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COURSE CODE	CATEGORY	COURSE NAME	TEACHING &EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCE402N	DCC	Concrete Technology and Advanced Construction Materials	60	20	20	30	20	2	0	2	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

1. To gain the discrete knowledge of concrete and its technology.
2. The subject involves theoretical and practical approaches which help in exploring the different kinds of concrete & its properties.
3. To enable the students to understand the factors that control the strength behavior of the Concrete.

Course Outcomes (COs):

The students will be able to:

1. Analyze the basic and advanced materials to enhance the properties of concrete.
2. Acquire and apply fundamental knowledge in the fresh and hardened properties of concrete.
3. Identify the functional role of ingredients of concrete and apply this knowledge to mix design philosophy.
4. Design a concrete mix which fulfils the required properties for fresh and hardened concrete.

Syllabus:

UNIT I **6 Hrs.**

Introduction: Classification, properties, grades, advantage & disadvantages of concrete; Ingredients of concrete- Types of cement, aggregates, water; Testing of materials-Cement, Aggregate & Water.

UNIT II **6 Hrs.**

Properties of Fresh and Hardened Concrete: Introduction, Workability- Various test on fresh concrete, Compressive & Tensile strength, Stress and strain Characteristics, Shrinkage and temperature effects, Creep of concrete, Permeability, durability, Thermal properties.

UNIT III **5 Hrs.**

Cement Concrete mix design: Different methods of concrete mix design, Concrete mix design by Indian Standards method, Advanced methods of Compaction and Curing of Concrete.

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			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCE402N	DCC	Concrete Technology and Advanced Construction Materials	60	20	20	30	20	2	0	2	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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UNIT IV **6 Hrs.**

Special Concretes: Light weight concrete, Ready mix concrete, Vacuum concrete, Ferrocement, Fiber reinforced concrete, Polymer concrete composites, Shotcrete, Guniting, Rubble concrete, Resin concrete, Heat resistant concrete, Mass concrete, Temperature control of mass concrete.

UNIT V **7 Hrs.**

Admixtures & Advance Construction Materials: Admixtures – Types & Properties; Uses of fly ash in mortars and concrete, fly ash bricks, Stabilized mud blocks, non-erodible mud plinth; D.P.C. materials; Building materials made by Industrial & Agricultural waste, Foam Concrete, and its uses.

Text Books:

1. Gambhir M.L.; Concrete Technology – Tata McGraw Hill Publishing Co. Ltd., Delhi, Fifth edition, 2017
2. Shetty M.S., Concrete Technology, S. Chand and Co. Pvt. Ltd., New Delhi. Eight Revised edition, 2019
3. Mehta, P.K., Concrete: Microstructure, Properties, and Materials, McGraw Hill Education; Fourth edition, 2017

Reference Books:

1. IS 10262 (2009): Guideline for Concrete mix design proportioning.
2. IS 383 (2016): Coarse and fine aggregate for concrete specifications.
3. Handbooks on Materials & Technology - Published by BMTPC & HUDCO
4. A.M. Neville, Properties of Concrete - Pearson Education, Fifth edition, 2012
5. Dr. R.P. Rethaliya, Concrete Technology, Charotar Publishing House, Second edition, 2018
6. M.L. Gambhir, Building and Construction Materials; Testing and Quality control, McGraw Hill Education, 2017.

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BTCE402N	DCC	Concrete Technology and Advanced Construction Materials	60	20	20	30	20	2	0	2	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

List of Practical's:

1. Determination of fineness of cement by sieve analysis.
2. Determination of consistency of cement, initial and final setting time.
3. Determination of soundness of cement by Le-Chatelier apparatus & Autoclave.
4. Determination of compressive strength of cement.
5. Determination of Fineness modulus of aggregate.
6. Determination of compressive strength of concrete.
7. Determination of workability of concrete by slump cone test.
8. Determination of workability of concrete by compaction factor test.
9. Determination of workability of concrete by Vee Bee Consistometer.
10. Non-destructive test to determine compressive strength of concrete by rebound hammer test

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BTCE404N	DCC	Surveying	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

1. To understand the principles of land and hydrographic surveying.
2. To know the application of surveying in civil engineering projects.

Course Outcomes (COs):

Students at the end of the course will be able to

1. Choose modern survey equipments to measure angles and distances.
2. Extend the knowledge to other civil engineering field.
3. Analyse and solve the problems related to survey.
4. Apply the knowledge of modern technological tools in civil engineering.

Syllabus:

UNIT I **8 Hrs.**

Traversing: Theodolite, Field work checks, traverse computations, latitude and departures, adjustments, computations of co-ordinates, plotting & adjusting or traverse, Omitted measurements, Measurement EDM, Trigonometrical leveling.

UNIT II **9 Hrs.**

Trigonometric Leveling: Introduction; Determination of the level of the top of an object, Determination of the height of the object when the two instrument stations are not in the same vertical plane; Axis signal correction; Difference in elevation by single observation and reciprocal observations.

UNIT III **8 Hrs.**

Tachometry: Tachometric systems and principles, stadia system, uses of analytic lens, tangential system, sublease system, instrument constant, field work reduction, direct-reading tacheometers, use of tacheometry for traversing and contouring.

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BTCE404N	DCC	Surveying	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

9 Hrs.

UNIT IV

Hydrographic Surveying, Aerial Photography & Image Interpretation: Soundings, methods of observations, computations, and plotting. Principles of photographic surveying, aerial photography, tilt and height distortions, Remote sensing, simple equipments, elements of image interpretation, image-processing systems.

8 Hrs.

UNIT V

Geographical Information Systems (GIS): Introductory concepts; Definition and scope; Significance; History of GIS; Spatial Data; Attribute Data; GIS concepts; GIS Operations; Geographic grid; Coordinate systems in GIS; Map Projections: Properties of the spherical earth (area, shape, distance, direction) and different types of map projections – Equivalent, Conformal, azimuthal, and equidistant.

Text Books:

1. B.C. Punmia, Surveying Vol. I, II, III, Laxmi Publications New Delhi, Laxmi Publications; seventeenth edition, 2016.
2. Duggal, Surveying vol I and II, McGraw-Hill; Fifth edition, 2019.
3. Basak; Surveying and Levelling, McGraw Hill Education; 2nd edition, 2017

Reference Books:

1. K.R. Arora, Surveying Vol. I & II, standard book House, New Delhi, 2019.
2. Burrough, Peter A. and McDonnell, Rachael A., Principles of Geographical Information Systems – Spatial Information Systems and Geostatistics., Oxford University Press, Third Edition, 2015.
3. Schuurman, Nadine, GIS – A Short Introduction. Blackwell Publishing, 2004.
4. David P. Paine, James D. Kiser, Aerial Photography and Image Interpretation, John Wiley & Sons, Third Edition, 2012.
5. Avery, T.E., Interpretation of aerial Photographs. Minneapolis, Minnesota: Burgess Publishing Company, 1985.
6. Campbell, James B., Introduction to Remote Sensing, Taylor & Francis, London, Second Edition,1996.

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BTCE404N	DCC	Surveying	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

List of Practical's:

1. Determination of elevation of various points with Dumpy Level by collimation plane method & rise and fall method.
2. Fixing benchmark with respect to temporary bench mark with Dumpy level by fly levelling & check levelling.
3. L section & Cross section of the road (one full size drawing sheet each for L-section & cross section).
4. Measurement of horizontal angles with the help of theodolite by method of repetition.
5. Measurement of vertical angles with theodolite.
6. Determination of horizontal distance between two inaccessible points with theodolite.
7. Locating given building by theodolite traversing (One full size drawing sheet).
8. Determination of elevation of point by trigonometric levelling.
9. Study of planimeter and Determination of area of irregular figure by using planimeter.
10. To give layout for given plan of building.
11. Introduction to Geographical Information System &Creation of Vector Layers in QGIS.
12. Geo-referencing of map in QGIS.

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			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCE405N	DCC	Environmental Engineering - I	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):
The course objective is to build student's knowledge to identify the various sources of water, it's demand and to study the quality of water, it's treatment technique and distribution system.

Course Outcomes (COs):

The students should have:

1. An understanding of importance of water, environmental regulations, and standards; the driving forces behind environmental engineering projects
2. An understanding of water quality criteria, and their relation to public health and environment.
3. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, social, environmental, and economic factors.
4. An ability to develop and conduct appropriate experiments, analyze and interpret data and use engineering judgment to draw conclusions.

Syllabus

UNIT I **9 Hrs.**

Introduction: Introduction. Importance of water, sources of water-surface and ground water sources. Water (prevention and control of pollution) Act – 1974.
Water Demand: Types of water demand, Domestic demand, Industrial demand, Fire Demand etc. Per capita demand, variations in demand, Design period. Factors affecting water consumption. Population forecasting.

UNIT II **9 Hrs.**

Quality of Water: Characteristics of water, physical, chemical, and biological characteristics. Types of microbes, Water borne diseases and their control. Indian standard for drinking water.

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BTCE405N	DCC	Environmental Engineering - I	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Transmission of Water: Intake structure, types and working, pipe materials (merits & demerits)- cast iron, vertically cast and spun pipes, mild steel pipes, asbestos cement, R.C.C and prestressed pipes, pipe joints- spigot and socket joint, flanged joints, coupled and Expansion joints, Valves, Corrosion in pipes - Galvanic, Biological, Stress Corrosion.

8 Hrs.

UNIT III

Treatment of Water: Various types of water treatment (Theory and Applications): Preliminary, secondary, and tertiary. Screening: Course and Fine Screen, Design Criteria.
Sedimentation: Sedimentation tank, types- rectangular and circular settling basins, upward and horizontal flows, detention period, overflow rate, inlet and outlet devices, baffles, Design criteria for sedimentation tank. Coagulation: Theory of coagulation, common coagulants, feeding devices, mixing device, flocculation tank, Dewatering and disposal of sludge.

9 Hrs.

UNIT IV

Filtration: Theory of filtration, description of slow sand and rapid sand gravity filters, their comparison and merits, media characteristics for filters, size and depth, filter gravel and under drains, negative head, and other problems in filtration, back washing of filters.
Disinfection: Mechanisms of disinfection, factors affecting efficiency of disinfection, criteria for a good disinfectant. Chlorination, types of chlorination-plain chlorination, pre chlorination, post Chlorination, double chlorination, super chlorination, dichlorination, Break Point Chlorination, chlorine demand, Doses of chlorine, Determination of Residual Chlorine-O.T. & O.T.A. test, other methods of disinfection in brief ozone, U.V. rays, Iodine, Bromine, Chlorine dioxide. Aeration & Water Softening: Types of hardness, methods of removal

8 Hrs.

UNIT V

Distribution of Water: Introduction, Requirements of a good distribution system, Layouts of distribution networks, Components of distribution system, method of distribution, system of supply, Hardy cross methods for network analysis. Function and types of distribution reservoirs, standpipe, Storage capacity of service reservoir, numerical based of storage capacity. Leak detection, its importance, methods of leak detection, instruments for leak detection.

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BTCE405N	DCC	Environmental Engineering - I	60	20	20	30	20	3	0	2	4

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***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Text Books:

1. Water Supply Engineering by S.K. Garg, Khanna Publishers; 35th edition, 2019.
2. Water Supply Engineering by B.C. Punmia - Laxmi Publications (P) Ltd. New Delhi, Laxmi Publications; Second edition, 2016.

Reference Books:

1. Water supply engineering (volume-I) by Dr. P. N. Modi, Standard Book House, Delhi, 2018.
2. Water Supply & Sanitary Engg. by G.S. Birdi - Laxmi Publications (P) Ltd. New Delhi, 2010.
3. Environmental Engineering by Peavy, H.S., Rowe D.R. and Techobanoglous, Mc Graw Hill, Book Company.
4. Manual of Water Supply and Water Treatment, Ministry of Urban Development, Govt.of India

List of Experiments.

1. Study of sampling techniques for water.
2. Determine the pH value of given sample of water.
3. Determine the acidity of given sample of water.
4. Determine the alkalinity of given sample of water.
5. Determine turbidity in a given sample of water with the help of turbidity meter.
6. Determine the total hardness and calcium hardness in the given sample of water.
7. Determine the concentration of chlorides in the given sample of water.
8. Determine the dissolved oxygen in the given sample of water.
9. Determine the total, dissolved, and suspended solids in the given sample of water.
10. Determine optimum dose of coagulant with the help of jar test apparatus

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BTCE501N	DCC	Structural Analysis - I	60	20	20	0	0	3	1	0	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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Course Educational Objectives (CEOs):
The objectives of the course are to build on the student's knowledge on the theory and application of structures in buildings and to introduce the students to concept of structural stability, methods in structural analysis.

Course Outcomes (COs):
The students should be able to:

1. Distinguish between determinate and indeterminate structure
2. Analysis of Indeterminate structure by various methods
3. Analysis of beams under moving load and to draw influenced line diagram.
4. Analysis of two hinged three hinged arch and suspension bridges.

Syllabus:

UNIT I **10 Hrs.**

Indeterminate Frames - Degree of static and kinematic Indeterminacy of rigid jointed and pin jointed frames for space and plane; Analysis of one-degree indeterminate beams by method of consistent deformations; Analysis of fixed and continuous beam by three moment equation.

UNIT II **9 Hrs.**

Slope Deflection Method – Analysis of beams by slope deflection method with support displacements; Introduction to sway and non-sway frames, sway forces; Analysis of frames with and without sway.

UNIT III **10 Hrs.**

Moment Distribution Method - Analysis of beams by moment distribution method; Analysis of beams by moment distribution method subjected to support displacements; Analysis of non-sway frames by moment distribution method.

UNIT IV **8 Hrs.**

Moving Load and Influence Line Diagram - Maximum shear force and bending moment curves for various types of Rolling loads; Influence line of indeterminate beams and continuous beams by Muller Breslau's Principle.

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BTCE501N	DCC	Structural Analysis - I	60	20	20	0	0	3	1	0	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

UNIT V **8 Hrs.**

Arch and Suspension bridges - Three hinged arches of different shapes; Eddy's Theorem, settlement, and temperature effects; Two Hinged- settlement and temperature effects; Suspension cable; Stiffening girders.

Text Books:

1. B.C Punmia, Ashok Jain., Theory of Structure, Lakshmi Publication Delhi, Thirteenth edition, 2017.
2. S. Ramamrutham, Theory of Structure, Dhanpat Rai Publishing Company Private Limited-New Delhi; Ninth edition (2014).
3. Reddy C.S., Basic Structural Analysis, Tata McGraw Hill Publishing Company, New Delhi, 2017.

Reference Books:

1. Ghali A & Neville M., Structural Analysis - A Unified classical and matrix Approach, Chapman and Hall, New York, 2009.
2. Dr. R. Vaidyanathan, Structural Analysis - Vol. 1 and 2, Laxmi Publications, 2019..
3. Norris C.H., Wilbur J.B. and Utkys. Elementary Structural Analysis, McGraw Hill International

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BTCE407N	DCC	Advance Field Survey Systems	0	0	0	30	20	0	0	4	2

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):
To collect the knowledge about significance of advanced surveying in field measurements in terms of utility and precision of data collection

Course Outcomes (COs):

1. To know about significance of advanced surveying in field measurements in terms of utility and precision of data collection
2. To learn on the principles of electronic distance measurements, Total station and their accuracy
3. To get introduced to the field of geodesy, coordinate systems, Map projections, GPS, its working principles, data collection, data processing and analysis

Syllabus:

UNIT I **5 Hrs.**

Introduction to Advance Surveying - Introduction to advance surveying: Concepts, History, Development, Fundamental Requirements of Advance Surveying, Study of surveying methods and instruments, Maps Projections, and types.

UNIT II **6 Hrs.**

Surveying with GPS - Concepts, Mechanism and Pre requirements of the GPS Survey, Coordinate and time systems, Satellite orbital motions, GPS observables, Estimation procedures, Propagation medium, Methods of post processing GPS data, Instrument handling and setting, Survey data post processing, Survey data applications

UNIT III **6 Hrs.**

Total Station and Survey- Introduction to Total Station: Principle and Function, REM, RDM, Use of Total station for data processing and analysis, Point data collection (Easting, Northing and Height), Electronic Distance Measurement Survey, Area Measurement Survey, Height Measurement Survey, Survey Data Post Processing, Survey Data Applications

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Vishwavidyalaya, Indore	Vishwavidyalaya, Indore		

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COURSE CODE	CATEGORY	COURSE NAME	TEACHING &EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCE407N	DCC	Advance Field Survey Systems	0	0	0	30	20	0	0	4	2

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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UNIT IV **6 Hrs.**

DGPS and Survey - Introduction to Differential GPS (DGPS): Principle, Concepts and Function, Duel and Single Frequency DGPS, RTK and Static Surveys in DGPS, Survey Data Post Processing, Survey Data Applications.

UNIT V **6 Hrs.**

UAV and Survey- History and Development, Concepts, Mechanisms, Functions of UAV.

Text Books:

1. Advanced Surveying by Gopi Satheesh, Sathikumar, N. Madhu, Pearson Education; Second edition, 2017
2. A Text Book on GPS Surveying by Ghosh, Jayanta Kumar, CreateSpace Independent Publication, 2015.
3. Advance Methods and Techniques in Drone Surveying by Dr. E. V. Raghava Rao, Dr. S A Rahim, Prashas Research Consulting, 2022.

Reference Books:

1. Advanced Surveying: Total Station, IS and Remote Sensing by Satheesh, G., Sathikumar, R. and Madhu, N., Pearson Education, Delhi.
2. Global Positioning Systems, Inertial Navigation and Integration, Mohinder, S. G., Lawrence, R. W. and Angus, P. A, John Wiley and Sons Inc., New York.

List of Practical's:

1. Introduction to advance surveying equipments
2. Surveying with GPS
3. Total Station and Survey
4. DGPS and Survey
5. UAV and Survey

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COURSE CODE	CATEGORY	COURSE NAME	TEACHING &EVALUATION SCHEME								
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			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCE403N	DCC	Mechanics of Fluids	60	20	20	30	20	3	0	2	4

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Course Educational Objectives (CEOs):

1. To give fundamental knowledge of fluid, its properties and behavior under various conditions of internal and external flows.
2. To develop understanding about hydrostatic law, principle of buoyancy and stability of a floating body and application of mass, momentum, and energy equation in fluid flow.

Course Outcomes (COs):

1. Understand the broad principles of fluid statics, kinematics, and dynamics.
2. Understand definitions of the basic terms used in fluid mechanics.
3. Be able to apply the continuity, momentum, and energy principles.
4. Be able to apply dimensional analysis.

Syllabus

10 Hrs.

UNIT I

Introduction: Scope and Application of Fluid Mechanics: Physical Properties of Fluids: Density, Specific Weight, Specific Volume, Specific Gravity, Viscosity, Dynamic & Kinematic Viscosity, Newton's Law of Viscosity, Classification of Fluids, Compressibility, Cohesion, Adhesion, Surface Tension, Capillarity, Vapour Pressure.

Equilibrium of Fluids: Pressure at a Point, Pressure Variation, Barometer, Gauges, Manometers, Hydrostatic Forces, Equilibrium of Fluid in Motion, Floatation - Stability of Floating and Submerged Bodies.

09 Hrs.

UNIT II

Kinematics of Fluid Flow: Velocity field, classification of flows, Stream, Path & Streak Lines, Continuity Equation, Stream Function, Velocity Potential, Flow-nets.

Dynamics of Fluid Flow: Euler's Equations of Motion, Bernoulli's equation, Pitot tube, Flow through Openings - Orifices, Mouth pieces etc., Flow through Notches Weirs, Empirical formulae.

08 Hrs.

UNIT III

Dimensional Analysis & Model Study: Units and Dimensions, Dimensional Homogeneity, Buckingham-II-Theorem, Dimensionless Numbers, Principles of Similitude & Applications.

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08 Hrs.

UNIT IV

Flow Through Pipes: Laminar Flow, Flow between Parallel Plates, Measurement of Viscosity, Reynold's experiment, Turbulent flow in Pipes, Solution of Pipe Flow Problems, Losses in Pipes, Measurement of Pipe Flow - Orifice, Nozzle, Bend Meters, Rotameters. Concept of Water Hammer and Surges.

09 Hrs.

UNIT V

Flow Through Open Channels: Classification, Geometric Elements, Continuity, Energy and Momentum Equations, Pressure, Velocity Distributions, Uniform flow, Concept of Normal Depth, Chezy, Manning and other formulae. Best Hydraulic Sections, Specific Energy, Specific Force, Hydraulic Jump and its characteristics, Gradually Varied Flow, Surface Profiles, Dynamic Equations, Measurement of flow in Open Channels.

Text Books:

1. Bansal R.K., Fluid Mechanics and Hydraulic Machines, Laxmi Publication, 2018
2. Rajput R.K., A Textbook of Fluid Mechanics and Hydraulic Machines Standard Book House 2017
3. Modi P.N.& S.M. Seth, Hydraulics and Fluid Mechanics Including Hydraulics Machines, Standard Book House 2019

Reference Books:

1. Subramanya K., Fluid Mechanics and Hydraulic Machines, McGraw Hill Education (India) 2018
2. Garde R.J. and Miraigaoker A.G . Engineering Fluid Mechanics, Scitech Publisher 2017
3. White, Fluid Mechanics McGraw Hill Education (India) 2017

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