Vision of the Institution

To ignite the minds of the students through academic excellence so as to bring about social transformation and prosperity.

Mission of the Institution

- To expand the frontiers of knowledge through Quality Education.
- To provide valued added Research and Development.
- To embody a spirit of excellence in Teaching, Creativity, Scholarship and Outreach.
- To provide a platform for synergy of Academy, Industry and Community.
- To inculcate high standards of Ethical and Professional Behavior.

Vision of CIVIL ENGINEERING Department

To give the nation qualitative Civil Engineers, who can contribute for the construction of a better world with sophisticated infrastructural facilities, eco-friendly houses, modern transportation facilities with a pollution free environment and to protect the precious natural resources of this planet.

Mission of CIVIL ENGINEERING Department

1. To shape the students into good entrepreneurs and to promote self-confidence and all-round development of the student personality through special lectures, practical training programs, field visits and technical seminars.
2. To train the students to acquire generic knowledge in the areas of Civil Engineering
3. To continuously update the physical infrastructure through modernization, thrust area development, R & D and other schemes
4. To generate knowledge base through sustained research and developmental efforts.
5. To produce engineers with self-confidence and overall personality who can be self-employed and generate employment opportunities to fellow engineers and take active part in nation building,
6. Keeping in view the challenges of the future.

Program Educational Objectives (PEOs)

PEO:1

The main objective of the faculty is to guide them by the principles of sustainable development and global inter connectedness with the civil structures, and make them to understand the impact of civil engineering projects how they effects the society and environment in case of failures.

PEO:2

To develop their communication skills(Oral, Written, Visual, Graphic modes) which makes them to participate actively in their communities and profession when working as team leaders or members.

PEO:3

An intensive training is provided to identify, formulate and solving engineering problems in technical areas appropriate CIVIL ENGINEERING.

PEO:4

To make them competent and engaged engineering professionals applying their technical and managerial skills in planning, designing and construction.

Program Outcomes (POs) of CIVIL ENGINEERING Department

Engineering Graduates will be able to:

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs) of CIVIL ENGINEERING Department

PSO 1:

An ability to learn constructional concepts and to implement them in the field work and to make the structural planning in a smarter way.

PSO 2:

To encourage young energetic engineers in technical and software skills in the field of Civil Engineering with innovative thoughts along with existing and future trends in constructional field.

PSO 3 :

The capability to integrate knowledge in constructional field work and to improve skills to become an entrepreneur.

DESIGN AND DRAWING OF STEEL STRUCTURES

UNIT-I

CONNECTIONS:

Riveted connections-definition,rivet strength and capacity ,welded connections :Introduction, Advantages & disadvantages of weldsStrength of welds – Butt and fillet weldsPermissible stresses – IS code requirements. Design of welds fillet welds subjected to moment acting in the plane. Design of welds-Fillet weld subjected to moment acting in the right angles to the plane of jointsDesign of beam to beam connections.Design of beam to column connections.

UNIT – II

BEAMS:

Introduction and allowable stresses in beams.Design requirements as per IS codeDesign of simple and compound beams.Curtailment of flange plates, Beam to Beam connection, Check for deflection, shear, buckling, check for bearing,Design of laterally unsupported beams.

UNIT – III

TENSION MEMBERS AND COMPRESSION MEMBERS:

General design of members subjected to direct tensionand bending -effective length of columns. Slenderness ratio – permissible stresses.

Roof Trusses

Different types of trusses -Design loads – load combinations Is code recommendations, structural details. Design of simple roof trusses involving the design of purlins, members and joints-tubular trusses

UNIT-IV: DESIGN OF COLUMN

Design of compression members, struts etc.Designof lacings and batten.Design principles of eccentrically loaded columns and splicing of columns.

UNIT-V: DESIGN OF COLUMN FOUNDATIONS

Design of slab base and gusseted bases. Column bases subjected to moment

UNIT-VI

PLATE GIRDER

Design consideration-IS code recommendations design of plate girder -welded Curtailment of flange platesstiffeners-splicing and connections.

GANTRY GIRDER:

Impact factors - longitudinal forces, Design of gantry girders.

NOTE: The students should prepare the following plates.

Plate1: Detailing of simple beams

Plate2: Detailing of compound beams including curtailment of flange plates.

Plate3: Detailing of column including lacing and battens.

Plate4: Detailing of column bases – slab base and gusseted base.

Plate5: Detailing of steel roof trusses including particulars at joints.

Plate6: Detailing of plate girder including curtailment, splicing and stiffeners

FINAL EXAMINATION PATTERN:

The end examination paper should consist of part A and part B. Part A consist of 2 questions in design and drawing out of which one question is to be answered. Part B should consist of 5 questions and design out of which 3 are to be answered. Weightagefor Part A is 40% and Part B is 60%.

TEXT BOOKS:

1. Steel structures Design and practice, N.Subramanian,Oxford university press
2. Design of steel structures SS.Bhavikatti I.K International publishing house Pvt.ltd
3. Design of steel structures by S.K.Duggal, Tata Mcgraw Hill, New Delhi

REFERENCES:

1. Comprehensive design of steel structures, by B.C.Punmia, Ashok Kumar Jain and Arunkumarjain, Lakshmi publications, New Delhi **(R1)**
2. Sructural designing steel by Sarwaralamraz, New age international publishers,Newdelhi
3. Design of steel structures M.Ragupathi Tata MC-Graw hill

ENIRONMENTAL ENGINEERING - I

UNIT – I

INTRODUCTION:—Importance and necessity of protected water supply systems –Water borne diseases- Flow chart of public water supply, Role of Environmental Engineer ,Agency activities.

Water Demand And Quantity Estimation: Estimation of water demand for a town or a city, Per capita demand and factors influencing it – types of water demands and its variations –factors affecting water demand, design period, factors affecting design period, population forecast

UNIT – II

SOURCES OF WATER : Lakes ,Rivers , Impounding Reservoirs ,Comparison of Source With reference to Quality ,Quantity and other considerations – Capacity of Storage Reservoirs, Mass curve analysis. Groundwater sources of water, Types of Water bearing formations, springs Wells and Infiltration galleries, Yields from infiltration galleries

Collection And Conveyance Of Water: Factors governing the selection of the intake structure, Types of Intakes, Conveyance of Water: Gravity and Pressure conduits, Types of pipes. Conveyance of water :gravity and pressure conduits, types of pipes ,pipe materials, pipe joints ,design aspects of pipe line ,laying of pipe lines

UNIT –III

QUANTITY and ANALYSIS of WATER: Characteristics of water - physical ,chemical and biological –Analysis of water – physical, chemical ,biological characteristics . Comparison of sources with reference to quality- IS drinking water quality standards and WHO guidelines for drinking water

UNIT –IV

TREATMENT OF WATER : Flowchart of water treatment plant – Treatment Methods: Theory and Design of sedimentation – coagulation – sedimentation with coagulation ,Filtration

UNIT – V

DISINFECTION: Theory of disinfection, chlorination and other disinfecting methods ,softening of water, removal of color and odours - iron and manganese removal –Adsorption –fluoridation and deflouridation –Aeration –Reverse osmosis –Iron exchange- Ultra filtration

UNIT – VI

DISTRIBUTION OF WATER :requirements- method s of distribution system ,layouts of distribution networks , pressures in the distribution , layouts , analysis of distribution networks: hardy cross and equivalent pipe methods-components distribution system : valve such as sluice

valves, air valves ,scour valves and check valves ,high drains ,and water meters ,laying and testing of pipe line s- selection of pipe materials ,pipe joints .

TEXT BOOKS:

1. Environmental engineering by peavey ,rowe and tchobanoglous
2.Enironmental engineering by duggal,s.chand

REFERENCES:

1.Water supply engineering by P.N.Modi

2.Water and waste water technology by Steel

3.Water supply engineering by,B.C.Punmia,.

GEOTECHNICAL ENGINEERING – I

COURSE OBJECTIVES:

1. To enable the student to determine the index properties of the soil and classify it.
2. To impart the concept of seepage of the water through soils and determine the discharge of water through soils.
3. To impart the principles to understand the concept of shear strength of soils.
4. Determine the shear parameters of sands and clays and the areas of their application.
5. To impart the principles of compaction, consolidation of soils and determine the magnitude and the rate of consolidation settlement.

COURSE OUTCOMES

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

1. The students must know the definition of the various quantities related to soil mechanics and establish their inter-relationships.
2. The student should be able to know the methods of determination of the various index properties of the soils and classify the soils.
3. The student should be able to know the importance of the different engineering properties of the soil such as compaction, permeability, consolidation and shear strength and determine them in the laboratory.

The student should be able to apply the above concepts in day-to-day civil engineering practice.

UNIT I

Introduction: Soil formation – soil structure and clay mineralogy – Adsorbed water – Mass-volume relationship –Relative density – Mechanism of compaction – factors affecting – effects of compaction on soil properties - compaction control.

UNIT – II

Index Properties of Soils: Grain size analysis – Sieve and Hydrometer methods – consistency limits and indices – Various Types of soil Classifications – Unified soil classification and I.S. Soil classification.

UNIT – III

Permeability: Soil water – capillary rise – One dimensioned flow of water through soils – Darcy's law- permeability – Factors affecting –laboratory determination of coefficient of permeability –Permeability of layered systems. Total, neutral and effective stresses –quick sand condition – 2-D flow and Laplace's equation - Seepage through soils –Flow nets: characteristics and Uses.

UNIT – IV

Stress Distribution In Soils: Stresses induced by applied loads -Boussinesq's and westergaard's theories for point loads and areas of different shapes– Newmark's influence chart – 2:1 stress distribution method.

UNIT – V

Consolidation: Compressibility of soils – e-p and e-log p curves – Stress history – Concept of consolidation - Spring Analogy - Terzaghi's theory of one-dimensional Consolidation – Time rate of consolidation and degree of Consolidation – Determination of coefficient of consolidation (cv) – Over consolidated and normally consolidated clays.

UNIT – VI

Shear Strength of Soils: Basic mechanism of shear strength - Mohr –Coulomb Failure theories – Stress-Strain behavior of Sands - Critical Void Ratio – Stress-Strain behavior of clays – Shear Strength determination various drainage conditions.

TEXT BOOKS:

1. 'Basic and Applied Soil Mechanics' by Gopal Ranjan and A.S.R.Rao, New Age International

Publishers.

2. 'Soil Mechanics and Foundation Engineering' by V.N.S.Murthy ,CBS publishers.

3. 'Soil Mechanics' by M.Palani Kumar, PHI Learning.

REFERENCES:

1. ‘Fundamentals of Soil Mechanics’ by D.W.Taylor., Wiley.

2. ‘An introduction to Geotechnical Engineering’ by Holtz and Kovacs; Prentice Hall.

WASTE WATER MANAGEMENT

Course objectives:

1. Outline planning and the design of waste water collection, conveyance and treatment systems for a community/town/city.
2. Provide knowledge of characterization of wastewater generated in a community.
3. Impart understanding of treatment of sewage and the need for its treatment.
4. Summarize the appurtenance in sewerage system and their necessity.
5. Teach planning, and design of septic tank and imhoff tank and the disposal of the effluent from these low cost treatment systems.
6. Effluent disposal method and realize the importance of regulation in the disposal of effluents in river

UNIT-I

INTRODUCTION TO SANITATION: System of sanitation and relative merits and demerits, Collection and conveyance of waste water, Sewage and their classification, Estimation of sewage flow and storm, Water drainage, flucation and types of sewers, Hydraulics of sewers and storm drains, Design of sewers, Appurtenances in sewerage, Cleaning and venations of sewers.

UNIT-II

PUMPING OF WASTE WATER: Pumping stations and Locations, Components and types of pumps, Suitability of pumps regarding waste water.
HOUSE PLUMBING: System of plumbing, sanitary fitting and other accessories, One and two pipe system, Design of building drainage.

UNIT-III

SEWAGE CHARACTEISTICS: Sampling and analysis of waste water,Physical, Chemical and Biological Examination,Measurement of BOD and COD and BOD equations.
TREATMENT OF SEWAGE:Primary treatment Screens,Grit chambers and Grease traps, Floatation and Sedimentation,Design of preliminary treatment units,Design of primary treatment units.

UNIT-IV

SECONDARY TREATMENT:Aerobic and anaerobic treatment process and comparison.
SUSPENDED GROWTH PROCESS:Activated sludge process and Principle,Design and Operational problems,Modification of activated sludge process,Oxidation ponds and Aerated lagoons.
ATTACHED GROWTH PROCESS:Trickling filters and Classification,Mechanism of impurities removal,Design, Operation and Maintenance,RBCs, Fluidized bed reactors.

UNIT-V

MISCELLANEOUS TREATMENT METHODS:Nitrification and DE Nitrification,Removal of Phosphates,UASB and Membrane reactors,integrated fixed film reactors,Anaerobic Process: Septic and Imhoff tanks,Working, Principles and Design,Disposal of septic tank effluent.

UNIT-IV

BIO - SOLID MANAGEMENT: Characteristics,Handling and treatment of sludge,anaerobic digestion of sludge.
DISPOSAL OF SEWAGE:Methods of disposal,Disposal into water bodies,Oxygen sag curve,Disposal on land and Sewage sickness.

Text Books:

T1. Waste water Engineering Treatment and Reuse by Metcalf & Eddy, Tata McGraw- Hill edition.

T2. Elements of Environmental Engineering by K.N. Duggal, S.Chand & Company Ltd. New Delhi, 2012.

T3. Environmental Engineering by Howard S.Peavy , Donald R. Rowe, Teorge George Tchobanoglus- Mc-Graw-Hill Book Company, New Delhi, 1985

T4. Wastewater Treatment for pollution control and Reuuse, by soli.J Areivala, sham R Asolekar, Mc-GrawHill, New Delhi; 3rd Edition

T5. Industrial water & wastewater management by KVSG Murali Krishna

References:

R1. Environmental Engineering-II: Sewage disposal and Air pollution Engineering , by Garg, S.K.,: Khanna publishers

R2. Sewage treatment and disposal by Dr.P.N.Modi & Sethi.

R3. Environmental Engineering, by Ruth F. Weiner and Robin Matthews- 4th Edition Elsevier, 2003

R4. Environmental Engineering by D. Srinivasan, PHI Learning private Limited , New Delhi,2011.

COURSE OUTCOMES

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

1. Plan and design the sewerage system.
2. Characterization of sewage.
3. Select the appropriate appurtenances in the sewerage system.
4. Selection of suitable treatment flow for sewage treatment.
5. Identify the critical point of pollution in a river for a specific amount of pollutant disposal into the river.

WATER RESOURCES ENGINEERING-I

SYLLABUS:

UNIT I

Introduction: Engineering hydrology and its applications, Hydrologic cycle,hydrological data-sources of data.

Precipitation:Types and forms, measurement, rain gaugenetwork,presentation of rainfall data, average rainfall, continuity and consistency ofrainfall data, frequency of rainfall, Intensity Duration-Frequency (IDF)curves, Depth-Area-Duration (DAD) curves, Probable MaximumPrecipitation (PMP), design storm.

UNIT-II

Abstractions from Precipitation: Initial abstractions.

Evaporation: factors affecting, measurement, reduction

Evapotranspiration: factors affecting, measurement, control

Infiltration: factors affecting, Infiltration capacity curve, measurement, Infiltration indices.

UNIT-III

Runoff: Catchment characteristics**,** Factors affecting runoff, components,computation-empirical formulae, tables and curves, stream gauging, ratingcurve, flow mass curve and flow duration curve.

Hydrograph analysis: Components of hydrograph, separation of base flow,effective rainfall hydrograph and direct runoff hydrograph, unit hydrograph,assumptions, derivation of unit hydrograph, unit hydrographs of differentdurations, principle of superposition and S-hydrograph methods, limitationsand applications of unit hydrograph, synthetic unit hydrograph.

UNIT-IV

Floods: Causes and effects, frequency analysis- Gumbel's and Log-Pearsontype III distribution methods, Standard Project Flood (SPF) and ProbableMaximum Flood (MPF), flood control methods and management.

Flood Routing: Hydrologic routing, channel and reservoir routing-Muskingum and Puls methods of routing.

UNIT-V

Groundwater: Occurrence, types of aquifers, aquifer parameters, porosity,Specific yield, permeability, transmissivity and storage coefficient, types ofWells, Darcy's law, Dupuit's equation- steady radial flow to wells in confinedAnd unconfined aquifers, yield of a open well recuperation test.Civil Engineering

UNIT VI

Advanced Topics in Hydrology: Rainfall-runoff Modelling, instantaneousunit hydrograph (IUH) - conceptual models - Clark and Nash models, generalhydrological models- Chow - Kulandaiswamy model.

TEXT BOOKS:

1. 'Engineering Hydrology' by Subramanya, K, Tata Mc Graw-HillEducation Pvt. Ltd, (2013), New Delhi.

2. 'Engineering Hydrology' by Jayarami Reddy, P, Laxmi PublicationsPvt. Ltd., (2013), New Delhi

3. 'Applied hydrology 'by Chow V.T., D.R Maidment and L.W. Mays,Tata McGraw Hill Education Pvt. Ltd., (2011), New Delhi.

4. 'Engineering Hydrology 'byOjha C.S.P, R. Berndtsson and P.Bhunya, Oxford University Press, (2010).

REFERENCES:

1. 'Water Resources Engineering', Mays L.W, Wiley India Pvt. Ltd,(2013).

2. 'Hydrology'by Raghunath. H.M., New Age International Publishers,(2010).

3. 'Engineering Hydrology –Principles and Practice'by Ponce V.M.,Prentice Hall International, (1994).

4. 'Hydrology and Water Resources Engineering' by Patra K.C.,Narosa Publications, (2011).

COMPUTER AIDED ENGINEERING DRAWING PRACTICE

Prerequisites:

Familiarity with concepts of engineering drawing and usage of computer.

Course Objectives:

The course is designed to give undergraduate engineering student ability to read and write the language of Engineering Graphics. At the end of the course, students should understand, be able to putdown, use and develop further the key elements of CAED to draught their engineering knowledge.

Course Outcomes:

Upon completion of this course, students should:

- Understand advanced engineering drawing as per the latest BIS standards SP: 46-2003.
- Produce engineering design drawings using a Computer Aided Design (CAD) system.
- Be able to read and interpret drawings.
- Be able to draw & dimension 2D diagrams in standard 2D blueprint form.

Demonstrate the ability to draft a component using different CAD packages

PART A

UNIT –I

PROJECTIONS OF PLANES & SOLIDS : Projections of Regular Solids inclined to both planes – Auxiliary Views. Sections and Sectional views of Right Regular Solids – Prism, Cylinder, Pyramid, Cone – Auxiliary views.

UNIT – II

DEVELOPMENT AND INTERPENETRATION OF SOLIDS: Development of Surfaces of Right Regular Solids – Prisms, Cylinder, Pyramid, Cone and their parts.

Interpenetration of Right Regular Solids – Intersection of Cylinder Vs Cylinder, Cylinder Vs Prism, Cylinder Vs Cone.

UNIT – III

ISOMETRIC PROJECTIONS : Principles of Isometric Projection – Isometric Scale – Isometric Views – Conventions – Isometric Views of Lines, Plane Figures, Simple and Compound Solids – Isometric Projection of objects having non- isometric lines. Isometric Projection of Spherical Parts. Transformation of Projections: Conversion of Isometric Views to Orthographic Views – Conventions.

PERSPECTIVE PROJECTIONS: Perspective View: Points, Lines, Plane Figures and Simple Solids, Vanishing Point Methods (General Method only).

PART B

In Part B, Computer Aided Drafting is introduced

UNIT – IV

Introduction to Computer aided Drafting: Generation of points, lines, curves, polygons, dimensioning. Types of modeling: object selection commands – edit, zoom, cross hatching, pattern filling, utility commands, 2D wire frame modeling, 3D wire frame modeling.

UNIT – V

View points and view ports: view point coordinates and view(s) displayed, examples to exercise different options like save, restore, delete, joint , single option.

UNIT-VI

Computer aided Solid Modeling: Isometric projections, orthographic projections of isometric projections, Modeling of simple solids, Modeling of Machines & Machine Parts.

TEXT BOOKS :

1. Engineering Graphics, K.C. John, PHI Publications.
2. Engineering drawing by N.D Bhatt , Charotar publications

REFERENCES:

1. Mastering Auto CAD 2013 and Auto CAD LT 2013 – George Omura, Sybex.
2. Auto CAD 2013 Fundamentals – Elisemoss, SDC Publications.
3. Engineering Drawing and Graphics using Auto CAD – T. Jeyapoovan, Vikas.
4. Engineering Drawing + Auto CAD – K. Venugopal, V. Prabhu Raja, New Age Publications.
5. Engineering Drawing – RK Dhawan, S Chand Publications.
6. Engineering Drawing – MB Shaw, BC Rama, Pearson.
7. Engineering Drawing – KL Narayana, P Kannaiah, Scitech.
8. Engineering Drawing – Agarwal and Agarwal, Mc Graw Hill.
9. Engineering Graphics – PI Varghese, Mc Graw Hill.
10. Text book of Engineering Drawing with auto-CAD, K.Venkata Reddy/ B.S. publications.

WASTE WATER ENGINEERING LAB

LIST OF EXPERIMENTS

S.No	Name of the Experiment
1.	Determine of PH and Electrical Conductivity (Salinity) of Water and Soil
2.	Determination of Alkalinity/Acidity.
3.	Determination of Chlorides in water and soil.
4.	Determination and estimation of Total solids, organic. Solids, Inorganic Solids and settleable solids by Imhoff cone.
5.	Determination of Iron
6.	Determination of dissolved oxygen with D.O Meter and wrinklers method and BOD.
7.	Determination of Total Phosphorous
8.	Determination of C.O.D.
9.	Determination of total hardness
10.	Determination of Optimum coagulant dose
11.	Determination of Chlorine Demand.
12.	Determination of nitrogen
13.	PhysicalParameters– Temperature,Colour,Turbidity,Taste
14.	Presumptive Coliform Test

Geotechnical Engineering Lab

SR. NO.	NAME OF EXPERIMENT
1	Determination of the moisture content of soil
2	Determination of the specific gravity of the soil using pycnometer
3	Grain size distribution of the soils by Sieve analysis
4	Determination of liquid limit, plastic limit of the soil
5	Determination of Shrinkage limit of soil
6	Determination of coefficient of permeability of the soil by a) Constant head method b) Falling head method
7	Determination of field density of soils by a) Core cutter method b) Sand replacement method
8	Determination of optimum moisture content and maximum dry density of the soil by proctor test

9	Determination of unconfined compressive strength of the cohesive Soil
10	Determination of shear strength parameters of the soil by Direct Shear Test
11	Study of Triaxial Shear Test Apparatus
12	California Bearing Ratio Test