S. No.	Course Code	Course Name	Category	Type	Credit	L	T	P
1	CET-201	Construction Materials	PC	Theory	3	3	0	0
2	CET-202	Fluid Mechanics	PC	Theory	4	3	1	0
3	CET-203	Surveying	PC	Theory	3	3	0	0
4	CET-204	Mechanics of Solids	PC	Theory	4	3	1	0
5	CET-205	Engineering Geology	PC	Theory	2	2	0	0
6	MAT-206	Mathematics III	PC	Theory	4	3	1	0
1	CEP-207	Construction Materials Lab	PC	Lab	1	0	0	2
2	CEP-208	Fluid Mechanics Lab	PC	Lab	1	0	0	2
3	CEP-209	Surveying Lab	PC	Lab	1	0	0	2
4	CEP-210	Geology Lab	PC	Lab	1	0	0	2
Total Credits: 20+4=24								

UG/PG: UG	Department: Civil Engineering
Course Code: CET 201	Course Name: Construction Materials
Credit: 3	L-T-P: 3-0-0
Pre-requisite course:	

Syllabus :

Stones- classification, natural bed, tests and preservation of stones; Bricks- raw materials, drying- burning, strength and durability, mortar for masonry, tiles; Timber- classification, seasoning, application, defects in timbers; Cement- chemical composition, manufacturing, hydration, properties of cement compounds, types of cement; Concrete- proportioning, transportation and placing, sampling and acceptance for quality control, fresh concrete: batching, mixing, workability, effect of admixture, influence of aggregate on properties of concrete, hardened concrete: mechanical properties, corrosion, chloride and sulphate attack, water-cement ratio, porosity, curing of concrete, concrete mix design; Steel- types, properties, structural steel selection; Green materials- concept of being green, concrete vs steel vs timber, low e- glasses, high reflectance material, concepts of reduce-reuse and recycle in construction; Advanced materials: newer and improved materials for construction, steel having greater ductility, tensile strength and corrosion resistance, high performance concrete, self compacting concrete, chemicals, epoxies, latexes and bonding agents for repairs, geo-textiles and geo-membranes.

Text books
1. Engineering Materials Rangwala SC
2. Handbook of Concrete Mixes SP23, BIS Delhi
3. Concrete technology by A. M. Neville, Pearson education India
4. Concrete Technology by M.S. Shetty, S. Chand ltd. India
5. Sustainable Construction: Green Building Design and Delivery by C. Kibert, Wiley pub.

Reference Books
1. National Building Code of India, BIS, Delhi.
2. Repair and Rehabilitation of RCC buildings CPWD, Delhi

UG/PG: UG	Department: Civil Engineering
Course Code: CET 202	**Course Name:** Fluid Mechanics
Credit: 4	**L-T- P:** 3-1-0
Version:	**Approved on:**
Pre-requisite course:	

Syllabus

Properties of Fluids, Newtonian and non-Newtonian fluids, Properties of Fluids continued, Examples/Numerical Problems, Fluid Statics-Introduction and Pressure Measurement, Fluid Statics-Hydrostatic Forces on submerged surfaces, Fluid Statics-Buoyancy and Floatation, Problems on Fluid Statics, Flow-Classifications, terminologies, concepts, Flow-Classifications, terminologies, concepts (Contd.), Forces on a Fluid particle and Development of various equations including N.S. equations, Continuity Equation , Energy Equation, Momentum Equation, Problems of Kinematics of Fluid flow, Problems on Continuity equation/ Energy equation/ Momentum equations, Flow Measurements in Pipes, Flow Measurements in Open Channels, Problems on Flow Measurements, Major and Minor Losses in pipe flow/ Darcy-Weisbach equation, Hydraulic Gradient, TEL etc., Analysis Pipe network and simple problems, Notches & Weirs, Orifices & Mouth pieces, Flow through nozzles & Jets, and problems, Dimensional Analysis – Introduction, Dimensional Analysis-Rayleigh's Method, Dimensional Analysis-Buckingham's PI Method, Similitude, Problems on Dimensions Analysis & Similitude, Flow Classification in pipes: Laminar Flow, turbulent flow & Brief Introduction to Boundary Layer Theory, Flow between parallel plates (Plain Poiseuelle Flow/ Couette Flow), Laminar Flow Contd. (Hagen-Poiseuelle Flow), Open Channel Flow, Manning's Formula/ Chezy's formula and basics terminology, Most efficient prismatic channel sections, Open Channel Flow Problems, Review of Course/ Problems.

Books

1. Fluid Mechanics by Streeter, Wylie and Bedford.
2. Principals of Fluid Mechanics by M.K. Natarajan.
3. Fluid Mechanics Thorough Problems by R.J. Garde
4. Fluid Mechanics and Fluid Power Engineering by D.S. Kumar
5. Fluid Mechanics by A.K. Jain.

UG/PG: UG	**Department:** Civil Engineering
Course Code: CET 203	**Course Name:** Surveying
Credit: 3	**L-T-P:** 3-0-0
Pre-requisite course:	

Syllabus

Basic principles, Maps, their scales, referencing system and uses, plotting accuracy; Map coordinate system; projections and their types, Compass and other instruments; Measurement of distances and directions; Theodolite, Temporary and permanent adjustments of Theodolite, Traversing, Adjustment of survey data; Computation of coordinates, Levelling, Tacheometery, Trigonometrical levelling, Introduction to Total Station Plane Table survey, , Contouring, Curves.

Books

1. Surveying Instruments by James M.Anderson & Edward M.Mikhail
2. Surveying Vol. I & II by S.K.Duggal
2. Surveying, by A. M. Chandra, Narosa Pub. House., New Delhi

UG/PG : UG	Department: Civil Engineering
Course Code: CET204	Course Name: Mechanics of Solids
Credit: 4	L-T-P: 3-1-0
Version:	Approved on:
Pre-requisite course:	

Syllabus

Moment of inertia of an area; Polar moment of inertia; Perpendicular and parallel axes theorems; Principal axes and principal moment of inertia; Direct stress and strain; Shear stress and strain; Hook's law; Young's modulus; Modulus of rigidity; Pure shear; Complex stress system; Poisson's ratio; Relationships between elastic constants; Theory of simple bending; Support reaction, shear force and bending moment diagrams in determinate beams and plane frames; Bending and shear stress distribution in beams; Combined bending and direct stresses; Buckling of columns; Introduction to torsion, Method of joints and method of section for analysis of determinate truss.

Books

1. Mechanics of Structures, Vol. I by S.B. Junnarkar & H.J. Shah
2. Strength of Materials by William Nash & Merle Potter
3. Elementary Structural Analysis by J.B. Wilbur & C.H. Norris

UG/PG: UG	Department: Civil Engineering
Course Code: CET 205	Course Name: Engineering Geology
Credit: 2	L-T-P: 2-0-0
Pre-requisite course:	

Syllabus

Physical geology and mineralogy; An introduction to rocks, Classification of rocks and their uses as building and road materials; properties of rock materials, water content, porosity, density and related, point load strength index of rocks, strength of rock materials in triaxial compression, Historical geology; Structural geology: Folds, faults, unconformity etc.; Engineering geology: Geological investigations at dam, tunnel and bridge sites and influence of various structures. Precautions against faulting, folding, bedding planes, joints, cracks, fissures, permeability and ground water condition.

Books

1. Leonard Obert and Wilbur I. Duvall, "Rock Mechanics and Design of Structures in Rock", John Wiley and Sons, Inc., New York.
2. Billings, "Structural Geology".
3. Price, David George, "Engineering Geology: Principles and Practice", Springer.
4. D. Venkat Reddy, "Engineering Geology", Vikas Publishers.
5. Legget, Robert F., and Karrow, Paul F, "Handbook of geology in civil engineering", McGraw-Hill Book Company.

UG/PG: UG	**Department:** Civil Engineering
Course Code: MAT 206	**Course Name:** Mathematics III
Credit: 4	**L-T-P:** 3-1-0
Pre-requisite course:	

Syllabus:

Numerical Methods :

Roots of Algebraic and Transcendental Equations**:** Bisection method, Regula-falsi method, Iteration method, Newton-Raphson method. Interpolation Finite Differences**:** Newton's forward and backward differences interpolation formulae, relations between forward and backward operators, Lagrange's interpolation formula,

Probability and Statistics

Formal concepts: sample space, outcomes, and events; random variable Probability, conditional probability, Bayes Theorem . Specific discrete and continuous distributions, e.g. Binomial, Poisson, Uniform, Exponential, Weibull, Normal distributions. Testing of hypothesis. Chi-Square test as a test of Goodness of fit. Corelation and Regression analysis.

Linear Algebra

Vector Spaces, Sub Spaces, Linear combinations, spanning sets, Basis and Dimensions, Linear Transformations.   Rank and Nullity of linear Transformation. Representation of transformations by matrices. Eigen values and Eigen Vectors. Characterstics Polynomials, minimal polynomials. Cayley Hamilton's theorem

Text Books

1. M.K.Jain,S.R.K. Iyengar and R.K.Jain,Numerical Methods for Scientific and Engineering Computation,Wiley Eastern Limited.
2. J N Sharma, Numerical methods for Engineers and Scientists, 2nd edition Narosa Publishing House New Delhi.
3. Hogg, R.V., & Craig, A.T., Introduction to Mathematical Statistics, 5th Ed.,Prentice-Hall, Inc., Englewood Cliffs, N.J., 1995.
4. Freund, W.J., Mathematical Statistics, 5th Ed., Prentice-Hall, Inc., Englewood Cliffs, N.J., 1994..
5. Linear Algebra – K. Hoffman and R. Kunze.

UG/PG : UG	Department: Civil Engineering
Course Code: CEP 207	Course Name: Construction Materials Laboratory
Credit: 1	L-T-P: 0-0-2
Version:	Approved on:
Pre-requisite course: -	

List of Experiments

1. To determine crushing strength and water absorption of sample of stone.
2. To determine water absorption, compressive strength and efflorescence of bricks
3. To determine water absorption and crushing value of aggregate.
4. To determine fineness, specific gravity and consistency of cement
5. To determine setting times, and comp strength of cement
6. To determine abrasion and wet transverse strength of concrete tiles.
7. To determine workability of concrete in the lab
8. To design concrete mixes and determine compressive strength at 7days and 28 days.

Books

1. Relevant IS codes, BIS, Delhi
2. SP 23 Handbook of concrete mix design, BIS, Delhi.

UG/PG : UG	**Department:** Civil Engineering
Course Code: CEP 208	**Course Name:** Fluid Mechanics Laboratory
Credit: 1	**L-T-P:** 0-0-2
Version:	**Approved on:**
Pre-requisite course:	

List of Experiments

1. Experiments for Hydrostatics principles on a fluid.
2. Experiments on pressure measurement.
3. Experiments to study the flow through a variable area duct and verification of Bernoulli's energy equation.
4. Experiments for determination of coefficient of velocity & discharge for a Mouthpiece.
5. Experiments for determination of coefficient of velocity & discharge for an Orifice.
6. Experiments to determine the discharge coefficient for a V and rectangular notch.
7. Experiments on Flowmeter to determine the coefficient of discharge and coefficient of discharge for an obstruction flow meter namely orifice meter.
8. Experiments on Flowmeter to determine the velocity distribution for pipeline flow with a pitot static probe.
9. Experiments to determine coefficient of discharge for an obstruction flow meter e.g. venturi meter.
10. Experiments to determine the friction coefficients and head losses for pipes of different materials and diameters.
11. Experiments to determine the head loss (minor losses) in a pipe line due to sudden expansion/ sudden contraction/ elbows/ fittings / bend.

Books
1. Fluid Mechanics by Streeter, Wylie and Bedford.
2. Principals of Fluid Mechanics by M.K. Natarajan.
3. Fluid Mechanics Thorough Problems by R.J. Garde
4. Fluid Mechanics and Fluid Power Engineering by D.S. Kumar
5. Fluid Mechanics by A.K. Jain.

UG/PG: UG	Department: Civil Engineering
Course Code: CEP 209	Course Name: Surveying Laboratory
Credit: 2	L-T-P: 0-0-2
Pre-requisite course:	

List of Experiments:
1. Introduction demonstration of surveying equipments
2. Introduction to different distance measurement methods and equipments like chains and tapes
3. Measurement of bearings using Compass
4. Measurement of angles and determination of local attraction using compass
5. Temporary adjustment of Theodolite
6. Measurement of horizontal using Theodolite
7. Measurement of vertical angles using theodolite
8. Compass Traversing
9. Theodolite traversing
10. Differential levelling using Dumpy level
11. Differential levelling using Tilting level
12. Contouring exercise

Books/Manual

1. Departmental Lab Manual

UG/PG: UG	Department: Civil Engineering
Course Code: CEP 210	Course Name: Geology Lab
Credit: 1	L-T-P: 0-0-2
Pre-requisite course:	

List of Experiments

1. Identification of minerals and rocks.
2. Determination of hardness.
3. Determination of strength of rock materials.
4. Determination of water content, porosity, density and related properties of rock materials.
5. Demonstration of structural discontinuities.
6. Geologic Map & Cross Section Field Project.
7. Outcrop Prediction.
8. Attitude Measurements, True and Apparent Dips.

Books

1. Leonard Obert and Wilbur I. Duvall, "Rock Mechanics and Design of Structures in
2. Rock", John Wiley and Sons, Inc., New York.
3. Pamela J. Nelson "Geology Laboratory Manual".
4. David T. Allison," Structural Geology Laboratory Manual".
5. Donal M. Ragan, "Structural Geology: An Introduction to Geometrical Techniques" Cambridge University.