic math toolbox.
3. Write simple Matlab Code for simple Image processing problems.
4. Use Simulink to solve elementary control problems

B. SCILAB

At the end of course, students will be able to

1. Solve mathematical problems using Scilab and Plot 2D and 3D curves for mathematical problems.
2. Write Scilab code for various statistical applications.
3. Write Scilab Code for simple Image processing problems.
4. Solve simple transfer function control problems using Scicos tool.

ME327. WORKSHOP PRACTICE – V

At the end of course, students will be able to

1. To create confidence amongst the students in Production / manufacturing activities.
2. get experience about manual skills required to perform machining operations.
3. To create confidence in students while designing limits, fits & tolerances during manufacturing.
4. To create awareness in students regarding time management, work study, method study & tool engineering

Course Outcomes

B. E. (MECHANICAL) - I

ME411. AUTOMATIC CONTROL ENGINEERING

At the end of course, students will be able to

1. Work confidently with Block Diagram Representations of Control System
2. Use Laplace Transforms to describe Transfer Function of Engineering System and determine the time domain response to a wide range of inputs
3. Solve transient control problems using root locus method by hand and in Matlab/Scilab.
4. Solve Frequency response problems using Bode plots by hand and in Matlab/Scilab.

ME412. OPERATIONS RESEARCH

At the end of course, students will be able to

1. Apply various optimization techniques to industrial applications.
2. Develop a project plan for the industry or organization.

ME413. REFRIGERATION AND AIR CONDITIONING

At the end of course, students will be able to

1. Compare and select different refrigeration methods
2. Do performance evaluation of refrigeration systems
3. Design sustainable air-conditioning systems
4. Evaluate the performance of air-conditioning systems

ME414. PROFESSIONAL ELECTIVE - 3

A. AUTOMOBILE ENGINEERING

At the end of course, students will be able to

1. Demonstrate & explain various systems in an automobile
2. Describe importance and features of different elements like axle, differential, brakes, steering, suspension, wheel balancing etc.
3. Explain principle of operation, construction and applications of various sensors used in modern automobile

B. PROCESS ENGINEERING

Course Outcomes

At the end of course, students will be able to

1. Plan the processing of a component in given situation
2. Draw process pictures for each & every operation as per process plan
3. Compare alternatives & select process, machines and tools by reviewing feasibility.

ME415. FREE ELECTIVE – I

A. INDUSTRIAL ROBOTICS

At the end of course, students will be able to

1. Solve forward and inverse kinematic equations for robot motion.
2. Interface common sensors and actuators to robots
3. Implement software for control of robots
4. Implement simulation models in MatLab and ADAMS

B. SUGAR ENGINEERING

At the end of course, students will be able to

1. Understand the nomenclature used in Sugar Engineering
2. Demonstrate the knowledge of various mechanical equipments/machinery and chemical processing of Sugar Industry.
3. Understand mechanical engineering concepts related to Sugar industry

C. INDUSTRIAL ROBOTICS

At the end of course, students will be able to

1. Solve forward and inverse kinematic equations for robot motion
2. Interface common sensors and actuators to robots
3. Implement software for control of robots such as Workspace LT
4. Implement simulation models in Matlab/Scilab



Course Outcomes

D. TEXTILE ENGINEERING

At the end of course, students will be able to

1. Understand the nomenclature used in textiles
2. Demonstrate the knowledge of yarn formation, fabric formation, and chemical processing of textiles.
3. Understand mechanical engineering concepts related to textile industry

E. ENTREPRENEURSHIP DEVELOPMENT

At the end of course, students will be able to

1. Avail various government facilities required to set-up small unit.
2. Prepare a project report for setting a small manufacturing or service unit.
3. Find the solutions for problems face by SMEs.

B.E. MECHANICAL - II

ME421. INDUSTRIAL AND QUALITY MANAGEMENT

At the end of course, students will be able to

1. Explain the Management concepts and Functions of Management
2. Identify the social responsibilities and ethics in Management
3. Analyze and apply the various management tools and techniques for solving Industrial problems
4. Use different skills such as communication, conceptual, interpersonal etc. during his job
5. Define quality and is able to explain various concepts related to quality and quality control.
6. Student exhibit the knowledge of total quality management (TQM)
7. Identify, analyze the quality problems and can apply appropriate QC tool to solve it.

Course Outcomes

ME422. INDUSTRIAL ENGINEERING

At the end of course, students will be able to

1. Analyze & measure productivity.
2. Perform method study and work measurement etc.
3. Develop improved method of working/process for manufacturing /service sector.

ME423. PROFESSIONAL ELECTIVE - 4

A. MECHATRONICS

At the end of course, students will be able to

1. Develop State transition diagrams for control of physical systems
2. Interface common sensors and actuators to PC or microcontrollers
3. Implement software for control of mechatronic systems
4. Implement control using PLCs
5. Develop State transition diagrams for control of physical systems

B. COMPUTATIONAL FLUID DYNAMICS

At the end of course, students will be able to

1. Formulate and solve computational problems arising in the flow of fluids.
2. Assess the accuracy of numerical solutions by comparison to known solutions of simple test problems and by mesh refinement studies.
3. Use and develop flow simulation software for the most important classes of flows in engineering and science.

C. PRODUCTION AND OPERATION MANAGEMENT

At the end of course, students will be able to

1. Apply the principles and techniques used in production management.
2. Solve the problems related to production.



ME424. FREE ELECTIVE - II

A. SOFTWARE ENGINEERING & CYBER SECURITY

At the end of course, students will be able to

1. Select a proper software life cycle model for design and development.
2. Prepare a prototype model
3. Focus on the fundamentals of developing a Software Project.
4. Get Software Requirement Specification from client, analyze, design and estimate the cost of development of a Software Project.
5. a student will be acquainted with the Cyber security norms

B. AGRO MACHINE ENGINEERING

At the end of course, students will be able to

1. Distinguish between various agro operations such as ploughing, harrowing, threshing etc.
2. Select and design mechanism for various agro machines

C. PLASTIC ENGINEERING

At the end of course, students will be able to

1. Select the plastic materials for particular end user application.
2. Predict the structure and properties of different kind of plastic material.
3. Know the processing of different plastic material based on the end user requirement

D. ECONOMICS FOR ENGINEERING

At the end of course, students will be able to

1. Understand the concepts of economics and its impact on industrial development
2. Demonstrate the decision making abilities based on economic method to appraise alternatives
3. Apply economical analytical techniques to solve engineering problems

Course Outcomes

Common for all branches

S.E.

ENV21 and ENV22 ENVIRONMENTAL STUDIES

1. Describe the natural environment and its relationships with human activities.
2. Explain the ethical means and technological methods for sustainable management of environmental systems.
3. Explain social, economical and legal policies involved in the resolution of environmental problems.



GENERAL ENGINEERING

F.E. -I

C011. ENGINEERING PHYSICS

At the end of course, students will be able to

1. Express the basic concepts of diffraction and polarization and can relate them to day to day observable phenomena.
2. Reveal the formation of materials and their internal structure.
3. Apply basic concepts of acoustics and ultrasonic for basic civil and other engineering applications.
4. Relate space, time, mass and energy equations.
5. Compile the applications of laser and fiber optics in the field of industry, medical and telecommunication.
6. Explain the principles of fission and fusion, significance for power generation and basic concepts of nanoscience

C012. ENGINEERING CHEMISTRY

At the end of course, students will be able to

1. Describe importance of quality of water and appropriate water treatment process.
2. Recognize various types of corrosion & propose a suitable prevention technique.
3. Describe various instrumental techniques and environmental friendly chemical syntheses.
4. Identify and explain different engineering materials like metals, ceramics, fuels, lubricants, polymers for various engineering and day to day applications.
5. Calculate hardness of water, concentration of unknown solution, calorific value of fuels, saponification & acid value of oils, molecular weight of polymers etc.

C112. ENGINEERING MATHEMATICS- I

At the end of course, students will be able to

1. write higher order derivative of standard functions
2. express the power series expansion of a given function and evaluate limits
3. Apply De-Moivre's theorem to determine roots of polynomial and can express hyperbolic, inverse

Course Outcomes

hyperbolic functions.

4. Use matrices techniques for solving system simultaneous linear equations , Eigen values and Eigen vectors of the matrix
5. Evaluate partial derivatives and can implement to estimate maxima and minima of multivariable function

C113. APPLIED MECHANICS

At the end of course, students will be able to

1. Apply fundamental knowledge of engineering mechanics for rigid bodies acted upon by system of forces.
2. Analyze various types of statically determinate pin jointed trusses by analytical and graphical methods.
3. Apply knowledge of kinematics of rigid body motion to solve engineering problems in dynamics.
4. Apply knowledge of kinetics of rigid body motion to solve engineering problems in dynamics.
5. Solve problems relating work, power and energy in various contexts of engineering.

C114. BASIC ELECTRICAL ENGINEERING

1. Apply the network theorems to analyze dc circuits and calculate energy consumption in electrical systems.
2. Use the concept of magnetic circuits to calculate parameters of circuits and single phase transformer
3. Apply knowledge of ac fundamentals to analyze series & parallel ac circuits.
4. Use the concept of poly phase ac circuit to analyze three phase star, delta circuits and working of electrical drives.

C115. BASIC MECHANICAL ENGINEERING

At the end of course, students will be able to

1. Calculate the heat and work quantum in the area of refrigeration & air conditioning system and I.C. engines.
2. Categorize and select the type of power producing/absorbing systems for a typical application.
3. Select the power transmission element for day to day applications and identify various design considerations in mechanical engineering design.

Course Outcomes

4. Select a proper machining/joining process for required application.

C116. COMMUNICATION SKILLS

At the end of course, students will be able to

1. Frame grammatically correct sentences for day to day communication
2. Use appropriate words in oral and written communication.
3. Demonstrate effective speaking skills in various situations
4. Comprehend and analyze a passage.
5. Draft letters, emails and write paragraphs with appropriate content and context.

C117. WORKSHOP PRACTICE

At the end of course, students will be able to

1. Draw, design and fabricate different carpentry joints.
2. Prepare different shaped metal work piece joints from the given metal blanks by selecting different tools and machines.
3. Perform different types of welding of metal components.
4. Select different engineering tools required to perform carpentry, fitting and welding processes.
5. Carry out pipe fitting and plumbing work.

F. E. -II

C122. ENGINEERING MATHEMATICS –II

At the end of course, students will be able to

1. Solve first order ordinary differential equation and able to apply in different engineering applications
2. Use different vector differential operators
3. Test divergence & convergence of infinite series
4. Explain curve tracing with justification.
5. Evaluate improper and multiple integrals and determine area, mass of region bounded between curves

Course Outcomes

C123. ENGINEERING GRAPHICS

At the end of course, students will be able to

1. Draw projection of lines and planes for engineering applications.
2. Draw regular and sectional views of various types of solids.
3. Draw the 2 D view (orthogonal views) given 3D drawing
4. Draw the development of the regular and truncated solids.

C124. BASIC CIVIL ENGINEERING

At the end of course, students will be able to

1. Describe the role of civil engineer in the development of the society and explain relationship of civil engineering with other branches of engineering and technology.
2. Discuss types of buildings and select materials of construction.
3. Explain the elements of water supply such as dam, canal and elements of transportation structures.
4. Measure heights, distances and angles on ground using basic surveying instruments and plot them on paper.
5. Explain the advantages of advances in civil engineering like remote sensing techniques, GIS and GPS.

C125. COMPUTER PROGRAMMING

At the end of course, students will be able to

1. Design flowchart / algorithms for given problem
2. Write, compile, debug & execute structured C programs by applying knowledge of various C features like control and loop structures.
3. Write, compile, debug & execute structured C programs by applying knowledge of various C features like array, pointer and function.
4. Apply features like structure and unions efficiently in small C applications.

Course Outcomes

C126. BASIC ELECTRONICS

At the end of course, students will be able to

1. Test and measure various electronic components.
2. Explain construction, biasing, V-I characteristics and application of diode and BJT.
3. Select appropriate transducers to measure various physical parameters like distance, temperature etc.
4. Perform arithmetic operations on digital number system.
5. Draw truth table of logic gate and solve Boolean expressions.

C127. PROFESSIONAL COMMUNICATION

At the end of course, students will be able to

1. Prepare good quality presentation and deliver it effectively.
2. Participate dynamically in group discussion and can face mock personal interview successfully
3. Prepare good quality resume and various other reports.
4. Exhibit various soft skills like team working and leadership in different situations.

C128. AUDIT COURSE-WORKSHOP FOR SKILL DEVELOPMENT

At the end of course, students will be able to

1. Student exhibit specified technical skills
2. complete a small project in a group
3. write a brief technical report related to project