B.Tech 3rd semester Syllabus (Department of Civil Engineering)

B. Tech (Civil Engg.) Semester – III								
Program	Semester	Course code	Course title	L	T	P	Credits	Total Credit/ Sem
CEUG	3	24 1x01	ORGANIZATIONAL BEHAVIOUR AND INDUSTRIAL PSYCHOLOGY	3	0	0	3	
CEUG	3	01 1x03	BUILDING SCIENCE	3	0	3	5	
CEUG	3	01 1x05	ENGINEERING GEOLOGY	3	0	2	4	
CEUG	3	01 1x07	FLUID MECHANICS	3	1	2	5	
CEUG	3	01 1x14	CIVIL ENGINEERING DRAWING	0	0	3	2	
CEUG	3	24 1x06	INDUSTRIAL ECONOMICS & ACCOUNTANCY	3	1	0	4	
CEUG	3	21 1x03	MATHEMATICS – III	3	1	0	4	27
CEUG	3	GE 1x03	EAA III-NSS					

01 1307 FLUID MECHANICS

L-T-P : 3-1-2   **Credit : 05**

Theory:

Introduction, fluid properties: density, viscosity, compressibility, ideal and real fluids.   **Lecture : 04**

1. Hydrostatics; fluid force on plane and curved surfaces, manometry, buoyancy, uniformly accelerated motion.

Lecture : 06

2. Kinematics of fluid flow. Generalized continuity equation, Irrotational motion and solution to Laplace equation. Concept of stream lines, Equipotential Lines, Flow Nets.   **Lecture : 09**

3. Dynamics of fluid flow, Control volume concepts, Euler and Bernoulli's theorems and various application like pivot tube, venturimeter, orifice meter, notches and weir etc; Impulse momentum theory and application.

Lecture : 10

4. Introduction to Navier Stokes Equation. Flow of fluid in closed conduits, Laminar flow of viscous incompressible fluids, Darcy-Weisbach equation, Moody's diagram, and Minor losses Hardy-cross method for pipe networks.   **Lecture : 09**

5. Forces on immersed bodies, concepts of separation, drag force, circulation and lift force. Dimensional Analysis, Model Similitude : Theory and application**.**   **Lecture : 08**

Reference Book/ Text Books:

1. Fluid Mechanics by V.L.Streeter, E.B. and Wylie, McGraw Hill.

2. Fluid Mechanics by Fox & McDonald, John Wiley.

3. Fluid Mechanics by Munson, John Wiley.

4. Fluid Mechanics by F.M. White.

5. Fluid Mechanics with Engineering Application by R.L. Daugherthy, J.B. Franzini, E.J. Finnermore; McGraw Hill, International Ed.

6. I.H. Shames by Fluid Mechanics, PHI.

Practical:

Viscosity, Metacentric height. Orifice meter, Notches, Reynolds number, Impact of jet.

01 1305 ENGINEERING GEOLOGY

L–T–P : 3–0–2   **Credit : 04**

Theory:

1.Basic Geology : General Geology, Mineralogy, Petrology (igneous, sedimentary and metamorphic), Structural geology, Crystallography.   **Lecture : 06**

2.Engineering properties of rocks : Geomorphology (Geomorphic processes weathering, Erosion, Origin and formation of solids).   **Lecture : 06**

3.Geological hazards (landslides, earthquakes and volcanoes), Groundwater, Recent concepts in Geology, Plate tectonics and Sea – floor spreading.   **Lecture : 07**

4. Applied Geology : Geophysical mapping : seismic, resistivity, gravity, radar, geotomography, logging; Geological exploration of an engineering site.   **Lecture : 08**

5. S. I. Desk Study : Site investigation Boreholes: Remote sensing, GIS and GPS: Basic principle and their applications in studying and monitoring Lithosphere, Hydrosphere, Cryosphere and Atmosphere.

Lecture : 08

6.Cut Slopes in rocks and clays; Geological factors affecting the construction of dams, reservoirs and tunnels. Criteria and factors for site selection for Dam, tunnels, waste/radioactive disposal sites, Indian Geology, Outline of stratography of India.   **Lecture : 10**

Text Books:

1. Principles of Engineering Geology by Johnston. R. B. and DeGraff. J. V., John Wiley and Sons, New York.

2. Fundamental of Engineering Geology by Waltham, T., Spon Press, London.

3. A Textbook of Engineering and general Geology by Singh. P., S. K. Kataria and Sons, New Delhi.

4. A Textbook of Geology by Mukherjee P. K., Te world press Pvt. Ltd., Kolkata.

5. Engineering Geology by D V Reddy, Vikash Publishing House Pvt. Ltd.

6. Element of Mineralogy in Engineering Geology by Read, H. H. Rutley's, CBS Publisher.

7. Experiments in Engineering Geology by Gokhale, K. V. G. K. and Roa, D. M., Tata McGraw Hill.

Practical:

Mineralogy, Optics, Study of rocks in hand specimen and under microscope; Topographical maps; Structural

Geological maps; Structural Geological problems; Engineering Geographical maps and Engineering Geological

experiment; Geological fieldwork in and around Patna.

01 1303 BUILDING SCIENCE

L-T-P : 3-0-3   **Credit : 05**

Theory :

1. Building construction : Overview of building process; Introduction to Building Law and IS Codes Different types of loads in Buildings, Load Combinations, IS Code provisions for Loads in Buildings.
Lecture : 7

2. Foundation : shallow foundation (simple calculation)   **Lecture : 5**

3. Super structure : Load bearing masonry, arches, lintels, scaffolding, formwork, Floors and roofs – flat and pitched roofs, concerning, floor finishes staircase and other element of construction; Doors and windows, Building services – vertical transportation, plumbing electrical, Ventilation and Air-conditioning, Energy efficiency, Fire protection, Acoustic and sound insulation. Damp proofing, termite proofing, Carpentry and joinery.
Lecture : 10

4. Concrete : Concrete making materials, properties and types of cement, properties of concrete in fresh and hardened state, durability, spatial coherence.   **Lecture :7**

5. Building stones : Varieties of Indian stones. Quarrying blasting Dressing of stones, characteristics of good building stones, Slate, Marble artificial stones. Stone preservation. Brick and brick masonry; Manufacture properties. Classification and specification, Brick masonry and principles of design of masonry structure.
Lecture : 9

6. Timber steel : Properties and types miscellaneous materials; polymers and plastics .composites and smart materials.   **Lecture : 6**

Text books :

1. Concrete Technology by Neville, A. M. & Brooks, J. J. Pearson Education

2. Civil Engineering Materials by Jackson, N. & Dhir, R. K, ELBS.

3. Building Construction by S. C. Renewal, Character publishing house Amend 1993

4. Civil Engineering Materials, TTTI Chandigarh

5. Construction Technology by Tony Bryan , Wiley

6. Advance Concrete Technology by Zogjin Li , Wiley

Reference Books :

1. "Construction Technology - Volumes 1 and 2, 2nd Edition" by R. Crudely, Longman, UK

2. Building Construction – volumes 1,2,3, and 4, 5th Edition by W. B .McKay. Orient Longman UK 1993

3. "Materials for civil and construction Engineers" by Michael S. Mamlouk and JOHN P. Zaniewski, Addison Longman Inc. USA

4. "Smart structure : Analysis and Design" by A. V. Srinivasan and D. M. McFarland, Cambridge" University UK, 2001.

Practical:

1. Laboratory testing of materials

2. Load Calculations based upon IS Code.

3. Calculation on Brick structure design.

01 1X14 CIVIL ENGINEERING DRAWING

L-T-P : 0-0-3   **Credit : 02**

Practical :

 Understanding of conventional signs and symbols.

- Drawing of various details of residential buildings components : bonds and brickwork, doors, staircases, simple foundations.
- Site and building planning : Site plants, simple one-bedroom house, two-storied house, multi-storied apartment building, framed buildings in steel and concrete.
- Industrial and laboratory buildings.
- Drawing of framework details, floor and roofing systems, masonry, load bearing and non-load bearing walls.
- Working drawings of buildings.
- Planning and layout of large-scale commercial facilities.
- Introduction to AutoCAD.

Text Books :

(1) Building Drawing by B.P. Verma, Khanna Pub., Delhi

(2) Engineering Drawing by N.D. Bhatt.

21 1x03 MATHEMATICS – III

L-T-P: 3-1-0   **Credit : 04**

1. ORDINARY DIFFERENTIAL EQUATIONS &SPECIAL FUNCTIONS : Series solution of differential equations (Frobenious method), Bessel's equation, Its solution, Bessel's function of first & second kind, Recurrence formula, Legendre's equation, Its solution, Legendre polynomials, Rodrigue's formula, Orthogonality of Legendre polynomial.   **Lecture : 10**

2. PARTIAL DIFFERENTIAL EQUATION : Basic concept, 1st & 2nd order linear & quasi – linear partial differential equation, Classification of second order P.D.E., Boundary and initial conditions, wave equations, Separation of variables, use of fourier series, D'Alembert's solution of wave equation, Heat equation, Solution by fourier series.   **Lecture : 10**

3. COMPLEX ANALYSIS - I : Function of complex variables – limit, continuity, differentiability and analyticity of functions Cauchy-Riemann equations, Laplace's equation, harmonic function, Cauchy's integral theorem, Cauchy's integral formula, Taylor's and Laurent series, Residues and its applications to evaluating real integrals. **Lecture : 10**

4. PROBABILITY & STATISTICS : Theorems on probability, including Baye's rule, Random variable – cumulative distribution function, Probability mass function, probability density function, Mathematical expectation, mean variance, moment, generating function & characteristics function, standard probability models Binomials, Poisson exponential, Weibull, normal and lognormal, sampling & sampling distribution, Chi- square and F distributions, large and small sample tests of significance.   **Lecture : 12**

Text Books :

1. Advanced Engineering Mathematics by R.K.Jain & S.R.K. Iyengar

2. Higher engineering mathematics by B.S. Grewal

3. Fundamentals of mathematical statistics by V.K.Kapoor & S.C. Gupta- sultan & sons

References :

1. Advance Engineering Mathematics by E.Kreyszig 8th edition , John Wiley & sons

2. Complex variable and applications by Churchill & Brown –McGraw hill

3. Elements of Partial Differential equation by I.N.Sneddon - McGraw Hill

4. Introduction to Probability & Statistics for engineering by S.M.Ross – John Wiley and Sons, New York.

24 1301 ORGANIZATIONAL BEHAVIOR & INDUSTRIAL PSYCHOLOGY

L-T-P : 3-0-0   **Credit : 03**

1. Concept of organization & organizational Behavior.   **Lecture : 2**

2. (a) Personality : meaning, concept , determinants, personality theories (psychoanalytic Theory, Trait Theory and Self Theory).

(b) Perception-meaning , concept, process of perception, significance of perception.

(c) Leaning- meaning, concept, nature, component of leaning process.

(d) Attitude- meaning, concept, factors in attitude formation, method of finding Employee's attitude.

(e) Value - Meaning and types, value and attitude – similarity and difference.

(f) Motivation- meaning, theory of motivation (Maslow's Theory & Herzberg's Theory).   **Lecture : 11**

3. (a) Group & Group Dynamics - concept, importance, classification of groups , reason for group, formation, group cohesiveness.

(b) Team work :meaning , concept, types , creating, an effective team.   **Lecture : 4**

4. (a) Communication- concept, process, importance, barrier.

(b) Organizational conflict- meaning, concept, types, stages of conflict, resolution of conflict.

(c) Power & politics- nature and concept, Ethics of power & politics, types of power.

(d) Leadership- concept, qualities and functions of a leader, approaches to the analysis of leadership.

Lecture : 8

5. Concept of organization theory, concept of organization structure, form of organizational structure,form of organizational culture.   **Lecture : 7**

6. (a) Organizational effectiveness - concept , approaches, criteria of effectiveness.

(b) Organizational change - meaning, factors in Organizational change, process of planned change.

(c) Organizational Development - concept , need of organizational development, difference between organizational development & management development.   **Lecture : 7**

Text Books :

1. Organizational behavior by Stephen P. Robbin & Seema Sanghi- pearson.

2. Organizational behavior by L.M. Prasad-S Chand & sons.

Reference Book :

1. Organization behavior: managing people and organization by Gregory moorehead – Biztantra.

24 1306 INDUSTRIAL ECONOMICS & ACCOUNTANCY

L-T-P : 3-1-0   **Credit : 04**

1. Various definitions of Economics : Nature of Economic Problem, Relation between science, Engineering. Technology & Economics .   **Lecture : 3**

2. Meaning of demand, Law of Demand, Elasticity of demand, Practical importance & application of the concept of elasticity of Demand.   **Lecture : 5**

3. Meaning of Production and factor of Production : Land, labor, Capital ,Entrepreneur & Organization –their Characteristics law of variable Proportion .Return to Scale.   **Lecture : 5**

4. Cost Analysis : Various concept of cost, Cost function, Short & Long run cost. Concept of Revenue ,Break Even Analysis.   **Lecture : 5**

5. Meaning of Market : Type of market – Perfect completion, Monopoly ,Oligopoly ,Monopolistic competition ,Main feature of these market), Meaning of Supply and Law of Supply, R ole of Demand & Supply in price in prime determination imperfect t competition.   **Lecture : 7**

6. Engineering Economy : (a) Simple and compound interest, Annuities, (b)Basic methods For making economy Studies - (i) Present worth method, (ii) Future worth method (iii)I.R.R method (c) Comparison of alternative – (i) Present worth method, (ii\) Future Worth method (iii) I.R.R method**.**   **Lecture : 7**

7. Accounting: Meaning Scope and Role of accounting , Accounting concept & Convention. Accounting as information System. Recording of transaction in journal and Ledgers. Trial –Balance, Preparation of final Account.   **Lecture : 9**

Text Book :
1. Modern Micro Economics by Theory - H.L.Ahuja-S.Chand
2. Advance Economic Theory by M .L.Jhingan- Konark Publication
3. Engineering Economics by Degarmo , Sullican & Canada –McMillan
4. Double Entry Book Keeping by T.S.Grewal –S .Chand

Reference Books :
1. Stonier & Hague by A test book of Economic Theory-Pearson
2. Industrial Organisation and Engg. Economics by Banga & Sharma