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.

Subject	STRENGTH OF MATERIALS – 1 (19CE4T01)				
Year / Semester	II B.tech/IISem	L	T	P	C
Regulation Year	2020-21	3	0	0	3

Course Learning Objectives:

- To impart preliminary concepts of Strength of Material and Principles of Elasticity and Plasticity Stress strain behavior of materials and their governing laws. Introduce student the moduli of Elasticity and their relations
- To impart concepts of Bending Moment and Shear force for beams with different boundary and loading conditions and to draw the diagrams of variation across the length.
- To give concepts of stresses developed in the cross section and bending equations calculation of section modulus of sections with different cross sections
- The concepts above will be utilized in measuring deflections in beams under various loading and support conditions
- To classify cylinders based on their thickness and to derive equations for measurement of stresses across the cross section when subjected to external pressure.

Course Outcomes:

- The student will be able to understand the basic materials behavior under the influence of different external loading conditions and the support conditions
- The student will be able to draw the diagrams indicating the variation of the key performance features like bending moment and shear forces
- The student will have knowledge of bending concepts and calculation of section modulus and for determination of stresses developed in the beams and deflections due to various loading conditions
- The student will be able to assess stresses across section of the thin and thick cylinders to arrive at optimum sections to withstand the internal pressure using Lame's equation.

SYLLABUS:

UNIT – I

Simple Stresses And Strains And Strain Energy: Elasticity and plasticity – Types of stresses and strains – Hooke's law – stress – strain diagram for mild steel – Working stress – Factor of safety – Lateral strain, Poisson's ratio and volumetric strain – Elastic moduli and the relationship between them – Bars of varying section – composite bars – Temperature stresses.

Strain Energy – Resilience – Gradual, sudden, impact and shock loadings – simple applications.

UNIT – II

Shear Force And Bending Moment: Definition of beam – Types of beams – Concept of shear force and bending moment – S.F and B.M diagrams for cantilever, simply supported and overhanging beams subjected to point loads, u.d.l., uniformly varying loads and combination of these loads – Point of contraflexure – Relation between S.F., B.M and rate of loading at a section of a beam

UNIT – III

Flexural Stresses: Theory of simple bending – Assumptions – Derivation of bending equation: M/I = f/y = E/R, Neutral axis – Determination bending stresses – section modulus of rectangular and circular sections (Solid and Hollow), I, T, Angle and Channel sections – Design of simple beam sections.

UNIT –IV

Shear Stresses: Derivation of formula – Shear stress distribution across various beam sections like rectangular, circular, triangular, I, T angle sections, built up beams, shear centre.

UNIT – V

Deflection Of Beams: Bending into a circular arc – slope, deflection and radius of curvature – Differential equation for the elastic line of a beam – Double integration and Macaulay's methods – Determination of slope and deflection for cantilever and simply supported beams subjected to point loads, - U.D.L. Uniformly varying load. Mohr's theorems – Moment area method – application to simple cases including overhanging beams.

UNIT – VI

Thin And Thick Cylinders: Thin seamless cylindrical shells – Derivation of formula for longitudinal and circumferential stresses – hoop, longitudinal and Volumetric strains – changes in diameter, and volume of thin cylinders – Thin spherical shells.

Thick Cylinders: Introduction Lame's theory for thick cylinders – Derivation of Lame's formulae – distribution of hoop and radial stresses across thickness – design of thick cylinders – compound cylinders – Necessary difference of radii for shrinkage – Thick spherical shells.

TEXT BOOKS:

1. Strength of Materials by Strength of materials, R. K. Rajput, S. Chand & Co, New Delhi

2. Strength of Materials by S. Ramamrutham,

REFERENCES:

1. Strength of Materials by R.K Bansal, Lakshmi Publication

2. Strength of Materials by R. . Subramanian, Oxford University Press, New Delhi

3. Mechanics of Materials by B.C Punmia, Jain and Jain.

Subject	**CONCRETE TECHNOLOGY (19CE4T02)**				
Year / Semester	**II B.tech/IISem**	**L**	**T**	**P**	**C**
Regulation Year	**2020-21**	**3**	**0**	**0**	**3**

Prerequisite: Knowledge on Building materials is necessary.

COURSE OBJECTIVES:

1. To learn the concepts of Concrete production and its behavior in various environments.
2. To learn the test procedures for the determination of properties of concrete.
3. To understand durability properties of concrete in various environments.
4. Knowledge on mix design of concrete
5. Students Will be having Knowledge in emerging technologies of concrete.

UNIT I

CEMENTS &ADMIXTURES: Portland cement – Chemical composition – Hydration, Setting of cement, Fineness of cement, Structure of hydrate cement – Tests for physical properties – Different grades of cements - Admixtures in Cements.

UNIT II

AGGREGATES: Classification of aggregate – Particle shape & texture – Bond, strength & other mechanical properties of aggregates – Specific gravity, Bulk density,

porosity, adsorption & moisture content of aggregate – Bulking of sand – Deleterious substance in aggregate – Soundness of aggregate – Alkali aggregate reaction – Thermal properties – Sieve analysis – Fineness modulus – Grading curves – Grading of fine & coarse Aggregates – Gap graded and well graded aggregate as per relevant IS code – Maximum aggregate size

UNIT III

FRESH CONCRETE: Workability – Factors affecting– Measurement of workability by different tests – Setting times of concrete – Effect of time and temperature on workability –Segregation & bleeding – Mixing and vibration of concrete – Steps in manufacture of concrete–Quality of mixing water, Ready mixed concrete.

UNIT IV

HARDENED CONCRETE: Water / Cement ratio – Abram's Law – Gel space ratio – Nature of strength of concrete –Maturity concept – Strength in tension & compression – Factors affecting strength – Relation between compression & tensile strength - Curing.

TESTING OF HARDENED CONCRETE: Compression tests – Tension tests – Factors affecting strength – Flexure tests –Splitting tests – Non-destructive testing methods – Codal provisions for NDT.

UNIT V

ELASTICITY, CREEP &SHRINKAGE – Modulus of elasticity – Dynamic modulus of elasticity– Poisson's ratio – Creep of concrete – Factors influencing creep – Relation between creep & time – Nature of creep – Effects of creep – Shrinkage –types of shrinkage.

UNIT VI

MIX DESIGN: Factors in the choice of mix proportions – Durability of concrete – Quality Control of concrete – Statistical methods – Acceptance criteria – Proportioning of concrete mixes by BIS method of mix design. Self Compact Concrete and Fiber Reinforced Concrete.

UNIT VI:

SPECIAL CONCRETE : Ready mixed concrete, Shotcrete, Light weight aggregate concrete, Cellular concrete, No-fines concrete, High density concrete, Fibre reinforced concrete, Different types of fibres, Factors affecting properties of F.R.C, Polymer concrete,Types of Polymer concrete, Properties of polymer concrete, High performance concrete –Self consolidating concrete, SIFCON, self healing concrete.

TEXT BOOKS:

1. Concrete Technology by M. S. Shetty. – S. Chand & Co.; 2004
2. Properties of Concrete by A. M. Neville – PEARSON – 4th edition

3. Concrete Technology by A.R. Santha Kumar, Oxford University Press, New Delhi
4. Concrete Technology by M.L. Gambhir. – Tata Mc. Graw Hill Publishers, New Delhi

REFERENCES:

1. Text Book of Concrete Technology, Mahaboob Bhasha, Anuradha publications,
2. Advanced Concrete Technology – by Zongjin Li (Author)
3. Advanced Concrete Technology - Author: John Newman, B S Choo

COURSE OUTCOMES:

1 .Identify and classify the properties of Cement, Aggregate and Concrete.
2 . Understand the behaviour of concrete in various environments.
3 . Illustrate the importance of quality of concrete.
4 . Know how to test the fresh and hardened concrete.
5 . Differentiate the concepts and effects of the Elasticity, Creep & Shrinkage.
6 . Design the concrete mix by IS method.
7 . Understand the behavior of different types of concrete in various loading And environmental conditions.

SUBJECT	**FLUID MECHANICS**				
YEAR/SEMESTER	**II B.Tech/II SEM**	**L**	**T**	**P**	**C**
REGULATION YEAR	**2020-21**	**3**	**-**	**-**	**3**

Course Learning Objectives:

• To understand the properties of fluids and fluid statics

• To derive the equation of conservation of mass and its application

• To solve kinematic problems such as finding particle paths and stream lines

• To use important concepts of continuity equation, Bernoulli's equation and turbulence, and apply the same to problems

• To analyze laminar and turbulent flows

• To understand the various flow measuring devices

• To study in detail about boundary layers theory

Syllabus:

UNIT I

Introduction : Dimensions and units – Physical properties of fluids – specific gravity, viscosity, surface tension, vapour pressure and their influences on fluid motion,

pressure at a point, Pascal's law, Hydrostatic law -atmospheric, gauge and vacuum pressuresmeasurementof pressure. Pressure gauges, Manometers: Differential and Micro Manometers.

UNTI – II

Hydrostatics: Hydrostatic forces on submerged plane, Horizontal, Vertical,

inclined and curved surfaces – Center of pressure.

Fluid Kinematics: Description of fluid flow, Stream line, path line and streak line and stream tube. Classification of flows: Steady, unsteady, uniform, non-uniform, laminar, turbulent, rotational and irrotational flows – Equation of continuity for one, two , three dimensional flows – stream and velocity potential functions, flow net analysis.

UNIT – III

Fluid Dynamics: Surface and body forces – Euler's and Bernoulli's equations for flow along a stream line - Momentum equation and its application – forces on pipe bend.

UNIT – IV

Laminar Flow And Turbulent Flows: Reynold's experiment – Characteristics of Laminar & Turbulent flows, Shear and velocity distributions, Laws of Fluid friction, Hagen-Poiseulle Formula, Flow between parallel plates, Flow through long tubes, hydro dynamically smooth and rough flows.

Closed Conduit Flow: Darcy-Weisbach equation, Minor losses – pipes in series – pipes in parallel – Total energy line and hydraulic gradient line, variation of friction factor with

Reynold's number – Moody's Chart, Pipe network problems, Hazen-Williams formula, Hard-Cross Method,

UNIT – V

Measurement of Flow: Pitot tube, Venturi meter and Orifice meter –classification of orifices, small orifice and large orifice, flow over rectangular, triangular,

trapezoidal and Stepped notches - –Broad crested weirs

.

UNIT – VI

Boundary Layer Theory: Boundary layer (BL) – concepts, Prandtl contribution ,Characteristics of boundary layer along a thin flat plate, Vonkarman momentum integralequation, laminar and turbulent Boundary layers(no deviations)- BL in transition, separationof BL, Control of BL, flow around submerged objects-Drag and Lift- Magnus effect.

Text Books:

1. Fluid Mechanics, P. N. Modi and S. M. Seth, Standard book house, New Delhi

2. A text of Fluid mechanics and hydraulic machines, R. K. Bansal - Laxmi Publications (P)ltd., New Delhi

References:

1. Mechanics of Fluids, Merle C. Potter, David C. Wiggert and Bassem H. Ramadan,

CENGAGE Learning

2. Fluid Mechanics and Machinery, C.S.P. Ojha, R. Berndtsson and P.N. Chandramouli,

Oxford Higher Education.

Course Outcomes:

Upon successful completion of this course the students will be able to:

1.Understand the various properties of fluids and their influence on fluid motion and analyse a variety of problems in fluid statics and dynamics.

2.Calculate the forces that act on submerged planes and curves.

3.Identify and analyse various types of fluid flows.

4.Apply the integral forms of the three fundamental laws of fluid mechanics to turbulent and laminar flow through pipes and ducts in order to predict relevant pressures, velocities and forces.

5.Draw simple hydraulic and energy gradient lines.

6.Measure the quantities of fluid flowing in pipes, tanks and channels.

Subject	**STRUCTURAL ANALYSIS (19CE4T04)**				
Year / Semester	**II B.tech/IISem**	**L**	**T**	**P**	**C**
Regulation Year	**2020-21**	**3**	**0**	**0**	**3**

Course Learning Objectives:

- To give preliminary concepts of assessment of bending moment and shear force in Propped cantilevers
- To give preliminary concepts of assessment of bending moment and shear force in fixed beams and continuous beams due to various loading conditions.
- To impart concepts of Bending Moment and Shear force for beams with different boundary and loading conditions

- The procedure for development of slope deflection equations and moment distribution method to solve application to continuous beams with and without settlement of supports.
- Equip student with concepts of Arches
- The concepts of moving loads and influence lines are imparted for assessment of maximum SF and BM at a given section when loads of varying spans rolling loads of Pratt and Warren trusses. Familiarize Students with Different types of Structures .

Course Outcomes:

Upon successful completion of this course the student will be able to,

- Distinguish between the determinate and indeterminate structures.
- Identify the behaviour of structures due to the expected loads, including the moving loads, acting on the structure.
- Estimate the bending moment and shear forces in beams for different fixity conditions.
- Analyze the continuous beams using various methods -, three moment method, slope deflection method, energy theorems.
- Draw the influence line diagrams for various types of moving loads on beams/bridges.
- Analyze the loads in Pratt and Warren trusses when loads of different types and spans are passing over the truss.
- Analyze structures using Moment Distribution

Syllabus:

UNIT – I

Propped Cantilever: Analysis of propped cantilevers-shear force and Bending moment diagram-Deflection of propped cantilevers.

UNIT - II

Fixed Beams: Introduction to statically indeterminate beams with U. D. load, central point load,eccentric point load, number of point loads, uniformly varying load, couple and combination of loads - shear force and Bending moment diagrams-Deflection of fixed beams including effect of sinking of support, effect of rotation of a support.

UNIT - III

Continuous Beams: Introduction-Clapeyron's theorem of three moments-Analysis of continuous beams with constant moment of inertia with one or both ends fixed-continuous beams with overhang, continuous beams with different moment of inertia for different spans-Effects of sinking of supports-shear force and Bending moment diagrams.

UNIT - IV

Slope-Deflection Method: Introduction, derivation of slope deflection equation, application to continuous beams with and without settlement of supports.

Moment Distribution Method: Stiffness and carry over factors – Distribution factors – Analysis of continuous beams with and without sinking of supports – Portal frames – including Sway-Substitute frame analysis by two cycle.

UNIT – V

Three Hinged Arches: Elastic theory of arches – Eddy's theorem – Determination of horizontal thrust, bending moment, normal thrust and radial shear – effect of temperature. Hinges with supports at different levels.

UNIT – VI

Moving Loads And Influence Lines: Introduction maximum SF and BM at a given section and absolute maximum S.F. and B.M due to single concentrated load, U. D load longer than the span, U. D load shorter than the span, two point loads with fixed distance between them and several point loads-Equivalent uniformly distributed load-Focal length.

INFLUENCE LINES: Definition of influence line for SF, Influence line for BM- load position for maximum SF at a section-Load position for maximum BM at a sections, single point load, U.D. load longer than the span, U.D. load shorter than the span-Influence lines for forces in members of Pratt and Warren trusses.

Text Books:

1. Basic Structural Analysis, C. S. Reddy Tata Mc.Graw-Hill, New Delhi.

2. Analysis of Structures by T.S. Thandavamoorthy, Oxford University Press, New Delhi

3. Analysis of Structures- Vol. I and II, V. N. Vazirani and M. M. Ratwani, Khanna Publishers, New Delhi

4. Structural Analysis, R.C. Hibbeler, Pearson Education, India

5. Theory of Structures – II, B. C. Punmia, Jain & Jain, Laxmi Publications, India.

References:

1. Theory of Structures, B. C Punmia, A. K Jain & Arun K. Jain, Lakshmi Publications

2. Theory of Structures, R.S. Khurmi, S. Chand Publishers.

3. Structural Analysis-I, Hemanth Patel, Yogesh Patel, Synergy Knowledgeware, Mumbai

4. Structural Analysis I Analysis of Statically Determinate Structures, P. N. Chandramouli, Yesdee Publishing Pvt Limited, Chennai

5. Theory of structures, Ramamuratam, Dhanpatrai Publications.

6. Comprehensive Structural Analysis-Vol. I & 2, R. Vaidyanathan & P. Perumal- Laxmi Publications Pvt. Ltd., New Delhi.

Subject	**SOLID MECHANICS LAB (19CE4P01)**				
Year / Semester	**II B.tech/IISem**	**L**	**T**	**P**	**C**
Regulation Year	**2020-21**	**0**	**0**	**3**	**1.5**

COURSE OBJECTIVES:

1. To determine the tension & bending of beam
2. To Conduct the Torsion, Hardness & Spring Test
3. To Conduct Compression test on Concrete
4. To verify Maxwell's Reciprocal theorem on beams

List of Experiments

1. Tension test on Steel bar
2. Bending test on (Steel / Wood) Cantilever beam.
3. Bending test on simple support beam.
4. Torsion test
5. Hardness test
6. Spring test
7. Compression test on wood or concrete
8. Impact test
9. Shear test
10. Verification of Maxwell's Reciprocal theorem on beams.
11. Use of Electrical resistance strain gauges
12. Continuous beam – deflection test.

List of Major Equipment:

1. UTM for conducting tension test on rods
2. Steel beam for flexure test
3. Wooden beam for flexure test
4. Torsion testing machine
5. Brinnell's / Rock well's hardness testing machine
6. Setup for spring tests
7. Compression testing machine
8. Izod Impact machine
9. Shear testing machine
10. Beam setup for Maxwell's theorem verification.
11. Continuous beam setup
12. Electrical Resistance gauge.

Subject	**CONCRETE TECHNOLOGY LABOURATORY (19CE4P02)**				
Year/Semester	**IIBtech/ISem**	**L**	**T**	**P**	**C**
Regulation Year	**2020-21**	**-**	**-**	**3**	**1.5**

Prerequisite: Concrete Technology

LABORATORY OBJECTIVES:

1. To test the basic properties ingredients of concrete, fresh and hardened concrete properties.

LIST OF EXPERIMENTS

EXP1: Determination of normal Consistency and fineness of cement.
EXP2: Determination of initial setting time and final setting time of cement.
EXP3:.Determination of specific gravity and soundness of cement.
EXP4: Determination of compressive o strength of cement.
EXP5: Determination of grading and fineness modulus of coarse aggregate by Sieve analysis.
EXP6: Determination of specific gravity of coarse aggregate
EXP7: Determination of grading and fineness modulus of fine aggregate (sand) By sieve analysis.
EXP8: Determination of bulking of sand.
EXP9: Determination of workability of concrete by compaction factor method.
EXP10: Determination of workability of concrete by slump test
EXP11: Determination of compressive strength of cement concrete.
EXP12: Determination of split tensile strength of concrete.
EXP13: Non-Destructive testing on concrete (for demonstration)

Note: Minimum of 10 Experiments to be done.

LABORATORY OUTCOMES:

1. Capable to Conduct test on Cement determine the basic properties of cement.
2. Able to determine the basic properties of Coarse aggregates and fine aggregates
3. Understand the properties of concrete.
4. Able to determine the Compressive strength of concrete.

REFERENCES:

List of IS Codes for Cement and Concrete

1. IS 269:1989 – Specification for ordinary Portland cement, 33 grade
2. IS 383:1970 – Specification for coarse and fine aggregates from natural sources for concrete
3. IS 455:1989 Specification for Portland slag cement
4. IS 516:1959 Method of test for strength of concrete
5. IS 650:1991 Specification for standard sand for testing of cement

6. IS 1199:1959 Methods of sampling and analysis of concrete
7. IS 1727:1967 Methods of test for pozzolanic materials
8. IS 2386(Part 1):1963 Methods of test for aggregates for concrete: Part 1 Particle size and shape
9. IS 2386(Part 2):1963 Methods of test for aggreegates for concrete: Part 2 Estimation of deleterious materials and organic impurities
10. IS 2386(Part 5):1963 Methods of test for aggregates for concrete : Part 5 Soundness
11. IS 2386(Part 6):1963 Methods of test for aggregates for concrete : Part 6 Measuring mortar making properties of fine aggregates
12. IS 3085:1965 Method of test for permeability of cement mortar and concrete
13. IS 3466:1988 Specification for masonry cement
14. IS 3535:1986 Methods of sampling hydraulic cement
15. IS 3812(Part 2):2003 Specification for pulverized fuel ash Part 2 For use as admixture in cement mortar and concrete
16. IS 5513:1996 Specification for vicat apparatus
17. IS 5514:1996 Specification for apparatus used in Le-Chatelier test
18. IS 5515:1983 Specification for compaction factor apparatus
19. IS 5816:1999 Method of test for splitting tensile strength of concrete.
20. IS 8142:1976 Method of test for determining setting time of concrete by penetration.
21. IS 9284:1979 Method of test for abrasion resistance of concrete

NAME OF THE LAB	**FLUID MECHANICS LAB**				
YEAR/SEMESTER	**II B.Tech/II SEM**	**L**	**T**	**P**	**C**
REGULATION YEAR	**2020-21**	**-**	**-**	**3**	**1.5**

COURSE OBJECTIVES:

1. To calibrate the various discharge measuring instruments for flow through pipes.
2. To determine the coefficient of discharge through small orifice and mouth piece
3. To calibrate the notches for discharge measurement for flow through open channels.
4. To determine the friction factor and losses for flow through pipes
5. To verify the Bernoulli's theorem.

List of Experiments

1. Calibration of Venturimeter & Orifice meter
2. Determination of Coefficient of discharge for a small orifice by a constant head method.
3. Determination of Coefficient of discharge for an external mouth piece by variable head method.
4. Calibration of contracted Rectangular Notch and /or Triangular Notch
5. Determination of Coefficient of loss of head in a sudden contraction and friction factor.
6. Verification of Bernoulli's equation.
7. Impact of jet on vanes
8. Study of Hydraulic jump.
9. Performance test on Pelton wheel turbine
10. Performance test on Francis turbine.
11. Efficiency test on centrifugal pump.
12. Efficiency test on reciprocating pump

.

List of Equipment:

1. Venturimeter setup.
2. Orifice meter setup.
3. Small orifice setup.
4. External mouthpiece setup.
5. Rectangular and Triangular notch setups.

6. Friction factor test setup.

7. Bernoulli's theorem setup.

8. Impact of jets.

9. Hydraulic jump test setup.

10. Pelton wheel and Francis turbines.

11. Centrifugal and Reciprocating pumps.

References:

1. Mechanics of Fluids, Merle C. Potter, David C. Wiggert and Bassem H. Ramadan, CENGAGE Learning

2. Fluid Mechanics and Machinery, C.S.P. Ojha, R. Berndtsson and P.N. Chandramouli, Oxford Higher Education.

COURSE OUTCOMES: At the end of the course the student will be able to

1. Apply the theoretical principles in calibrating the flow measuring devices used in pipes, channels and tanks.
2. Understand the concept of friction factor and losses through pipes.