

COURSE OUTCOMES

Upon completing the course, the student will be able to:

1. **Apply** the successive differentiation to analyze polar curves, evaluate radius of curvature, derivatives of arc length and obtain Taylor's & Maclurin series, expansion of function of single variable.
2. **Apply** the partial differentiation to find Total derivative and Jacobians of a given multivariable functions.
3. **Apply** the Vector differential operator on scalar and vector point functions.
4. **Apply** the reduction formula to evaluate definite integral. Apply various methods of the differential equation to solve first-order linear ODE and its applications to various fields.
5. **Apply** the matrix techniques to reduce the quadratic forms to canonical forms, finding solutions of systems of linear equations in the different areas of Linear Algebra.

MAPPING OF COs WITH POs OF ENGG. MATHEMATICS- I (15MAT11)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C101.1	3	3	-	1	-	-	-	-	-	-	-	1	-	-
C101.2	3	3	-	1	-	-	-	-	-	-	-	1	-	-
C101.3	3	3	-	1	-	-	-	-	-	-	-	1	-	-
C101.4	3	3	-	1	-	-	-	-	-	-	-	1	-	-
C101.5	3	3	-	1	-	-	-	-	-	-	-	1	-	-
C101 (Avg.)	3	3	-	1	-	-	-	-	-	-	-	1	-	-

COURSE OUTCOMES

Upon completing the course, the student will be able to

1. Apply the concepts of electrochemistry in batteries and fuel cells.
2. Interpret the corrosion of metals and techniques to protect the metal.
3. Apply the knowledge of production and consumption of energy for industrialization.
4. Explain the basic properties and applications of various polymers and nanomaterials.
5. Demonstrate various water treatment processes for domestic and industrial purposes.

MAPPING OF COs WITH POs OF ENGINEERING CHEMISTRY (15CHE12)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C102.1	3	3	-	-	-	-	-	-	-	-	-	-	-	-
C102.2	3	3	1	-	-	-	-	-	-	-	-	-	-	-
C102.3	3	3	-	-	-	-	-	-	-	-	-	-	-	-
C102.4	3	3	-	-	-	-	-	-	-	-	-	-	-	-
C102.5	3	3	1	-	-	-	-	-	-	-	-	-	-	-
C102 (Avg.)	3	3	1	-	-	-	-	-	-	-	-	-	-	-

COURSE OUTCOMES

Upon completing the course, the student will be able to

- 1: Understand the basic components of a computer system and the concepts related to Operating systems, storage devices and networking
- 2: Apply basic principles of C Programming to solve a given problem
- 3: Implement modular programming techniques
- 4: Design and develop parallel programs in C

MAPPING OF COs WITH POs OF PROGRAMMING IN C AND DATA STRUCTURES (15PCD13)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C106.1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
C106.2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
C106.3	-	-	2	-	-	-	-	-	-	-	-	-	-	-
C106.4	-	-	2	-	-	-	-	-	-	-	-	-	-	-
C106 (Avg.)	1.5		2	-	-	-	-	-	-	-	-	-	-	-

COURSE OUTCOMES

Upon completing the course, the student will be able to:

1. Describe the principles of orthographic and isometric projections, sections and development of lateral surfaces of solids
2. Demonstrate the utility of CAD Software in obtaining engineering drawings
3. Analyze the basic geometrical entities in different positions and draw their orthographic views
4. Identify the positions of sectioned solids and draw the development of their lateral surfaces
5. Illustrate the isometric view of combination of solids by analyzing the relationships between the parts.

MAPPING OF COs WITH POs OF COMPUTER AIDED ENGINEERING DRAWING (15CED14)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C104.1	3	-	2	-	-	-	-	-	-	3	-	-	-	1
C104.2	-	-	-	-	3	-	-	-	-	2	-	2	-	1
C104.3	2	2	2	-	-	-	-	-	-	2	-	-	-	1
C104.4	2	2	2	-	-	-	-	-	-	2	-	-	-	-
C104.5	2	2	2	-	-	-	-	-	-	2	-	-	-	1
C104 (Avg.)	2.25	2	2	-	3	-	-	-	-	2.2	-	2	-	1

COURSE OUTCOMES

Upon completing the course, the student will be able to:

1. Apply the knowledge of semiconductor diodes and transistors in building basic electronic circuits and explain various biasing methods of transistors
2. Design circuits of inverting and non-inverting amplifiers and various linear applications of OPAMPS.
3. Explore the different building blocks in digital electronics using logic gates and examine Boolean laws for logic functions using basic and universal gates.
4. Implement Flip-Flops using logic gates and explicate the architecture of 8051 Microcontroller and its application
5. Explain the functioning of a communication system, different modulation techniques and interpret basic working principles of transducers.

MAPPING OF COs WITH POs OF BASIC ELECTRONICS (15ELN15)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C105.1	3	-	-	-	-	-	-	-	-	-	-	-	-	-
C105.2	-	-	3	-	-	-	-	-	-	-	-	-	-	-
C105.3	-	3	-	-	-	-	-	-	-	-	-	-	-	-
C105.4	2	-	2	-	-	-	-	-	-	-	-	-	-	-
C105.5	2	-	-	-	-	-	-	-	-	-	-	-	-	-
C105 (Avg.)	2.33	3	2.5	-	-	-	-	-	-	-	-	-	-	-

COURSE OUTCOMES

Upon completing the course, the student will be able to

1. Draw flowcharts and write algorithms for a given problem
2. Implement modular programming and parallel programming concepts
3. Design and develop a C program for the given problem
4. Trace and debug a C program

MAPPING OF COs WITH POs OF COMPUTER PROGRAMMING LABORATORY (15CPL16)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C106.1	2	-	-	-	-	-	-	-	-	-	-	3	-	-
C106.2	-	-	2	-	-	-	-	-	-	-	-	3	-	-
C106.3	-	-	2	-	-	-	-	-	-	-	-	3	-	-
C106.4	-	2	-	-	-	-	-	-	-	-	-	3	-	-
C106 (Avg.)	2	2	2	-	-	-	-	-	-	-	-	3	-	-

COURSE: ENGINEERING CHEMISTRY LABORATORY**COURSE CODE: 15CHEL17****COURSE OUTCOMES**

Upon completing the course, the student will be able to

1. Demonstrate the basic techniques for quantitative analysis.
2. Interpret the application of instruments for chemical analysis.

MAPPING OF COs WITH POs OF ENGINEERING CHEMISTRY (15CHEL17)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C107.1	2	2							2	-	-	-	-	-
C107.2	2	2							2	-	-	-	-	-
C107 (Avg.)	2	2							2	-	-	-	-	-

COURSE OUTCOMES

Upon completing the course, the student will be able to

1. Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale,
2. Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment,
3. Demonstrate ecology knowledge of a complex relationship between biotic and abiotic components
4. Apply their ecological knowledge to illustrate and graph a problem and Describe the realities that managers face when dealing with complex issues

MAPPING OF COs WITH POs OF ENVIRONMENTAL STUDIES (15CIV18)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C108.1	2	-	-	1	-	1		-	-	-	-	-	2	1
C108.2	1		-	-	-	2	1	-	-	-	-	-	1	
C108.3	1	1	-	-	-			-	-	-	-	-	1	
C108.4	2	1	-	1	-	1	1	-	-	-	-	-	1	1
C108 (Avg.)	1.5	1	-	1	-	1.3 3	1	-	-	-	-	-	1.25	1

COURSE OUTCOMES

Upon completing the course, the student will be able to:

1. **Apply** ordinary differential equations to model engineering phenomena such as electrical circuits, forced oscillation of mass spring and elementary heat transfer
2. **Identify** and **Evaluate** the non-linear D. E. to find solution of different non-linear systems.
3. **Apply** partial differential equations to model problems in fluid mechanics, electromagnetic theory and heat transfer
4. **Apply** multiple integrals to find area, volume, mass and moment of inertia of plane and solid region.
5. **Apply** Laplace transform to determine general or complete solutions to linear ODE

MAPPING OF COs WITH POs OF ENGINEERING MATHEMATICS II (15MAT21)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C109.1	3	3	-	1	-	-	-	-	-	-	-	1	-	-
C109.2	3	3	-	1	-	-	-	-	-	-	-	1	-	-
C109.3	3	3	-	1	-	-	-	-	-	-	-	1	-	-
C109.4	3	3	-	1	-	-	-	-	-	-	-	1	-	-
C109.5	3	3	-	1	-	-	-	-	-	-	-	1	-	-
C109 (Avg.)	3	3	-	1	-	-	-	-	-	-	-	1	-	-

COURSE OUTCOMES

Upon completing the course, the student will be able to:

1. Gain Knowledge about Modern physics and quantum mechanics and update the basic concepts.
2. Study of material properties and their applications to apply in engineering applications.
3. Study of laser and optical fibres are used to develop advanced instruments in Engineering.
4. Understand Crystal structure and its applications to enhance the technical skills of students.
5. Expose shock waves concept and its applications, to extend research oriented activity at higher semesters.
6. Understand basic concepts of nano science and technology to inculcate to the current research.

MAPPING OF COs WITH POs OF ENGINEERING PHYSICS (15PHY22)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C110.1	3	2	-	-	-	-	-	-	-	-	-	-	--	-
C110.2	2	3	-	-	-	-	-	-	-	-	-	1	-	-
C110.3	2	-	-	-	-	-	1	-	-	-	-	-	-	-
C110.4	3	2	-	-	-	-	-	-	-	-	-	-	-	-
C110.5	-	-	-	-	1	-	-	-	-	-	-	-	-	-
C110.6	3	2	-	2	-	-	-	-	-	-	-	-	-	-
C110 (Avg.)	3	3	-	2	1	-	1	-	-	-	-	1	-	-

COURSE OUTCOMES

Upon completing the course, the student will be able to:

1. Know the basics of Civil Engineering, its scope of study, knowledge about roads, Bridges and Dams
2. Comprehend the action of forces, moments and other loads on system of rigid bodies.
3. Compute the reactive forces and its effects developed due to external loads.
4. Locate the Centroid and compute Moment of Inertia and radius of gyration of regular geometrical shapes.
5. Establish relationship between the motions of bodies.
6. Pursue studies in allied courses of mechanics.

MAPPING OF COs WITH POs OF ELEMENTS OF CIVIL ENGINEERING AND MECHANICS (15CIV23)

2015 scheme	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C111.1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
C111.2	3	3	1	-	-	-	-	-	-	-	-	-	-	-
C111.3	3	3	1	-	-	-	-	-	-	-	-	-	-	-
C111.4	3	3	1	-	-	-	-	-	-	-	-	-	-	-
C111.5	3	3	1	-	-	-	-	-	-	-	-	-	-	-
C111.6	2	2	1	-	-	-	-	-	-	-	-	-	-	-
C111	2.5	2.8	1	-	-	-	-	-	-	-	-	-	-	-

COURSE OUTCOMES

Upon completing the course, the student will be able to:

1. Identify various energy sources and different energy conversion methods.
2. Analyze working principles of different types of prime movers.
3. Explain different operations in machine tools and applications of robotics and automation.
4. Comprehend the knowledge of engineering materials and its applications, nevertheless acquire the knowledge of joining processes and usage of various engineering materials.
5. Describe the working principle of Refrigeration and Air conditioning systems.

MAPPING OF COs WITH POs OF ELEMENTS OF MECHANICAL ENGINEERING (15EME24)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C112.1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
C112.2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
C112.3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
C112.4	2	-	-	-	-	-	-	-	-	-	-	-	-	-
C112.5	2	-	-	-	-	-	1	-	-	-	-	-	-	-
C112 (Avg.)	2	2	-	-	-	-	1	-	-	-	-	-	-	-

COURSE: BASIC ELECTRICAL ENGINEERING**COURSE CODE: 15ELE25****COURSE OUTCOMES**

Upon completing the course, the student will be able to:

1. Predict the behavior of electrical and magnetic circuits.
2. Select the type of generator / motor required for a particular application.
3. Realize the requirement of transformers in transmission and distribution of electric power and other applications.
4. Practice Electrical Safety Rules & standards.

MAPPING OF COs WITH POs OF BASIC ELECTRICAL ENGINEERING. (15ELE25)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C113.1	2	2	-	-	-	-	-	-	-	-	-	-	--	-
C113.2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
C113.3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
C113.4	-	-	-	-	-	2	-	-	-	-	-	-	-	-
C113 (Avg.)	2	2	-	-	-	2	-	-	-	-	-	-	-	-

COURSE OUTCOMES

Upon completing the course, the student will be able to:

1. Understand the basics of metal joining processes.
2. Demonstrate the knowledge of the principles of metal joining processes and function effectively as an individual to fabricate the components.
3. Identify appropriate techniques, tools and resources to fabricate the components.
4. Perform metal joining processes with due consideration to ethical principles and its impact on health, safety and environment.

MAPPING OF COs WITH POs OF WORKSHOP PRACTICE (15WSL26)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C114.1	2	-	-	-	-	-	-	-	-	-	-	-	1	1
C114.2	2	-	-	-	-	-	-	-	2	-	1	-	1	1
C114.3	2	-	-	-	2	-	-	-	-	-	-	1	1	1
C114.4	2	-	-	-	-	2	1	1	-	-	-	1	1	1
C114 (Avg.)	2	-	-	-	2	2	1	1	2	-	1	1	1	1

COURSE OUTCOMES

Upon completing the course, the student will be able to:

1. Develop skills to impart practical knowledge in real time solution.
2. Understand principle, concept, working and application of new technology.
3. Comparison of results with theoretical calculations.
4. Design new instruments with practical knowledge.
5. Gain knowledge of new concept in the solution of practical oriented problems and to understand more deep knowledge about the solution to theoretical problems.
6. Understand measurement technology, usage of new instruments and real time applications in engineering studies.

MAPPING COs WITH POs OF ENGINEERING PHYSICS LAB. (15PHYL27)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C115.1	3	2	2	2	3	1	-	1	-	3	-	-	--	-
C115.2	3	2	3	1	-	3	1	-	-	-	3	1	-	-
C115.3	3	3	3	3	-	-	-	-	-	2	2	2	-	-
C115.4	3	2	3	3	3	3	2	1	2	3	2	2	-	-
C115.5	3	3	3	3	3	3	3	2	-	2	-	-	-	-
C115.6	3	3	3	2	2	2	1	-	-	-	2	2	-	-
C115 (Avg.)	3	3	3	3	3	3	3	2	2	3	3	2	-	-

COURSE OUTCOMES

Upon completing the course, the student will be able to

1. Have general Knowledge and legal literacy and thereby to take up competitive examinations
2. Understand state and central policies, fundamental duties
3. Understand electoral process based on democratic process and specific provisions
4. Understand powers and functions of municipalities, panchayats and cooperative societies
5. Understand engineering ethics and responsibilities of engineers
6. Have an awareness about basic human rights in India

MAPPING OF COs WITH POs OF CONSTITUTION OF INDIA AND PROFESSIONAL ETHICS (15CIP28)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C116.1	1	-	1	-	-	2	1	1	-	1	1	1	1	-
C116.2	1	-	2	-	-	2	1	1	1	2	1	1	1	-
C116.3	-	-	-	-	-	2	-	1	-	-	-	-	-	-
C116.4	-	-	2	1	-	2	-	2	-	-	-	-	1	-
C116.5	-	-	2	-	-	3	-	3	-	-	-	-	-	1
C116.6	-	-	2	-	-	3	-	1	-	-	-	-	-	-
C116 (Avg.)	1	-	2	1	-	3	1	3	1	2	1	1	1	1

COURSE: ENGINEERING MATHEMATICS-III

COURSE CODE: 15MAT31

COURSE OUTCOMES

Upon completing the course, the student will be able to:

1. **Apply** ordinary differential equations to model engineering phenomena such as electrical circuits, forced oscillation of mass spring and elementary heat transfer
2. **Identify** and **Evaluate** the non-linear D. E. to find solution of different non-linear systems.
3. **Apply** partial differential equations to model problems in fluid mechanics, electromagnetic theory and heat transfer
4. **Apply** multiple integrals to find area, volume, mass and moment of inertia of plane and solid region.
5. **Apply** Laplace transform to determine general or complete solutions to linear ODE

MAPPING OF COs WITH POs OF ENGINEERING MATHEMATICS III (15MAT31)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C201.1	3	3	-	1	-	-	-	-	-	-	-	1	-	-
C201.2	3	3	-	1	-	-	-	-	-	-	-	1	-	-
C201.3	3	3	-	1	-	-	-	-	-	-	-	1	-	-
C201.4	3	3	-	1	-	-	-	-	-	-	-	1	-	-
C201.5	3	3	-	1	-	-	-	-	-	-	-	1	-	-
C201 (Avg.)	3	3	-	1	-	-	-	-	-	-	-	1	-	-

COURSE OUTCOMES

Upon completing the course, the student will be able to,

1. To evaluate the strength of various structural elements subjected to compressive, tensile, shear, bending and torsional forces.
2. To specify suitable material from available sources for use in the field of construction and manufacturing.
3. To evaluate the behavior of structural elements under the action of compound stresses and thus, understand failure concepts.
4. To understand the basic concepts of analysis of circular shafts subjected to torsion.
5. To understand the basic concepts of analysis and design of columns and struts.

MAPPING OF COs WITH POs OF STRENGTH OF MATERIALS (15MAT32)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C202.1	3	3	-	-	-	-	-	-	-	-	-	-	-	1
C202.2	1	-	-	-	-	2	1	1	-	-	-	-	2	-
C202.3	3	3	-	-	-	-	-	-	-	-	-	-	-	2
C202.4	3	3	-	-	-	-	-	-	-	-	-	-	-	2
C202.5	3	3	1	-	-	-	-	-	-	-	-	-	-	2
C202 (Avg.)	2.5	3	1			2	1	1					2	1.75

COURSE OUTCOMES

Upon completing the course, the student will be able to,

1. Possess a sound knowledge of fundamental properties of fluids, fluid continuum and measurement of pressure using suitable measuring devices.
2. Compute and solve problems on hydrostatics, including practical applications
3. Apply principles of mathematics to represent kinematic concepts related to fluid flow
4. Apply fundamental laws of fluid mechanics and the Bernoulli's principle for practical applications
5. Computation of discharge through pipes, notches and weirs

MAPPING OF COs WITH POs OF FLUID MECHANICS(15CV33)

Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO9	PO10	PO11	PO12	PSO1	PSO2
C203.1	3	2	-	1	-	-	-	-	-	-	-	1	1	2
C203.2	3	3	2	-	-	-	-	-	-	-	-	-	1	1
C203.3	3	2	-	-	-	-	-	-	-	-	-	-	1	-
C203.4	2	2	-	-	-	-	-	-	-	-	-	-	1	-
C203.5	3	2	-	-	-	-	-	-	-	-	-	-	1	1
C203 (Avg)	2.8	2.2	2	1	-	-	-	-	-	-	-	1	1	1.33

COURSE OUTCOMES

Upon completing the course, the student will be able to,

1. Possess a sound knowledge of fundamental principles of Geodetic surveying
2. Measure the dimensions and angles in vertical and horizontal plane to arrive at solutions to the basic surveying problems
3. Analyse the geodetic data for survey problems
4. Compute areas and volumes using spatial data and represent 3D data as contours

MAPPING OF COs WITH POs OF BASIC SURVEYING (15CV34)

Course Outcomes	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	PO ₉	PO ₁₀	PO ₁₁	PO ₁₂	PSO ₁	PSO ₂
C204.1	3	-	-	-	-	-	-	-	-	-	-	-	1	-
C204.2	2	2	-	1	-	-	-	-	-	-	-	-	2	-
C204.3	2	3	-	1	-	-	-	-	-	-	-	-	-	2
C204.4	2	3	-	-	-	-	-	-	-	-	-	-	-	2
C204 (Avg)	2.25	2.67	-	1	-	-	-	-	-	-	-	-	1.5	2

COURSE OUTCOMES

Upon completing the course, the student will be able to,

1. Apply the knowledge of geology and its role in Civil Engineering
2. Utilize effectively earthy materials such as mineral, rocks and water in civil engineering practices.
3. Analyze the natural disasters and its mitigation.
4. Assess various structural features and geological tools in ground water exploration, Natural resource estimation and solving civil engineering problems
5. Assess the feasibility of using G I S and Remote sensing techniques in civil engineering practice and impact of quarrying, mining and dams on environment

MAPPING OF COs WITH POs OF ENGINEERING GEOLOGY. (15CV35)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C 205.1	3	1	1	1	-	-	1	-	-	-	-	-	3	-
C205.2	3	-	-	-	-	-	2	-	-	-	-	-	2	1
C205.3	2	2	-	1	-	1	2	-	-	-	-	-	-	2
C205.4	2	1	-	1	-	-	2	-	-	-	-	-	1	1
C205.5	2	1	-	1	1	-	2	-	-	-	-	-	2	2
C205 (Avg)	2.4	1.25	-	1	1	1	1.8	-	-	-	-	-	2	1.5

COURSE OUTCOMES

Upon completing the course, the student will be able to

1. Select suitable materials for buildings.
2. Choose the type of foundation based on site/soil conditions
3. Adopt suitable construction techniques.
4. Adopt suitable repair and maintenance work to enhance durability of buildings.

MAPPING OF COs WITH POs OF BUILDING MATERIALS AND CONSTRUCTION (15CV36)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C 206.1	3	1	1	-	-	1	1	1	-	-	-	-	3	1
C206.2	3	1	1	-	-	1	1	-	-	-	-	-	1	2
C206.3	3	2	2	-	-	1	-	-	-	-	-	-	2	1
C206.4	3	2	-	1	-	2	-	-	-	-	-	-	2	1
C206 (Avg)	3	1.5	1.33	1	-	1.25	1	1		-			2	1.25

COURSE OUTCOMES

Upon completing the course, the student will be able to ,

1. Reproduce the basic knowledge of mathematics and engineering in finding the strength in tension, compression, shear and torsion
2. Identify, formulate and solve engineering problems of structural elements subjected to flexure
3. Evaluate the impact of engineering solutions on the society and also will be aware of contemporary issues regarding failure of structures due to unsuitable materials

**MAPPING OF COs WITH POs OF MATERIAL TESTING LABORATORY
(15CVL37)**

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C207.1	2	-	-	1	-	-	-	-	2	2	1	1	1	1
C207.2	1	1	-	1	-	-	-	-	1	2	1	1	1	-
C207.3	1	1	-	1	2	-	-	-	2	2	1	1	1	1
C207 (Avg.)	1.3	1	-	1	2	-	-	-	1.6	2	1	1	1	1

COURSE: BASIC SURVEY PRACTICE**COURSE CODE: 15 CVL 38****COURSE OUTCOMES**

Upon completing the course, the student will be able to:

1. Apply the basic principles of engineering surveying and for linear and angular measurements.
2. comprehend effectively field procedures required for a professional surveyor.
3. Use techniques, skills and conventional surveying instruments necessary for engineering practice.

MAPPING OF COs WITH POs OF BASIC SURVEY PRACTICE (15CVL38)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C208.1	2	2	-	2	-	-	-	-	-	-	-	-	2	-
C208.2	2	2	-	1		-	-	-	-	-	-	-	2	1
C208.3		2	-	2	3	-	-	-	-	-	-	-	-	1
C208 (Avg)	1.33	2	-	1.66	1	-	-	-	-	-	-	-	1.33	0.66

COURSE OUTCOMES

Upon completing the course, the student will be able to:

- 1. Apply** appropriate single step and multi-step numerical methods to solve first and second order ordinary differential equations arising in flow data design problems.
- 2. Explain** the idea of analyticity, potential fields residues and poles of complex Potentials in field theory and electromagnetic theory.
- 3. Apply** Bessel's functions and Legendre's polynomials for tackling problems arising in continuum mechanics, hydrodynamics and heat conduction.
- 4. Describe** random variables and probability distributions using rigorous statistical methods to analyze problems associated with optimization of digital circuits, information, coding theory and stability analysis of systems.
- 5. Apply** the knowledge of joint probability distributions and Markov chains in attempting engineering problems for feasible random events.

MAPPING OF COs WITH POs OF ENGINEERING MATHEMATICS IV (15MAT41)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C209.1	3	3	-	1	-	-	-	-	-	-	-	1	-	-
C209.2	3	3	-	1	-	-	-	-	-	-	-	1	-	-
C209.3	3	3	-	1	-	-	-	-	-	-	-	1	-	-
C209.4	3	3	-	1	-	-	-	-	-	-	-	1	-	-
C209.5	3	3	-	1	-	-	-	-	-	-	-	1	-	-
C209 (Avg.)	3	3	-	1	-	-	-	-	-	-	-	1	-	-

COURSE OUTCOMES

Upon completing the course, the student will be able to

1. Evaluate the forces in determinate trusses by method of joints and sections.
2. Evaluate the deflection of cantilever, simply supported and overhanging beams by different methods
3. Understand the energy principles and energy theorems and its applications to determine the deflections of trusses and bent frames.
4. Determine the stress resultants in arches and cables.
5. Understand the concept of influence lines and construct the ILD diagram for the moving loads.

MAPPING OF COs WITH POs OF ANALYSIS OF DETERMINATE STRUCTURES

(15CV42)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C210.1	3	-	-	-	-	1	-	-	-	-	-	-	-	-
C210.2	2	2	-	-	-	1	-	-	-	-	-	-	-	2
C210.3	2	2	-	-	-	3	1	-	-	-	-	-	-	2
C210.4	3	2	3	-	-	2	-	-	1	2	-	-	2	3
C210.5	2	2	3	-	-	2	-	-	1	2	-	-	2	3
C210 (Avg.)	2.4	2	3	-	-	1.8	1	-	1	2	-	-	2	2.5

COURSE: APPLIED HYDRAULICS**COURSE CODE: 15 CV 43****COURSE OUTCOMES**

Upon completing the course, the student will be able to,

1. Apply dimensional analysis to develop mathematical modeling and compute the parametric values in prototype by analyzing the corresponding model parameters.
2. Design of open channels of various cross sections including economical channel sections.
3. Apply energy concepts to flow in open channel sections, Calculate energy dissipation, and Compute water profile at different conditions.
4. Design turbines for the given data, and to know their operation characteristics under different operating conditions.

MAPPING OF COs WITH POs OF APPLIED HYDRAULICS (15CV43)

Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO9	PO10	PO11	PO12	PSO1	PSO2
C211.1	3	2	-	1	-	-	-	-	-	-	-	1	1	2
C211.2	3	3	2	-	-	-	-	-	-	-	-	1	1	1
C211.3	3	2	-	-	-	-	-	-	-	-	-	-	1	-
C211.4	3	3	-	-	-	-	-	-	-	-	-	1	1	-
C211 (Avg)	3	2.5	2	1	-	-	-	-	-	-	-	1	1	1

COURSE: CONCRETE TECHNOLOGY**COURSE CODE: 15 CV44****COURSE OUTCOMES**

Upon completing the course, the student will be able to,

1. Relate material characteristics and their influence on microstructure of concrete.
2. Distinguish concrete behaviour based on its fresh and hardened properties.
3. Illustrate proportioning of different types of concrete mixes for required fresh and hardened properties using professional codes.

MAPPING OF COs WITH POs OF CONCRETE TECHNOLOGY(15CV44)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C212.1	3	-	-	-	-	-	-	-	-	-	-	-	2	-
C212.2	2	2	-	-	-	-	-	-	-	-	-	-	1	-
C212.3	2	2	3	-	-	-	-	-	-	-	-	-	-	2
C212 (Avg.)	2.33	1.33	1	-	-	-	-	-	-	-	-	-	1	0.66

COURSE OUTCOMES

Upon completing the course, the student will be able to,

1. Will acquire an understanding of the procedures to determine index properties of any type of soil, classify the soil based on its index properties
2. Will be able to determine compaction characteristics of soil and apply that knowledge to assess field compaction procedures
3. Will be able to determine permeability property of soils and acquires conceptual knowledge about stresses due to seepage and effective stress; Also acquire ability to estimate seepage losses across hydraulic structure
4. Will be able to estimate shear strength parameters of different types of soils using the data of different shear tests and comprehend Mohr-Coulomb failure theory.
5. Ability to solve practical problems related to estimation of consolidation settlement of soil deposits also time required for the same.

MAPPING OF COs WITH POs OF BASIC GEOTECHNICAL ENGINEERING (15CV45)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C213.1	1	2	2	1	-	-	-	-	-	-	-	-	-	1
C213.2	1	2	2	1	-	-	-	-	-	-	-	-	-	2
C213.3	1	2	2	2	-	-	-	-	-	-	-	-	-	2
C213.4	1	2	1	1	-	-	-	-	-	-	-	-	-	2
C213.5	1	2	3	3	-	-	-	-	-	-	-	-	-	3
C213 (Avg)	1	2	2	1.6	-	-	-	-	-	-	-	-	-	2

COURSE OUTCOMES

Upon completing the course, the student will be able to,

1. Apply the knowledge of geometric principles to arrive at surveying problems
2. Use modern instruments to obtain geo-spatial data and analyse the same to appropriate engineering problems.
3. Capture geodetic data to process and perform analysis for survey problems with the use of electronic instruments.
4. Design and implement the different types of curves for deviating type of alignments.

MAPPING OF COs WITH POs OF ADVANCED SURVEYING(15CV46)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C214.1	2	1	-	-	-	-	-	-	-	-	-	-	1	1
C214.2	2	2	1	1	3	1	1	-	-	-	-	-	1	3
C214.3	2	2	1	2	3	1	1	-	-	-	-	-	1	3
C214.4	2	1	2	1	1	1	1	1	-	-	-	-	1	3
C214 (Avg)	2	1.5	1.33	1.33	2.33	1	1	1	-	-	-	-	1	1.75

COURSE OUTCOMES

Upon completing the course, the students will be able to,

1. Properties of fluids and the use of various instruments for fluid flow measurement.
2. Working of hydraulic machines under various conditions of working and their characteristics.

**MAPPING OF COs WITH POs OF HYDRAULIC AND HYDRAULIC MACHINE
LABORATORY (15CVL47)**

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C215.1	2	2	-	2	-	-	-	1	2	2	1	1	1	1
C215.2	2	2	1	2	-	-	-	1	2	2	1	1	1	1
C215	2	2	1	2	-	-	-	1	2	2	1	1	1	1

COURSE OUTCOMES

Upon completing the course, the student will be able to,

1. Identifying the minerals and rocks and utilize them effectively in civil engineering practices.
2. Understanding and interpreting the geological conditions of the area for the implementation of civil engineering projects.
3. Interpreting subsurface information such as thickness of soil, weathered zone, depth of hard rock and saturated zone by using geophysical methods.
4. The techniques of drawing the curves of electrical resistivity data and its interpretation for geotechnical and aquifer boundaries

MAPPING OF COs WITH POs OF ENGINEERING GEOLOGY LABORATORY (15CVL48)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C 216.1	3	2	1	1	-	-	1	-	-	-	-	-	3	-
C216.2	2	-	-	-	-	-	2	-	-	-	-	-	2	1
C216.3	3	2	-	1	-	1	2	-	-	-	-	-	-	2
C216.4	2	1	-	1	1	-	1	-	-	-	-	-	1	1
C216.5	3	1	-	1	1	-	2	-	-	-	-	-	1	2
C216 (Avg)	2.6	1.25	-	1	1	1	1.6	-	-	-	-	-	1.75	1.5

COURSE OUTCOMES

Upon completing the course, the student will be able to:

1. Understand the design philosophy and principles
2. Solve Engineering problems of RC elements subjected to flexure, shear and torsion
3. Demonstrate the procedural knowledge in designs of RC structural elements such as slabs, columns and footings
4. Owns professional and ethical responsibility

MAPPING OF COs WITH POs DESIGN OF RC STRUCTURAL ELEMENTS (15CV51)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C301.1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
C301.2	3	3	2	-	-	3	-	-	-	-	-	-	-	3
C301.3	3	3	3	1	-	-	-	-	-	-	-	-	-	3
C301.4	3	3	3	1	3	3	-	3	-	-	-	-	2	3
C301 (Avg.)	2.5	3	3	1	3	3	-	3	-	-	-	-	2	3

Course outcomes

Upon completing the course, the student will be able to,

1. Determine the moment in indeterminate beams and frames having variable moment of inertia and subsidence using slope deflection method
2. Determine the moment in indeterminate beams and frames of no sway and sway using moment distribution method.
3. Construct the bending moment diagram for beams and frames by Kani's method.
4. Construct the bending moment diagram for beams and frames using flexibility method
5. Analyze the beams and indeterminate frames by system stiffness method.

MAPPING OF COs WITH POs ANALYSIS OF INDETERMINATE STRUCTURES (15CV52)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C302.1	3	3	-	1	-	-	-	-	-	-	-	-	-	1
C302.2	3	3	-	1	-	-	-	-	-	-	-	-	-	1
C302.3	3	3	-	1	-	-	-	-	-	-	-	-	-	1
C302.4	3	3	-	1	-	1	-	-	-	1	-	1	-	1
C302.5	3	3	-	1	-	1	-	-	-	1	-	1	-	1
C302 (Avg.)	3	3	-	1	-	1	-	-	-	1	-	1	-	1

COURSE: APPLIED GEOTECHNICAL ENGINEERING**COURSE CODE: 15CV53****Course outcomes**

Upon completing the course, the student will be able to,

1. Ability to plan and execute geotechnical site investigation program for different civil engineering projects
2. Understanding of stress distribution and resulting settlement beneath the loaded footings on sand and clayey soils
3. Ability to estimate factor of safety against failure of slopes and to compute lateral pressure distribution behind earth retaining structures
4. Ability to determine bearing capacity of soil and achieve proficiency in proportioning shallow isolated and combined footings for uniform bearing pressure
5. Capable of estimating load carrying capacity of single and group of piles

MAPPING OF COs WITH POs APPLIED GEOTECHNICAL ENGINEERING (15CV53)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C303.1	1	-	-	3	-				2	2	1	-	-	3
C303.2	2	3	-	-	-	-	-	-	-	-	-	-	-	-
C303.3	2	3	-	2	-	2	2	-	-	-	-	-	-	1
C303.4	3	3	2	1	-	-	-	-	-	-	-	-	-	2
C303.5	2	3	1	2	-	-	1	-	1	1	2	-	-	3
C303 (Avg.)	2	2.4	0.6	1.6	0	0.4	0.6	0	0.6	0.6	0.6	-	-	1.8

COURSE: COMPUTER AIDED BUILDING PLANNING AND DRAWING**COURSE CODE: 15CV54****COURSE OUTCOMES**

Upon completing the course, the student will be able to:

1. Gain a broad understanding of planning and designing of buildings
2. Prepare, read and interpret the drawings in a professional set up.
3. Know the procedures of submission of drawings and Develop working and submission drawings for building
4. Plan and design a residential or public building as per the given requirements

MAPPING OF COs WITH POs COMPUTER AIDED BUILDING PLANNING AND DRAWING (15CV54)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C304.1	3	2	-	-	3	1	-	-	-	-	-	-	1	3
C304.2	3	2	-	1	3	-	-	-	-	-	-	-	-	3
C304.3	3	3	3	-	3	-	-	2	-	-	-	-	-	3
C304.4	3	3	3	1	3	-	-	-	-	-	-	-	1	3
C304 (Avg.)	3	2.5	3	1	3	1	-	2	-	-	-	-	1	3

COURSE OUTCOMES

Upon completing the course, the student will be able to:

1. Acquires capability of choosing alignment and also design geometric aspects of railway system, runway, taxiway
2. Suggest and estimate the material quantity required for laying a railway track and also will be able to determine the hauling capacity of locomotive
3. Develop layout plan of airport, harbour, dock and will be able to relate the gained knowledge to identify required type of visual and/or navigational aids for the same
4. Apply the knowledge gained to conduct surveying, understand the tunnelling activity

MAPPING OF COs WITH POs RAILWAYS HARBOUR TUNNELING AND AIRPORTS (15CV552)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C305.1	2	-	3	2	-	-	-	-	1	1	-	-	-	2
C305.2	2	2	2	-	-	-	1	-	-	2	-	-	3	2
C305.3	1	1	3	-	-	-	-	-	1	-	1	-	2	3
C305.4	1	2	2	2	-	2	-	-	1	2	1	-	2	2
C305 (Avg.)	1.5	1.67	2.25	2	-	2	1	-	1	1.67	1	-	2.33	2.25

COURSE: REMOTE SENSING AND GIS**COURSE CODE: 15CV563****COURSE OUTCOMES**

Upon completing the course, the student will be able to:

1. Collect data and delineate various elements from the satellite imagery using their spectral signature.
2. Analyze different features of ground information to create raster or vector data.
3. Perform digital classification and create different thematic maps for solving specific problems
4. Make decision based on the GIS analysis on thematic maps.

MAPPING OF COs WITH POs REMOTE SENSING AND GIS (15CV563)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C306.1	1	2	1	1	-	-	1	-	-	2	1	-	1	-
C306.2	2	1	-	1	-	-	-	-	-	1	-	-	1	1
C306.3	1	2	-	1	-	-	1	-	-	-	1	-	2	-
C306.4	1	-	1	-	1	1	1	-	-	-	-	1	-	-
C306.5	-	1	-	1	-	1	-	-	-	-	-	1	1	1
C306 (Avg.)	1.25	1.5	1	1	1	1	1	-	-	1.5	1	1	1.3	1

COURSE: GEOTECHNICAL ENGINEERING LAB**COURSE CODE: 15CVL57****COURSE OUTCOMES**

Upon completing the course, the student will be able to,

1. Physical and index properties of the soil
2. Classify based on index properties and field identification
3. To determine OMC and MDD, plan and assess field compaction program
4. Shear strength and consolidation parameters to assess strength and deformation characteristics
5. In-situ shear strength characteristics (SPT- Demonstration)

MAPPING OF POS WITH COS OF GEOTECHNICAL ENGINEERING LAB (15CVL57)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C307.1	1	-	-	2	-	-	-	-	-	-	-	-	-	1
C307.2	1	-	-	1	-	-	-	-	-	-	-	-	-	-
C307.3	2	2	-	1	-	-	-	-	1	-	-	-	-	-
C307.4	1	2	-	1	-	-	-	-	1	-	-	-	-	1
C307.5	2	2	1	2	-	-	-	-	2	1	1	-	-	2
C307 (Avg.)	1.4	1.2	0.2	1.4	-	-	-	-	0.8	0.2	0.2	-	-	0.8

COURSE OUTCOMES

Upon completing the course, the student will be able to,

1. Conduct appropriate laboratory experiments and interpret the results
2. Determine the quality and suitability of cement
3. Design appropriate concrete mix
4. Determine strength and quality of concrete
5. Test the road aggregates and bitumen for their suitability as road material.
6. Test the soil for its suitability as sub grade soil for pavements.

MAPPING OF COs WITH POs OF CONCRETE AND HIGHWAY MATERIALS LAB (15CVL58)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C308.1	3	-	-	3	-	1	-	-	-	-	-	-	-	-
C308.2	3	-	-	-	-	3	-	-	-	-	-	-	-	-
C308.3	3	3	3	2	-	2	-	2	-	-	-	-	-	3
C308.4	3	-	-	3	-	1	-	-	-	-	-	-	-	-
C308.5	3	-	-	3	-	1	-	-	-	-	-	-	-	-
C308.6	3	-	-	3	-	1	-	-	-	-	-	-	-	-
C308 (Avg.)	3	3	3	2.8	-	1.5	-	2	-	-	-	-	-	3

COURSE OUTCOMES

Upon completing the course, the student will be able to,

1. Understand the construction management process.
2. Understand and solve variety of issues that are encountered by every professional in discharging their duties.
3. Fulfill the professional obligations effectively with global outlook

**MAPPING OF COS WITH POS OF CONSTRUCTION MANAGEMENT &
ENTREPRENEURSHIP (15CV61)**

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C309.1	1	3	-	1	2	-	-	-	2	1	1	1	-	1
C309.2	1	2	-	1	-	3	-	2	1	1	3	1	1	2
C309.3	1	1	1	1	1	2	1	1	2	2	2	1	2	2
C309 (Avg.)	1	2	0.33	1	1	1.67	0.33	1	1.67	1.33	2	1	1	1.67

COURSE OUTCOMES

Upon completing the course, the student will be able to

1. Describe the principles of the limit state method of design and to analyze the behavior of plastic hinge formation and methods of plastic analysis
2. Design bolted and welded connections for both simple and moment resistant connections
3. Design the compression members using simple and built-up sections
4. Design the tension members, simple slab base and gusseted base &
5. Analyze the behavior of flexural members and design of laterally restrained and unrestrained beams

MAPPING OF COS WITH POS OF DESIGN OF STEEL STRUCTURAL ELEMENTS (15CV62)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C310.1	2	1	-	-	-	1	-	-	-	-	-	-	1	2
C310.2	2	2	2	-	-	-	-	-	-	-	-	-	1	2
C310.3	1	3	-	-	-	-	-	-	-	-	-	-	-	2
C310.4	2	2	3	-	-	-	-	-	-	-	-	-	-	3
C310.5	1	2	3	-	-	-	-	-	-	-	-	-	1	2
C310.6	2	2	2	-	-	-	-	-	-	-	-	-	1	3
C310 (Avg.)	1.66	2	1.66	-	-	0.16	-	-	-	-	-	-	0.66	2.33

COURSE: HIGHWAY ENGINEERING**COURSE CODE: 15CV63****COURSE OUTCOMES**

Upon completing the course, the student will be able to,

1. Acquire the capability of proposing a new alignment or re-alignment of existing roads, conduct necessary field investigation for generation of required data.
2. Evaluate the engineering properties of the materials and suggest the suitability of the same for pavement construction.
3. Design road geometrics, structural components of pavement and drainage.
4. Evaluate the highway economics by few select methods and also will have a basic knowledge of various highway financing concepts.

MAPPING OF COS WITH POS OF DESIGN OF HIGHWAY ENGINEERING (15CV63)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C311.1	1	-	-	-	-	-	-	-	2	1	-	1	2	1
C311.2	2	2	-	2	-	-	1	-	2	1	1	2	2	2
C311.3	2	2	2	1	-	-	1	-	1	1	2	2	2	2
C311.4	2	2	-	-	-	-	-	-	-	-	2	-	1	2
C311	1.75	1.5	0.5	0.75	-	-	0.5	-	1.25	0.75	1.25	1.25	1.75	1.75

COURSE: WATER SUPPLY AND TREATMENT ENGG.**COURSE CODE: 15CV64****COURSE OUTCOMES**

Upon completing the course, the student will be able to,

1. Estimate average and peak water demand for a community.
2. Evaluate available sources of water, quantitatively and qualitatively and make appropriate choice for a community.
3. Evaluate water quality and environmental significance of various parameters and plan suitable treatment system.
4. Design a comprehensive water treatment and distribution system to purify and distribute water to the required quality standards.

MAPPING OF COs WITH POs OF WATER SUPPLY AND TREATMENT ENGG.(15CV64)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C312.1	2	2	3	-	-	-	-	-	-	-	-	-	3	1
C312.2	3	3	3	2	-	-	-	-	-	-	-	-	3	2
C312.3	3	3	3	3	-	-	-	-	-	-	-	-	2	3
C312.4	3	3	3	3	-	-	-	-	-	-	-	-	3	3
312 (Avg)	2.75	2.75	3	2.67	-	-	-	-	-	-	-	-	2.75	2.25

COURSE: SOLID WASTE MANAGEMENT**COURSE CODE: 15CV651****COURSE OUTCOMES**

Upon completing the course, the student will be able to,

1. Analyse existing solid waste management system and to identify their drawbacks.
2. Evaluate different elements of solid waste management system.
3. Suggest suitable scientific methods for solid waste management elements.
4. Design suitable processing system and evaluate disposal sites.

MAPPING OF COs WITH POs OF SOLID WASTE MANAGEMENT (15CV651)

Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO9	PO10	PO11	PO12	PSO1	PSO2
C313.1	3	2	1	1	-	3	1	-	2	1	-	1	3	2
C313.2	3	2	1	-	-	2	1	-	-	1	-	-	2	2
C313.3	3	2	2	-	-	2	1	-	-	1	1	-	2	2
C313.4	3	2	2	2	-	1	2	-	1	2	1	-	2	1
C313 (Avg)	3	2	1.5	0.75	-	1.75	1.25	-	0.75	1.25	0.5	0.25	2.25	1.75

COURSE: ENVIRONMENTAL PROTECTION AND MANAGEMENT**COURSE CODE: 15CV662****COURSE OUTCOMES**

Upon completing the course, the student will be able to,

1. Appreciate the elements of Corporate Environmental Management systems complying to international environmental management system standards
2. Lead pollution prevention assessment team and implement waste minimization options
3. Develop, Implement, maintain and Audit Environmental Management systems for Organisations

MAPPING OF COs WITH POs OF ENVIRONMENTAL PROTECTION AND MANAGEMENT (15CV662)

Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO9	PO10	PO11	PO12	PSO1	PSO2
C314.1	-	-	-	-	-	-	2	-	-	-	-	-	-	-
C314.2	-	-	-	-	-	2	-	3	-	-	-	-	-	-
C314.3	-	-	-	-	-	2	-	-	-	2	-	-	-	-
C 314 (Avg)	-	-	-	-	-	2	2	3	-	2	-	-	-	-

COURSE: SOFTWARE APPLICATION LAB**COURSE CODE: 15CVL67****COURSE OUTCOMES**

Upon completing the course, the student will be able to,

1. Use software skills in a professional set up to automate the work and thereby reduce cycle time for completion of the work

MAPPING OF COS WITH POS OF EXTENSIVE SURVEY PROJECT (15CVL67)

Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO9	PO10	PO11	PO12	PSO1	PSO2
C315.1	2	2	-	-	3	-	-	-	1	-	-	2	-	2
C 315	2	2	-	-	3	-	-	-	1	-	-	2	-	2

COURSE: EXTENSIVE SURVEY PROJECT/CAMP**COURSE CODE: 15CVP68**

COURSE OUTCOMES

Upon completing the course, the student will be able to,

1. Apply Surveying knowledge and tools effectively for the projects
2. Understanding Task environment, Goals, responsibilities, Task focus, working in Teams towards common goals, Organizational performance expectations, technical and behavioral competencies.

MAPPING OF COS WITH POS OF EXTENSIVE SURVEY PROJECT (15CV68)

Course Outcome s	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO9	PO10	PO11	PO12	PSO1	PSO2
C316.1	3	2	3	3	3	1	-	-	3	2	2	2	2	2
C316.2	2	2	1	2	1	1	-		1	-	1	1	1	1
C 316	2.5	2	2	2.5	2	1	-	-	2.5	2	1.5	1.5	1.5	1.5

COURSE: MUNICIPAL AND INDUSTRIAL WASTEWATER ENGINEERING

COURSE CODE: 15CV71

Course Outcomes

Upon completing the course, the student will be able to,

1. Acquire capability to design sewer and Sewerage treatment plant.
2. Evaluate degree of treatment and type of treatment for disposal, reuse and recycle.
3. Identify waste streams and design the industrial wastewater treatment plant.
4. Manage sewage and industrial effluent issues.

MAPPING OF COs WITH POs OF MUNICIPAL AND INDUSTRIAL WASTEWATER ENGINEERING (15CV71)

Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO9	PO10	PO11	PO12	PSO1	PSO2
C401.1	3	2	2	1	-	3	2	-	2	1	1	1	3	3
C401.2	3	2	1	-	-	3	2	-	-	1	-	-	2	2
C401.3	3	2	3	-	-	3	2	1	-	1	1	-	2	3
C401.4	3	2	2	2	-	2	2	-	1	2	1	1	2	1
C 401	3	2	2	1.5	-	2.75	2	1	1.5	1.25	1	1	2.25	2.25

COURSE: DESIGN OF RCC AND STEEL STRUCTURES**COURSE CODE: 15CV72**

Course Outcomes

Upon completing the course, the student will be able to,

1. Students will acquire the basic knowledge in design of RCC and Steel Structures
2. Students will have the ability to follow design procedures as per codal provisions and skills to arrive at structurally safe RC and Steel members.

MAPPING OF COs WITH POs OF DESIGN OF RCC AND STEEL STRUCTURES (15CV72)

Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO9	PO10	PO11	PO12	PSO1	PSO2
C402.1	2	1	-	-	-	-	-	-	-	-	-	-	1	2
C402.2	2	2	1	-	-	-	-	-	-	-	-	-	1	2
C 402	2	1.5	1	-	-	-	-	-	-	-	-	-	1	2

COURSE: HYDROLOGY AND IRRIGATION ENGINEERING**COURSE CODE: 15CV73**

Course Outcomes

Upon completing the course, the student will be able to,

1. Understand the importance of hydrology and its components.
2. Measure precipitation and analyze the data and analyze the losses in precipitation.
3. Estimate runoff and develop unit hydrographs.
4. Find the benefits and ill-effects of irrigation.
5. Find the quantity of irrigation water and frequency of irrigation for various crops.
6. Find the canal capacity, design the canal and compute the reservoir capacity

MAPPING OF COs WITH POs HYDROLOGY AND IRRIGATION ENGINEERING (15CV73)

Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO9	PO10	PO11	PO12	PSO1	PSO2
C403.1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
C403.2	1	3	2	2	-	-	1	-	-	-	-	-	-	-
C403.3	1	2	2	1	-	-	-	-	-	-	-	-	-	-
C403.4	-	-	-	-	-	1	2	-	-	-	-	-	-	-
C403.5	1	2	1	1	-	-	1	-	-	-	-	-	1	2
C403.6	1	2	2	1	-	-	1	-	-	-	-	-	1	2
C 403	1.2	2.25	1.75	1.2	-	1	1.2	-	-	-	-	-	1	2

COURSE: GROUND WATER & HYDRAULICS

COURSE CODE: 15CV742

Course Outcomes

Upon completing the course, the student will be able to,

1. Find the characteristics of aquifers.
2. Estimate the quantity of ground water by various methods.
3. Locate the zones of ground water resources.
4. Select particular type of well and augment the ground water storage

MAPPING OF COs WITH POs OF GROUND WATER & HYDRAULICS (15CV742)

Course Outcome s	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO9	PO10	PO11	PO12	PSO1	PSO2
C404.1	2	-	-	-	-	-	-	-	-	-	-	-	1	-
C404.2	2	3	-	1	-	-	-	-	-	-	-	-	2	-
C404.3	2	2	-	1	-	-	-	-	-	-	-	-	-	2
C404.4	2	1	-	-	-	-	-	-	-	-	-	-	-	2
C 404	2	2	-	1	-	-	-	-	-	-	-	-	1.5	2

COURSE: URBAN TRANSPORTATION AND PLANNING

COURSE CODE: 15CV751

Course Outcomes

Upon completing the course, the student will be able to,

1. Design, conduct and administer surveys to provide the data required for transportation planning.
2. Supervise the process of data collection about travel behaviour and analyze the data for use in transport planning.
3. Develop and calibrate modal split, trip generation rates for specific types of land use developments.
4. Adopt the steps that are necessary to complete a long-term transportation plan.

MAPPING OF COs WITH POs OF URBAN TRANSPORTATION AND PLANNING (15CV752)

Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO9	PO10	PO11	PO12	PSO1	PSO2
C405.1	2	1	2	1	-	-	-	-	1	1	-	-	2	2
C405.2	1	2	-	1	-	-	-	-	1	-	-	-	-	2
C405.3	1	1	2	-	-	-	-	-	-	-	-	1	1	2
C405.4	1	-	1	-	-	-	-	-	1	-	-	-	2	2
C 405	1.25	1.33	1.67	1	-	-	-	-	1	1	-	1	1.33	2

COURSE: ENVIRONMENTAL ENGINEERING LABORATORY

COURSE CODE: 15CVL76

Course Outcomes

Upon completing the course, the student will be able to,

1. Acquire capability to conduct experiments and estimate the concentration of different parameters of water, wastewater and air.
2. Compare the result with Standards, Interpret the characteristics and discuss based on the purpose/ designated use of water/wastewater.
3. Decide the type and degree of treatment required for water and wastewater.
4. Identify the parameter to be analyzed for the student project work in environmental stream.

MAPPING OF COs WITH POs OF ENVIRONMENTAL ENGINEERING LABORATORY (15CVL76)

Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO9	PO10	PO11	PO12	PSO1	PSO2
C406.1	1	2	-	2	-	1	-	1	1	-	-	-	2	1
C406.2	-	-	2	3	-	1	-	-	1	2	-	-	2	1
C406.3	-	-	3	3	-	2	3	3	3	3	-	-	-	2
C406.4	-	-	-	-	-	2	2	3	3	3	3	3	1	3
C 406	1	2	2.5	2.67	-	1.5	2.5	2.33	2	3	3	3	1.67	1.75

COURSE: COMPUTER AIDED DETAILING OF STRUCTURES

COURSE CODE: 15CVL77

Course Outcomes

Upon completing the course, the student will be able to,

1. Prepare detailed working drawings

MAPPING OF COs WITH POs OF COMPUTER AIDED DETAILING OF STRUCTURES (15CVL77)

Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO9	PO10	PO11	PO12	PSO1	PSO2
C407.1	3	-	-	1	1	-	-	1	-	3	-	1	-	2
C 407	3	-	-	1	1	-	-	1	-	3	-	1	-	2