

PSN COLLEGE OF ENGINEERING AND TECHNOLOGY

Department of Mechanical Engineering

COURSE OUTCOMES R18

**501001 -TECHNICAL ENGLISH
OUTCOMES**

On successful completion on this course the student will be able to

- write cohesively and coherently and flawlessly avoiding grammatical errors
- Listen/view and comprehend different Spoken discourses/excerpts in different accents
- communicate with one or many listeners' using appropriate communicative strategies
- read different genres of texts adopting various reading strategies
- Writing skills enable a student o write comprehend passages, report and paragraph.
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**501002-ELEMENTARY MATHEMATICS FOR ENGINEERS
OUTCOME:**

On successful completion on this course the student will be able to

1. Find the Eigen values and Eigen vectors by matrix methods.
2. Understand different types of sequences of series and their convergence.
3. Know the concepts of differentiation and integration and applications of indefinite integral.
4. form and solve the inequalities by LPP and solve transportation problems.
5. Understand the concepts of three dimension and form the equations of tangent plane, cone.

501003-APPLIED PHYSICS - I

On successful completion on this course the student will be able to

1. Understand the properties of different types of metals
2. Gain knowledge about conductivity of different types of materials
3. Study about magnetism property of the materials
4. Know the applications of sound waves in engineering & medicine
5. Understand the application of laser in engineering & medicine

501004-APPLIED CHEMISTRY - I

On successful completion on this course the student will be able to

1. Do water Treatment for domestic & industrial purpose
2. Study different kinds of advanced materials and their applications
3. Study different kinds of polymers & their applications
4. Basics of thermo dynamics and its concept
5. Familiar with name materials & their applications in different fields

501005-ENGINEERING GRAPHICS

On successful completion on this course the student will be able to

- CO1. Perform free hand sketching of basic geometrical shapes and multiple views of objects.
- CO2. Draw orthographic projections of lines, planes and solids
- CO3. Obtain development of surfaces.
- CO4. Prepare isometric and perspective views of simple solids.

501006-FUNDAMENTALS OF COMPUTERS AND PYTHON PROGRAMMING

CO1 :have fundamental knowledge on basics of computers and Number System

CO2:work on MS-Office

CO3:write, compile and debug simple programs in Python

CO4:understand the concept of functions in Python

CO5:use different Compound data types in Python.

501101-APPLIED PHYSICS AND CHEMISTRY LABORATORY - I

1. Gain practical knowledge by applying the experimental methods to correlate with physics and chemistry theory.
2. Able to gain Working knowledge of fundamental Physics and chemistry.
3. Ability to apply the design process to engineering application.

Ability to use modern engineering techniques and tools, including software and laboratory instrumentation.

501102- COMPUTER LAB

Co1 Create and edit their own documents, sheets and presentation

Co 2 Write their own programs to solve problems by using python

501103- WORKSHOP PRACTICE LAB

Course Outcomes:

On successful completion on this course the student will be able to On

CO 1: Apply the knowledge of pipeline connections to household fittings and industrial buildings.

CO 2: Prepare the different joints in roofs, doors, windows and furniture.

CO 3: Perform the various welding processes and know about its applications.

CO4: Produce a tray and funnel using sheet metal.

CO5: Prepare square fitting and "V" fitting

501007-Business Communication and Presentation Skills

OUTCOMES

On successful completion on this course the student will be able to

CO 1: Communicate with one or many listeners' by using effective business communication.

CO 2: Create formal reports and proposals cohesively and creatively and flawlessly.

CO 3: Understand basic communicative mannerisms, cultural factors and emotional intelligence.

CO 4: Develop and deliver powerful presentation and confidence in public speaking.

CO 5: Produce resumes and cover letters.

501008-ENGINEERING MATHEMATICS I

OUTCOME:

On successful completion on this course the student will be able to

- 1.Find the optimal value o by partial differentiation and to find area and volume by integrals.
- 2.To apply Jacobian, divergence, curl in Engineering.
- 3.Solve line, path and surface integrals.
- 4.Solve ordinary differential equations by various methods.
- 5.Distinguish analytic functions and their properties.

501009- APPLIED PHYSICS – II

On successful completion on this course the student will be able to

- CO 1:** Find the energy of small particle
- CO 2:** Find the structure of different material in different temperature
- CO 3:** Study different types of fiber optics used in communication systems
- CO 4:** Gain knowledge on the thermal properties of different types of materials
- CO 5:** Study the engineering applications of magnetic materials

501010- APPLIED CHEMISTRY – II

On successful completion on this course the student will be able to

- CO 1:** Know the Principles & applications of electro chemistry
- CO 2:** Understand about corrosion & its protection techniques
- CO 3:** Gain Knowledge about materials used in energy production
- CO 4:** To study the properties of different kinds of alloys & its application
- CO 5:** Understand various instrumental techniques for sample processing

501011-Engineering Mechanics

- CO 1:** Illustrate the vectorial and scalar representation of forces and moments
- CO 2:** Evaluate the properties of surfaces and solids
- CO 3:** Analyze the different type of motion
- CO 4:** Determine the friction and the effects by the laws of friction
- CO 5:** Calculate dynamic forces exerted in rigid body

501012-PROGRAMMING IN C

Have fundamental knowledge on C language
Design programs involving decision structures, loops and functions
Define small functions for solving complex applications
Write, compile and debug programs in C language using Arrays
Understand the concept of Structure and Union

501013-BASIC ENGINEERING

- CO1:** Explain the usage of construction material and proper selection of construction materials and also measure distances and area by surveying.
- CO2:** Understand the basics of Energy Sources and Power Generation
- CO3:** Acquire the knowledge about various manufacturing processes.
- CO4:** Solve simple circuits and express the concept of fundamentals of circuits
- CO5:** Express the function of semiconductor devices and develop the truth tables of logic gates.

501104-APPLIED PHYSICS AND CHEMISTRY LABORATORY – II

- CO 1:** Gain practical knowledge by applying the experimental methods to correlate with physics and chemistry theory.
- CO 2:** Apply the various procedures and techniques for the experiments.
- CO 3:** Apply the various procedures and techniques for the experiments.
- CO4:** Develop basic communication skills through working in groups in performing the laboratory experiments and by interpreting the results.
- CO 5:** Ability to use the different measuring devices and meters to record the data with precision.

501105-C PROGRAMMING LAB

OUTCOMES:

On successful completion on this course the student will be able to

- CO 1: Able to solve simple problems using C' Language
- CO 2: Able to execute programs using control statements
- CO 3: Able to handle arrays in C' Programs
- CO 4: Able to write functions and to solve some complicated problems in C.

501106-BASIC ELECTRICAL AND ELECTRONICS LABORATORY

At the end the course the students can able to,

- CO1 : Design House wiring system
- CO2 : Measure the various Electrical Quantities in a circuit
- CO3 : Attend the trouble shooting of electrical equipments
- CO4 : Check the status of Semiconductor devices
- CO5 : Check the Functioning of Logic Gates

501014 ENGINEERING MATHEMATICS II

OUTCOME:

On successful completion on this course the student will be able to

- CO 1. Find the Fourier series for a function defined on closed interval.
- CO 2. Formulate and solve PDE of first order.
- CO 3. Formulate and solve PDE of higher order.
- CO 4. Choose an appropriate method to solve complex integration.
- CO 5. Identify problem evaluation techniques in theory of equation.

510001 FLUID MECHANICS & MACHINERY

- CO 1:** Explain the fundamentals of fluid properties and fluid flows.
- CO 2:** Use Euler and Bernoulli's equations for various applications.
- CO 3:** Apply dimensional analysis to simple problems
- CO 4:** Apply principles of fluid mechanics to the operation, design, and selection of hydraulics turbines.
- CO 5:** Analyze the performance of hydraulic pump

510002 ENGINEERING THERMODYNAMICS

- CO1.** Explain the basic concepts of thermodynamics such as system, state, state postulate, equilibrium, properties, process and cycle.
- CO2.** Demonstrate the procedures for determining thermodynamic properties of pure substances from tables of property data and calculate the same when two independent properties are known.
- CO3.** Calculate work in case of a system executing various thermodynamic, processes that involve either ideal gas or pure substance as working fluid.
- CO4.** State and Apply the first law of thermodynamics for a closed and open systems.
- CO5.** State & Apply second law of thermodynamics. State & Apply the concept of entropy

510003 MATERIAL AND METALLURGICAL SCIENCE(Theory with Practical Components)

At the end of the course, the student will be able to

- CO1. Classify the structure of materials at different levels
- CO2. Identify the mechanism of fracture and deformation of crystalline materials.
- CO3. Apply material testing and metallography technique for testing industrial components.
- CO4. Interpret the concept of phase, phase diagrams & basic terminologies associated with metallurgy.
- CO5. Summarize & classify different heat treatment and surface treatment techniques.

510004 MANUFACTURING TECHNOLOGY – I

Course outcomes

After successful completion of the course, the student would be able to

- CO1: To identify various types and defects in metal casting process
- CO2: To Compare different metal joining processes
- CO3: To Explain various advanced metal joining processes.
- CO4: Summarize various hot working and cold working methods of metals
- CO5: To Explain various sheet metal making processes

510005 FUNDAMENTALS OF ELECTRICAL DRIVES

COURSE OUTCOMES:

At the end of the course the students will able to,

- CO1:** Explain the concepts of Electrical drives
- CO2:** Discuss about the characteristics of DC Motors
- CO3:** Describe the starting methods of DC and AC motors.
- CO4:** Discuss about the speed control of DC Motors
- CO5:** Discuss about the speed control of AC Motors

510101 FLUID MECHANICS AND MACHINERY LAB

COURSE OUTCOMES:

At the end of the course the students will able to,

- CO 1: Determine the discharge coefficient for Venture and Orifice meter.
- CO 2: Calculate the frictional loss through pipes and draw the characteristic curves for pumps.
- CO 3: Evaluate the performance of turbines and verify Bernoulli's theorem.
- CO 4: Drawing the characteristic curves of Gear pump/ reciprocating pump.

510102 **MANUFACTURING TECHNOLOGY LAB – I**

COURSE OUTCOMES:

After successful completion of the course, the student would be able to

CO 1: Make the work piece as per given shape and size using Lathe, Shaper

CO 2: Join two metals using Arc welding.

CO 3: Join two metals using Gas welding.

CO 4: Use different moulding tools, patterns and prepare sand moulds.

510103 **ELECTRICAL MACHINES LAB**

COURSE OUTCOMES:

At the end of the course, the student will be able to

CO1: Determine characteristics of various electrical drives depending on their type excitation.

CO2: Develop knowledge helpful for application of DC and AC machines.

CO3: Perform speed control of different types of electrical drives.

CO4: Perform different types of testing in electrical drives.

CO5: Apply the procedure to conduct speed control tests on electrical drives.

501109 **CAREER SKILL DEVELOPMENT – I**

COURSE OUTCOMES:

At the end of the course, the student will be able to

CO1: Acquire knowledge on English Grammar, Analytical & Logical reasoning

CO2: Facilitated to set their career goals.

501801 ENVIRONMENTAL STUDIES

COURSE OUTCOMES:

At the end of the course, the student will be able to

CO1: Understand the different environmental systems.

CO2: Know about biodiversity.

CO3: Understand different environmental pollution.

CO4: Study and understand the natural resources.

CO5: Understand social issues

501020 Engineering mathematics-III

COURSE OUTCOMES:

At the end of the course, the student will be able to

CO 1: Apply Laplace transform in Engineering.

CO 2: Evaluate the Fourier transform of continuous functions.

CO 3: Solve difference equation by Z- Transform.

CO 4: Apply PDE in Engineering.

CO 5: Understand the concept of logics.

510006 STRENGTH OF MATERIALS

COURSE OUTCOMES

At the end of the course, the student will be able to

CO1 : Determine stresses and straining in various axially loaded members

CO2 : Able to apply failure theories in designing engineering systems like bars, beams, thin shells etc

CO3 : Construct shear force and bending moment diagrams to estimate the shear stress and bending force respectively in beams.

CO4: Estimate slope and deflection of beams and buckling load in columns.

CO 5: Determine the stresses and deformation in shafts and helical springs.

210007 THERMAL ENGINEERING

COURSE OUTCOMES

At the end of the course, the student will be able to

CO 1: Students will be able to identify and analyze some ideal cycles: e.g. Rankine's cycle, Otto's cycle, Diesel's cycle and the Brayton's cycle, Ideal vapor compression cycles.

CO 2: Able to know operational principles and elements of SI and CI engines and also to calculate performance test.

CO 3: Understand the working of different types of steam nozzles and turbines, calculation of performance parameters and methods of turbine compounding to reduce rotor speed of an impulse turbine

CO 4: To familiarize with the types of air compressors and governing equations of various forms.

CO 5: To analyze the usage of Refrigeration and Air conditioning.

510008 THEORY OF MACHINES - I

COURSE OUTCOMES

At the end of the course, the student will be able to

CO1: Understand the basic concepts of Mechanisms, Machines and their relative motions, then apply it to appropriate environments.

CO2: Carry out kinematic analysis (Displacement, Velocity and Acceleration) of simple mechanisms (Single slider Crank Mechanism and four bar Mechanisms) by graphical and analytical method.

CO3: Construct & Design different CAM profiles for given conditions using graphical & Theoretical methods

CO4: Understand basic terminologies and apply laws and principles of gears and gear trains.

CO5: Acquire knowledge of friction in various mechanical components and apply it in different situations

510009 MANUFACTURING TECHNOLOGY - II

COURSE OUTCOMES

At the end of the course, the student will be able to

CO1 Apply theory of metal cutting in machining Process

CO2 Illustrate operational principles of turning machines and its types

CO3 Select manufacturing machines and tools depending upon the need.

CO4 Recommend the types of grinding and broaching machine for finishing process

CO5 Design and develop the manufacturing of mass customized components.

510010 APPLIED HYDRAULICS AND PNEUMATICS

COURSE OUTCOMES

At the end of the course, the student will be able to

- CO1** Select hydraulic components for suitable applications.
- CO2** Select suitable hydraulic control valves for hydraulic circuits.
- CO3** Design hydraulic circuits by selecting suitable components for a given application.
- CO4** Familiarize with the pneumatic components and to select proper pneumatic devices for industrial circuit
- CO5** Design different Pneumatic system for simple applications.

510104 STRENGTH OF MATERIALS LAB

COURSE OUTCOMES

At the end of the course, the student will be able to

- CO1:** Introduce the concept of determining stresses and strains from the member forces.
- CO2:** Provide the basic concepts and effects of axial loads, bending, shear, and torsion on structural components.
- CO3:** Ability to determine the behavior of structural elements, such as bars, beams and columns subjected to tension, compression, shear, bending, and torsion by means of experiments.
- CO4:** Physical insight into the behavior materials and structural elements, including distribution of stresses and strains, deformations and failure modes.

510105 MANUFACTURING TECHNOLOGY LAB - II

COURSE OUTCOMES

At the end of the course, the student will be able to

- CO 1:** Use different machine tools to manufacturing gears
- CO 2:** Modify the shape of the given work piece using shaper
- CO 3:** Ability to use different machine tools for finishing operations
- CO 4:** Ability to manufacture tools using cutter grinder
- CO 5:** Ability to calculate cutting forces

510106 THERMAL ENGINEERING LAB

COURSE OUTCOMES

At the end of the course, the student will be able to

CO 1: Sketch the valve timing diagram and port timing diagram for single cylinder four stroke diesel engine and two stroke petrol engines.

CO 2: Measure the flash and fire point of various fuel/lubricants.

CO 3: Evaluate the performance of four stroke single cylinder CI engine.

CO 4: Conduct a test to find thermal conductivity of various engineering materials.

CO 5: Measure heat transfer rate in free and forced convection environment.

CO 6: Measure COP of refrigeration and air conditioning system and performance of air compressor.

CO 7: Measure the effectiveness of parallel and counter flow heat exchanger.

501113 Career Skill Development Training - II

COURSE OUTCOMES

At the end of the course, the student will be able to

CO 1. Increase their skill of listening, writing and speaking.

CO 2 Increase their personality development, mannerisms Skill and Attitude.

CO 3 Increase their interpersonal relationship.

CO 4 Increase their knowledge of verbal and non verbal reasoning.

CO 5 Increase their experience of group discussion and mock interviews

510012 DESIGNS OF MACHINE ELEMENTS

COURSE OUTCOMES:

At the end of the course, the student will be able to

CO1: Describe the fundamental scientific principles of mechanical design (stress, strain, material properties, failure theories, fatigue phenomena, etc.) and their importance and use in design.

CO2: Calculate the diameter based on strength, rigidity and design various types of coupling based on application

CO3: Calculate the design parameter of permanent and temporary joint on various loading application.

CO4: Select and design a mechanical spring based upon the application and requirements.

CO5: Calculate the design parameter of various types of bearing.

CO/PO Mapping

510013 HEAT AND MASS TRANSFER

COURSE OUTCOMES:

At the end of the course, the student will be able to

CO 1: Understanding the physics involved in various heat transfer mechanisms.

CO 2:Applying the knowledge of mathematics, and analyze the different situations in which heat transfer is involved.

CO 3:To analyze the effect of different boiling regimes and condensation and also through the proper use of modelling can able to choose different heat exchangers for specific applications.

CO 4:To be able to calculate heat transfer rate, time required for heating or cooling and obtaining the temperature distribution with respect to the domain of analysis under different situations.

CO 5:Apply diffusive and convective mass transfer equations and correlations to solve problems for different applications

510014 THEORY OF MACHINE - II

COURSE OUTCOMES:

At the end of the course, the student will be able to

CO 1: Analyze the static and dynamic force in mechanical systems and determine the energy stored in flywheel.

CO 2: Determine the unbalanced force in reciprocating and rotating mass..

CO 3: Apply the fundamental concepts of vibration to determine the natural frequency.

CO 4: Estimate the frequency of damped and forced vibrating systems.

CO 5: Calculate the speed range of governors and determine the gyroscopic couple

510015 MECHANICAL MEASUREMENTS AND METROLOGY

COURSE OUTCOMES:

At the end of the course, the student will be able to

CO1 Apply the knowledge of measuring instruments in industry for selecting appropriate instruments.

CO2. Suggest the linear measuring instruments for measuring dimension with high accuracy.

CO3. Design tolerances and fits for selected product quality.

CO4. Evaluate the quality of the machine tool with alignment test.

CO5. Utilize the mechanical measuring instruments in industries for sequence applications.

DYNAMICS AND METROLOGY LAB

COURSE OUTCOMES:

At the end of the course, the student will be able to

- CO 1. Choose the proper measuring instruments for the measurement of pressure, temperature, linear distance, speed and surface finish etc., using calibration technique,
- CO 2. Identify the composite error of gear tooth using gear tooth tester,
- CO 3. Demonstrate the measurement of tool tip temperature, thread components, angular components
- CO 4. Analyze various types of transmission, apply balancing in machine systems
- CO 5. Analyze various types of CAMS and gears,

510108 COMPUTER AIDED DRAFTING AND MACHINE DRAWING LAB

COURSE OUTCOMES:

At the end of the course, the student will be able to

- CO1: To make the students understand and interpret drawings of machine components
- CO2: To prepare assembly drawings both manually and using standard CAD packages
- CO3: To familiarize the students with Indian Standards on drawing practices and standard components
- CO4: To gain practical experience in handling 2D drafting and 3D modeling software systems.