COLLEGE OF TECHNOLOGY AND ENGINEERING

DEPARTMENT OF CIVIL ENGINEERING

1 YEAR BE I SEMESTER SESSION 2017-18

1. Course Code   :   **CE 100**

2. Course Title   :   **ENGINEERING MECHANICS**

3. Credit   :   3(2+1)

4. Theory Lecture Outlines   :

1.	Introduction of condition of equilibrium: Force, system of force, coplanar forces.
2.	*Moment and couples:* Moment and parallel forces, Couples, General conditions of equilibrium
3.	*Moment and couples:* Moment and parallel forces, Couples, General conditions of equilibrium
4.	*Practical Applications:* Levers, Cracked levers, Steel yards. Sagging chains and toggle joints.
5.	*Practical Applications:* Levers, Cracked levers, Steel yards. Sagging chains and toggle joints.
6.	*Centre of Gravity:* Centre of parallel forces, C.G. in some simple cases, C.G. of Solids.
7.	*Moment of Inertia:* Moment of inertia, Radius of gyration and perpendicular axis.
8.	Determination of moment of inertia of simple sections. Mass of moment of inertia.
9.	*Friction:* Introduction, Critical angle of friction, Friction on horizontal planes
10.	Friction on inclined planes, Wedge and block, Screw jacks, Rolling friction.
11.	*Machines:* Introduction, Effects of friction, Loss of work, Reversible and irreversible machine,
12.	Law of machine, Wheel and axle, Differential wheel and axle,
13.	Pulley block, Screw jack, Single and double purchase crab,
14.	Worm and Worm wheel, System of pulleys.
15.	*Frames:* Statically determinate plane frames, Method of joints, Method of sections, Graphical method
16.	*Rectilinear Motion,* Motion under gravity, Projectiles equation of the path, Maximum height attained,
17.	Time of flight, Horizontal range. Angle of projection, Projectile from a given height, Projectile on an inclined plane, Problems.
18.	*Work, Power and Energy:* Work, Power, Work done by torque, Energy,Law of conservation

19.	*Work, Power and Energy:* Work, Power, Work done by torque, Energy,Law of conservation
20.	*Centripetal and centrifugal forces*
21.	*Centripetal and centrifugal forces*
22.	*Laws of motion:* Newton's Law of motion and their explanation
23.	*Laws of motion:* Newton's Law of motion and their explanation
24.	Collision of elastic bodies; Impulse and impulsive force, Principle of conservation of momentum
25.	Collision of elastic bodies; Impulse and impulsive force, Principle of conservation of momentum.
26.	Collision of elastic bodies; Impulse and impulsive force, Principle of conservation of momentum
27.	Loss of kinetic energy during impact.
28.	Loss of kinetic energy during impact.
29.	Numericals
30.	Revision

Text Books/References

1. I.B. Prasad. Engineering Mechanics, Khanna Publisher,
New Delhi.
2. R.S. Khurmi. Applied Mechanics, S. Chand & Company Ltd.,
New Delhi
3. S.B. Junnarkar. Applied Mechanics, Charotar Publishing House,
New Delhi.
4. Saluja. Applied Mechanics, Satya Prakashan, New Delhi.

Head

COLLEGE OF TECHNOLOGY AND ENGINEERING

DEPARTMENT OF CIVIL ENGINEERING
1 YEAR BE I SEMESTER SESSION 2017-18

1. Course Code   : **CE 122**
2. Course Title   : **CIVIL ENGINEERING**
3. Credit   : 2(1+1)
4. Theory Lecture Outlines :

1. Principle and purpose of plane surveying.
2. Chain Surveying: Instrument for chaining, Direct & indirect ranging. Methods of chain along plane & sloping ground
3. Base line, check line, Tie line, Offset, Chain angle & recording in field book.
4. Compass Surveying: True & Magnetic meridian, whole circle bearing & quadrantal bearing system, construction & use of Prismatic & Surveyor Compass, Local attraction.
5. Level and levelling: Definition of various terms used in leveling. Types of Bench mark and their uses. Construction and use of Dumpy and Tilting levels, Leveling staves
6. Temporary adjustment of Dumpy level. Simple, differential leveling, fly leveling, longitudinal and cross sectioning, plotting of profile levelling
7. Determination of level by line of collimation and rise and fall method
8. Arithmetical checks. Level book and record keeping, leveling difficulties and errors in leveling.
9. Stones: Different types, properties of good building stones, common testing of stones, Dressing of stones and use of stones in construction.
10. Bricks: Types, raw materials, identification, composition. Properties and uses of ordinary bricks, fire resistant and chemical resistant bricks.
11. Limes: Definition, sources of lime, slaking of lime, ISI classification of lime.
12. Cement: Chemical composition, types of cement, properties, uses and tests on cement.
13. *Mortars:* Proportioning, properties of ingredients and use of lime, cement and gauge mortars.
14. *Cement Concrete:* Ingredients, common proportions, properties of fresh hardened concrete,Water cement ratio, curing and consolidation of concrete
15. Revision

Text Books/References
1. S.C. Rangwala. Engineering Materials, Charotar Book Stall, Anand.
2. B.C. Punmiya. Surveying & Field Work (Vol. I), Laxmi Publications, New Delhi.

COLLEGE OF TECHNOLOGY AND ENGINEERING

DEPARTMENT OF CIVIL ENGINEERING
2 YEAR B.TECH II SEMESTER SESSION 2017-18

1. Course Code   :   **CE 221**

2. Course Title   :   **STRUCTURAL ANALYSIS**

3. Credit   :   4(3+1)

4. Theory Lecture Outlines   :

    1. *Deflection of Beams:*

    2. Differential relation between load, shear force, bending moment, slope and deflection.

    3. Slope & deflection in determinate beams using double integration method

    4. Macaulay's method

    5. area moment method

    6. conjugate beam method

    7. *Propped Cantilever Beam:*

    8. Analysis of propped cantilever beam

    9. *Fixed Beams & Continuous Beams*

    10. Analysis of fixed beams

    11. continuous beams by three moment theorem

    12. *Springs:* Stiffness of springs

    13. close coiled helical springs

    14. springs in series and parallel

    15. Laminated plate springs

    16. *Theories of Failures:* Concepts of maximum principal stress theory

    17. maximum principal strain theory

    18. maximum shear stress theory

    19. maximum strain energy theory

    20. maximum shear strain energy theory.

    21. *Reciprocal Theorem:*

    22. Maxwell's reciprocal theorem

    23. Betti's theorem.

    24. *Space Frames:*

    25. Analysis of determinate space frames by tension coefficient method.

26.	*Introduction to Energy Methods:*
27.	Strain energy due to bending
28.	shear and torsion
29.	Castigleno's first theorem
30.	Unit load method
31.	deflection of determinate beams
32.	deflection of determinate frames
33.	Numerical
34.	Numerical
35.	Numerical
36.	Numerical
37.	Numerical
38.	Numerical
39.	Numerical
40.	Revision
41.	Revision
42.	Revision
43.	Revision
44.	Revision
45.	Revision

Suggested Books & References

1.   Fedinard L. Singer & Andrew Pytel, "Strength of Materials".

2.   Fenner, "Mechanics of Solids".

3.   Punamia B.C. "Strength of Material & Mechanics of Structures".

4.   Junarkar,"Mechanics of structures vol. I & II".

Head

COLLEGE OF TECHNOLOGY AND ENGINEERING

DEPARTMENT OF CIVIL ENGINEERING
2 YEAR BE II SEMESTER SESSION 2017-18

1. Course Code   :   **CE 222**

2. Course Title   :   **HYDRAULICS & HYDRAULIC MACHINES**

3. Credit   :   4(3+1)

4. Theory Lecture Outlines   :

    1.   *Flow in Pipes:*

    2.   Laminar flow, Reynolds experiment

    3.   transition from laminar to turbulent flow.

    4.   Turbulent Flow (Laws of fluid friction factor, loss of head due to friction and other causes).

    5.   Hydraulic gradient total energy line

    6.   Chezy's and Mannings's formula

    7.   Flow through parallel pipes and pipes in series

    8.   Power transmission through pipe, condition for maximum power

    9.   Elementary water hammer concept.

    10.   *Flow Through Open Channels:*

    11.   Steady and uniform flow in open channel

    12.   , Discharge formulae of Chezy, Manning and Bazin.

    13.   Most economic section for rectangular, trapezoidal and circular channels.

    14.   Non-Uniform Flow in open channel. Specific energy of flow.

    15.   Alternate depths. Critical depth in prismatic channels.

    16.   Rapid, critical and sub critical flow

    17.   Mild, steep and critical slopes

    18.   Classification of surface curves in prismatic channels and elementary computation.

    19.   *Hydraulic jump:* Hydraulic jump in rectangular channels, conjugate or sequent depths.

    20.   *Laminar Flow:* Relation between shear & pressure gradient.

    21.   Flow between plates & pipes.

    22.   Equations for velocity distribution, and shear distribution, pressure difference.

    23.   *Turbulent Flow in Pipes:* Theories of Turbulence,

    24.   Nikuradse's Experiments Hydro-dynamically smooth & rough boundaries

25.	Laminar sublayer, Equations of velocity distribution and friction coefficient,
26.	Stanton Diagram, Moddy's diagram.
27.	*Impact of Free Jets:*
28.	Impact of a jet on a flat or a curved vane,
29.	Impact of a jet on a moving and stationary vane
30.	*Centrifugal Pumps and Reciprocating pumps:*
31.	Elementary concept of single and multistage pumps
32.	Efficiencies, Specific speed, characteristic curves.
33.	*Turbines:*
34.	Reaction and Impulse turbines,
35.	specific speed, Mixed flow turbines
36.	Elementary concept of Pelton wheel turbine
37.	Francis turbine,
38.	Propeller turbine and Kaplan turbine
39.	Efficiency & characteristics of turbines
40.	Numerical
41.	Numerical
42.	Numerical
43.	Revision
44.	Revision
45.	Revision

Suggested Books & References
1. Modi & Seth, 'Hydraulics and Hydraulic Machines.
2. Dr. K.R. Arora, 'Fluid Mechanics, Hydraulics and Hydraulic Machines

Head

1. Course Code : **CE 223**

2. Course Title : **BUILDING PLANNING & DESIGN**

3. Credit : 4(3+1)

4. Theory Lecture Outlines :

1. *Introduction:* Type of building**,**

2. criteria for site selection, site plan.

3. *Planning of Building:* Planning, regulations and bylaws.

4. Regulation regarding

5. : lines of building frontages, built up area of buildings,

6. open space around buildings and their heights,

7. provision to size, height and ventilation of rooms and apartments and sanitary provisions.

8. *Principal of Planning:*

9. Factors affecting planning (aspect, prospect, privacy, grouping, roominess, furniture requirement, sanitation, flexibility, circulation, elegance, economy etc).

10. *Functional Requirements:*

11. Functional requirement of a building and its components.

12. Structural component of a building.

13. *Orientation of Buildings:*

14. Factors affecting orientation,

15. Orientation criteria under Indian condition.

16. Sun diagram and relevant details.
    Ventilation in Buildings:

17. *Ventilation in Buildings:*

18. Necessity of ventilation

19. factors affecting ventilation

20. Functional requirements of a good ventilation system

21. systems of ventilation

22. *Air Conditioning of Buildings:*

23. Purpose, classification,

24. principle and systems of air conditioning.

25. *Thermal Insulation of Buildings:*

26. Objectives, advantages, general principle and method of thermal insulation.

27. *Energy Efficient Buildings:*

28. Concepts of Energy Efficient Buildings

29. *Acoustic:* Definition

30. velocity, frequency

31. intensity & reflection of sound, reverberation

32. absorption of sound, Sabin's equation.

33. Types of absorbent material.

34. Noise & its effect.

35. Types & transmission of noise.

36. Sound insulation of walls & floors.

37. *Fire Protection in Building:*

38. General, causes & effect of fire.

39. Characteristics of fire resisting material.

40. Fire resisting properties of common building material.

41. General rules for fire resisting buildings.

42. Concept of strong room construction

43. Revision

44. Revision

45. Revision

Suggested Books & References

1 Rangwala, S.C., 'Engineering Materials', Charotar Book Stall, Anand,.

2 Arora, S.P. and Bindra, 'Building Construction', Dhanpat Rai & Sons, New Delhi.

3 Awaasthy, S.N., 'Building Construction', Publishing House, Bhopal

Head

1. Course Code   :   **CE 224**

2. Course Title   :   **CONCRETE TECHNOLOGY**

3. Credit   :   4(3+1)

4. Theory Lecture Outlines   :

1. *Cement:* Constituents of cement and their role,

2. composition of cement (Bogue's equation)

3. hydration of cement, structure of hydrated cement,

4. heat of hydration. Tests of cement as per IS code.

5. *Aggregates:* Classification, properties and grading of aggregates.

6. Tests on aggregates as per IS code.

7. *Admixture in Concrete:*

8. Chemical and mineral admixtures (their types and use under different conditions).

9. Use of fly ash and silica fume in concrete

10. *Concrete:* Grade of concrete,

11. proportioning of ingredients,

12. water content and its quality for concrete,

13. water/cement ratio and its role.

14. *Concrete Mix Design:*

15. Controlling factors and Design of mix by IS method.

16. *Properties of Fresh Concrete:*

17. workability, air content, flowability,

18. factors affecting and methods to determine these properties.

19. Standard tests on fresh concrete as per IS code.

20. Acceptance Criteria. Quality control for concrete

21. *Properties of Hardened Concrete:*

22. Strength, permeability

23. creep and shrinkage, factors influencing these properties.

24. Standard tests on fresh and hardened concrete as per IS code.

25. *Concrete Handling in Field:*

26.	Introduction to mixing & batching methods,
27.	placing, transportation, compaction and curing methods.
28.	*Form Work:*
29.	Requirements, loads on formwork, type & method to provide centering and shuttering for volumes,
30.	beams, slabs, walls and staircase, slip and moving formwork,
31.	Indian standard on formwork
32.	*High Strength Concrete*
33.	Production, properties & application
34.	*Special Concretes:*
35.	Introduction to: High performance Concrete,
36.	Light weight concrete,
37.	High density concrete,
38.	Fibre reinforced concrete,
39.	Polymer concrete composites,
40.	Self Compacting Concrete – Ready mix concrete
41.	Revision
42.	Revision
43.	Revision
44.	Revision
45.	Revision

Suggested Books & References

1. Shetty M.S. "Concrete Technology"

2. Mehta PK & Monteriro P.J.M., "Concrete Microstructure, Properties and Materials".

3. Neville A M. & Brooks J.J. "Concrete Technology"

Head

1. Course Code   :   **CE 225**

2. Course Title   :   **SURVEYING-I**

3. Credit   :   4(3+1)

4. Theory Lecture Outlines   :

1. *Measurement of Distances:*

2. Plan and Maps (selection of scale),

3. Error in chaining/tape and various precautions

4. Corrections to tape measurements.

5. Degree of accuracy in chaining/tape.

6. Field problems in distance measurement.

7. Obstacle to ranging & chaining.

8. Accuracy & errors (sources, kinds & law of probability).

9. *Measurement of Angle & Direction:*

10. Reference meridians, bearing and azimuths

11. magnetic declination and its variation.

12. *Traversing:*

13. Chain**,** compass traversing,

14. open traverse, close traverse,

15. closing error and magnitude of closing error

16. Graphical adjustment of close traverse.

17. *Area Calculation:*

18. Area of regular boundaries by mathematical formulae,

19. use of trapezoidal & Simpsons formula, their limitations

20. Planimeter (construction, use & area calculations),

21. use of zero circle & solution of numerical problems

22. *Theodolite surveying*.

23. Details of transit theodolite, definition & terms

24. temporary adjustment of and permanent adjustment of vernier theodolite.

25. Measurement of horizontal and vertical angle.

26. Application of theodolite in field problems.

27. Sources of error in the thedolite work

28. procedure to eliminate/minimize the errors

29. *Leveling:* Definitions of various terms in leveling.

30. Types of leveling, sources of errors in leveling.

31. Curvature and refraction corrections.

32. Temporary and permanent adjustment of dumpy & tilting levels.

33. Computation of levels.

34. Profile leveling (L-Section and cross-sections).

35. Special method of spirit leveling, differential leveling.

36. *Plane Table Surveying:*

37. Elements of plane table survey, working operations.

38. Methods of plane table survey (intersection, radiation, traversing and resection).

39. Two point and three point problems by Lehmann's method

40. Revision

41. Revision

42. Revision

43. Revision

44. Revision

45. Revision

Suggested Books & References

1. Arora K. R., 'Surveying', Vol. I & II.

2. Punmia B.C., 'Surveying' Vol. I & II.

3. Clendinning and Oliver, 'Principles and use of surveying instruments'.

4. Kanetkar T. P., 'Surveying and leveling', Vol. I & II.

5. Duggal S. K., 'Text book-Surveying', Vol. I & II.

Head

COLLEGE OF TECHNOLOGY AND ENGINEERING

DEPARTMENT OF CIVIL ENGINEERING
2 YEAR BE IISEMESTER SESSION 2017-18

1. Course Code   :   **CE 226**

2. Course Title   :   **DISASTER MANAGEMENT**

3. Credit   :   2(1+1)

4. Theory Lecture Outlines   :

    1. Definition of Disasters/Hazards, Types of Disasters: Natural and Manmade Disasters.

    2. Introduction to Tsunami, Flood and Cyclone disasters..

    3. Mitigation, Prevention, Preparedness, Response

    4. Rehabilitation and Recovery of these disasters

    5. Introduction to Landslide, Nuclear, Chemical and Fire disasters.

    6. Mitigation, Prevention, Preparedness, Response,

    7. Rehabilitation and Recovery of these disasters.

    8. *Earthquakes:* Earthquake terminology,

    9. Earthquake Magnitude & Intensity and their measuring scales, Occurrence of earthquakes

    10. : Plate tectonic theory.

        Effect of earthquake on structures Planning/architectural concepts,

    11. Earth quake resistant practices/features.

    12. Vulnerability of Indian continent to different types of disasters.

    13. *Various Case studies:* Case study of Bhuj Earthquake (2001), Case of study Bhopal Gas Tragedy (1984),

    14. Case study of Tsunami in Indian Continent (2006), Case study of Japan Nuclear Tragedy (2011).

    15. Revision

Suggested Books & References

1. G.K. Ghosh , *"Disaster Management",* A.P.H. Publishing Corporation
2. B Narayan , *"Disaster Management",* A.P.H. Publishing Corporation
3. Nikuj Kumar , *"Disaster Management",* Alfa Publications
4. Day R.W. (2002). Geotechnical Earthquake Engineering Handbook, McGraw-Hill Handbooks, New york.

Head

1. Course Code   :   **CE 321**

2. Course Title   :   **THEORY OF STRUCTURES-II**

3. Credit   :   4 (3+1)

4. Theory Lecture Outlines   :

     1. Rolling Load

     2. Rolling load on beams

     3. Statically determinate frames

     4. Shear force due to concerted loads,

     5. Bending moments due to concerted loads

     6. Uniformly distributed loads for longer span

     7. Uniformly distributed loads for shorter than span.

     8. Influence Line

     9. Influence Line Diagrams for shear force

     10. Influence Line Diagrams for Bending moment

     11. Influence Line Diagrams for Stress

     12. Deflection for simple supported beams

     13. Statically determinate frames

     14. Deflection for Statically determinate frames

     15. Muller-Breslau principle

     16. Applications of Muller-Breslau principle

     17. Numerical Problems

     18. Unsymmetrical Bending

     19. Definition of unsymmetrical Bending

     20. Location of Neutral Axis

     21. Computation of stresses

     22. Shear center

     23. Location of Shear center for common structural shapes

     24. Numerical Problems

     25. Numerical Problems

26. Arches

27. Linear arch

28. Eddy's theorem

29. Analysis of three hinged arch

30. Analysis of two hinged arches

31. Moving loads on three hinged

32. Moving loads on two hinged arches

33. Numerical Problems

34. Cable and Suspension Bridges

35. Analysis of cable

36. Analysis of cables with concentrated loading

37. Analysis of cables with continuous loading

38. Analysis of two hinged stiffening girder

39. Analysis of three hinged stiffening girder

40. Influence lines for Bending Moment

41. Influence lines for Shear Force

42 -45   Numerical Problems

Suggested Books & References

1.   Junarkar,' Mechanics of Structures' Vol. II.

2.   Punmia, B.C., 'Strength of materials and Theory of structures' Vol. II.

3.   Vazirani & Ratwani, 'Analysis of Structures' Vol. II.

Head

1. Course Code   :   **CE 322**

2. Course Title   :   **DESIGN OF CONCRETE STRUCTURES-II**

3. Credit   :   4(3+1)

4. Theory Lecture Outlines   :

1. Continuous Beams
2. Design of continuous R.C. beams (using I.S. code coefficients)
3. Numerical problems
4. Portal Frame
5. Design of rectangular portal frame (one storey) with fixed end at base
6. Numerical problems
7. Design of rectangular portal frame (one bay) with fixed end at base
8. Numerical problems
9. Yield Line Theory
10. Concept of yield line theory
11. Design of rectangular slab with U.D.L.
12. Design of rectangular slab with simple support conditions
13. Numerical problems
14. Beams Curved in Plan
15. Analysis of ring beams uniformly loaded
16. Analysis of ring beams supported on equi-spaced columns
17. Numerical problems
18. Numerical problems
19. Domes
20. Design of circular domes with UDL at crown
21. Numerical problems
22. Design of circular domes with concentrated load at crown
23. Numerical problems
24. Water Tanks
25. Water Tanks (Using working stress design method)

26.	Design of rectangular and circular tanks (as per I.S. 3370).
27.	Numerical problems
28.	Numerical problems
29.	Design of Intze type tanks (membrane analysis only).
30.	Numerical problems
31.	Numerical problems
32.	Design of column brace type staging.
33.	Numerical problems
34.	Numerical problems
35.	Design of annular raft foundation
36.	Numerical problems
37.	Numerical problems
38.	Elements of Pre stress Concrete
39.	Principles, systems and advantages
40.	Material properties
41.	Losses of pre stress
42.	Analysis of rectangular and I section, I.S. specifications
43.	Numerical problems
44.	Design of a simple rectangular beam for flexure as per I.S. 1343 (excluding end block)
45.	Numerical problems

Suggested Books & References
1. Jain A.K., 'Reinforced Concrete-Limit State Design', Nem Chand & Bros. Roorkee.
2. Krishna J. and Jain O.P., 'Plain and Reinforced Concrete, Vol. II. New Chand & Bros. Roorkee.
3. Dayaratnam P., "Reinforced Concrete Structures' Oxford and IBH Publishing Co.
4. Punamia B.C., ' Reinforced Concrete Structures II', Laxmi Publication Pvt. Ltd.
5. Pillai and Menon, 'Reinforced Concrete Design ', Tata McGraw Hill, New Delhi.
6. Gray W.S. and Mannings G.L. 'Reinforced Concrete Water Towers, Bunkers, Silos & Grantries', Concrete Publication Limited.
7. Reynolds C.E. and Steadman, J.C., 'Reinforced Concrete Design Hand Book',
8. Relevant IS Codes.

Head

COLLEGE OF TECHNOLOGY AND ENGINEERING

DEPARTMENT OF CIVIL ENGINEERING

3 YEAR BE II SEMESTER SESSION 2017-18

1. Course Code : **CE 323**

2. Course Title : **DESIGN OF STEEL STRUCTURES-II**

3. Credit : 4(3+1)

4. Theory Lecture Outlines :

    1. Roof Truss

    2. Design of steel roof truss including end connections

    3. Numerical Problems

    4. Numerical Problems

    5. Numerical Problems

    6. Light Gauge Structures

    7. Introduction to design of structures with light gauge sections

    8. Numerical Problems

    9. Numerical Problems

    10. Numerical Problems

    11. Plate Girder

    12. Design of plate girder under dead load

    13. Numerical Problems

    14. Design of plate girder under super imposed load,

    15. Numerical Problems

    16. Numerical Problems

    17. connections flange plate to flange angles

    18. Numerical Problems

    19. connections flange angles to web

    20. connections to web and flange

    21. Numerical Problems

    22. Splicing of web

    23. Intermediate and bearing stiffeners

    24. Numerical Problems

    25. Numerical Problems

26.	Design of steel and masonry chimney stacks excluding their foundation, (Cantilever & braced type)
27.	Numerical Problems
28.	Numerical Problems
29.	Numerical Problems
30.	Influence Lines
31.	Numerical Problems
32.	Influence lines of Pratt, Warren and 'K' type trusses.
33.	Numerical Problems
34.	Numerical Problems
35.	Steel Bridges
36.	Design of deck type truss bridges for railway loading
37.	Numerical Problems
38.	Numerical Problems
39.	Design of through type truss bridges for railway loading
40.	Numerical Problems
41.	Design of lateral bracing
42.	Numerical Problems
43.	Numerical Problems
44.	Revision
45.	Revision

Suggested Books & References

1. Arya & Ajmani, 'Design of Steel Structure'.
2. Punmia B. C., 'Design of Steel Structure'.
3. Ramchandra, 'Design of Steel Structure'
4. Relevant IS Codes.

Head

1. Course Code   :   **CE 324**

2. Course Title   :   **GEOTECHNICAL ENGINEERING-II**

3. Credit   :   4(3+1)

4. Theory Lecture Outlines   :

   1. Stress in Soil under Surface Loading

   2. Bossinesq's and Westergaard's analysis for vertical pressure and its distribution in a soil mass

   3. Numerical Problems

   4. Vertical stresses, horizontal and shear stresses (due to concentrated loads)

   5. Isobar diagram, Vertical stress distribution on a horizontal plane

   6. Influence diagram.

   7. Vertical stresses at point under line load and strip load

   8. Vertical stresses at a point under circular and rectangular loaded area,

   9. Numerical Problems

   10. New Marks' chart.

   11. Pressure bulb and its significance in Foundation exploration.

   12. Stresses in soil below foundations

   13. Compressibility and Consolidation

   14. One-dimensional consolidation of soil, Degree of consolidation

   15. consolidation test, Terzaghis one-dimensional consolidation theory

   16. Compressibitliy parameters, co-efficient of consolidation

   17. Preconsolidation pressure and its determination, Normally, over and under consolidated soils

   18. Methods of predicting settlement & its rate. Total and differential Settlement

   19. Stability of Slopes: Classification of slopes

   20. Stability analysis of infinite slopes

   21. Stability of finite slopes by Swedish and Friction circle method.

   22. Numerical Problems

   23. Taylor's stability number curve

   24. Earth Pressure , Active, passive and earth pressure at rest

25. Rankine's and Coulomb's theories, Horizontal and inclined cohessionless back fill.

26. Rebhann's and Culman's graphical method for active earth pressure (vertical and inclined back retaining walls)

27. Stability analysis of retaining walls.

28. Bearing Capacity of Soils

29. *Terminology related to bearing capcaity.*

30. *Common types of foundations.*

31. *Terzaghi and Meyehoffs theory for bearing capacity.*

32. *Rankine's method for minimum depth to foundation Skempton's method.*

33. *Effect of water table on bearing capacity*

34. *IS code method to determine bearing capacity.*

35. *Plate load and penetration tests.*

36. Site Investigations

37. Planning of Investigations, Methods of explorations,

38. depth of exploration. Undisturbed and disturbed samples.

39. Types of Samples. Brief description of procedures of sampling,

40. Transportation and storage of samples, Depth, number &extent of boreholes

41. Geophysical methods of investigations.

42. Foundations

43. Introduction to pile, well and machine foundations.

44. Revision

45. Revision

Suggested Books & References

1. Punmia, B.C., 'Soil Mechanics and Foundations'.
2. Ranjan G. & Rao, 'Basic and Applied Soil Mechanics'.
3. Singh Alam, 'Soil Engineering in Theory and Practice'.
4. Arora, K.R., 'Soil Mechanics & Foundation Engineering'.
5. Varghese, 'Foundation Engineering', Prentice' –Hall of India.

Head

COLLEGE OF TECHNOLOGY AND ENGINEERING

DEPARTMENT OF CIVIL ENGINEERING
3 YEAR BE II SEMESTER SESSION 2017-18

1. Course Code   :   **CE325**

2. Course Title   :   **TRANSPORTATION ENGINEERING-I**

3. Credit   :   4(3+1)

4. Theory Lecture Outlines   :

1. Introduction: Importance and Role of Transportation Systems

2. Transportation Modes

3. Transportation comparison

4. Highway Planning

5. Highway planning Process (specifically of India)

6. Preparation of master plan

7. Classification of Roads

8. Road Patterns

9. Highway Alignment (Controlling Factors and Surveys),

10. Introduction to rural roads

11. Introduction to hill roads

12. Highway Geometric

13. Design Cross Sectional Elements

14. Camber, Sight Distances

15. Definition and analysis of SSD and OSD

16. Design of Horizontal Alignment

17. Numerical Problems

18. Numerical Problems

19. Super elevation, extra widening, transition curves

20. Vertical Alignment (Gradients and types of vertical curves).

21. Elementary Traffic Engineering

22. Significance of different Traffic Engineering Studies (Speed, Volume, O & D, Parking and Accident's Study)

23. Importance and type of Traffic Signs, Signals, Road Marking and Road Intersections.

24. Highway Materials

Suggested Books & References

1. Khanna and Justo, 'Highway Engineering'.
2. L.R. Kadiyali, 'Highway Engineering'.
3. G.R.Rao , 'Traffic Engineering and Transportation Planning'.
4. Chakrobrati and Das, 'Principles of Transportation Engineering'

Head

1. Course Code   :   **CE 326**

2. Course Title   :   **MATRIX METHODS OF STRUCTURAL ANALYSIS**

3. Credit   :   2(0+2)

4. Theory Lecture Outlines   :

1. Introduction to Flexibility

2. Stiffness Matrices

3. Static and kinematic indeterminacy

4. Properties of stiffness and flexibility matrices.

5. Compatibility condition

6. Analysis of simple structures

7. Plane Trusses and Plane Frames

8. Stiffness matrix for axial force members (plane truss).

9. Stiffness matrix for flexural members (plane frame).

10. Stiffness matrix for combined axial force,

11. flexure and torsion.

12. Transformation matrix,

13. stiffness matrices in global coordinates.

14. Formation of global equations.

15. Solution for displacement and forces under gravity.

16. lateral loads

17. Space Truss

18. Stiffness matrix analysis of space trusses

19. Computer Technique

20. Computer solution of problems by stiffness method

21. Advantage of the stiffness method

22. Introduction to Finite Element Analysis

23. Introduction (background & general description of the method).

24. Analysis procedure

25. Element stiffness matrix

26. overall stiffness matrix for a structure

27. Solution of a problem

28. Revision

29. Revision

30. Revision

Suggested Books & References

1. Pandit G.S., & Gupta S.P., "Structural Analysis (A matrix approach)", Tata McGraw Hill Publishing Ltd.

2. J.S.Przemieniecki, "Theory of Matrix Structural Analysis", McGraw-Hill.

3. Meek,J.L., "Matrix Structural Analysis".

4. Kanchi, "Matrix Structural Analysis", Wiley Eastern Ltd., New Delhi

5. Cook R.D., Malkas D.S. & Plesha M.E, "Concepts and applications of Finite element analysis", John Wiley & Sons.

6. Bathe, K. J., "Finite Element Procedures in Engineering Analysis".

7. Desai, C. S. and Kundu T., "Introductory Finite Element Method".

Head

COLLEGE OF TECHNOLOGY AND ENGINEERING

DEPARTMENT OF CIVIL ENGINEERING
4 YEAR B TECH II SEMESTER SESSION 2017-18

1. Course Code   : **CE 421**

2. Course Title   : PROJECT EVALUATION & CONSTRUCTION MANAGEMENT

3. Credit   : 3(2+1)

4. Theory Lecture Outlines :

   1. Introduction
   2. Construction project management frame work
   3. Planning scope objectives & function of project management
   4. Construction Planning: Introduction
   5. different types of planning
   6. Scheduling, methods of scheduling
   7. Job planning & job lay outs
   8. Problems
   9. Problems
   10. Network Techniques
   11. Elements of CPM and PERT as applied to the construction projects
   12. Errors & updating of Network
   13. Control of progress
   14. Problems
   15. Problems
   16. Contract Management: Legal aspect of contracts, laws related to contract
   17. Different types of contract
   18. Elements of tender operation
   19. Contract negotiation & award of work
   20. Settlement of disputes
   21. Problems
   22. Problems
   23. Safety in Construction: Introduction
   24. Accidents prevention, causes of accidents

25. Safety measure to be followed in various construction works like excavation, demolition, explosive handling, hot bitumen work etc.
26. Management Information System: Concept of Project Management Information System.
27. Benefits of computerized information system.
28. Problems
29. Revision
30. Revision

Suggested Books & References
1.   Chitkara K.K., 'Construction Project Management.
2.   Gupta & Gupta, 'Construction Management & Accounts.

Head

1. Course Code : **CE 422**

2. Course Title : PUBLIC HEALTH ENGINEERING-II

3. Credit : 4(3+1)

4. Theory Lecture Outlines :

   1. Sewage Disposal: Introduction
   2. Systems of sewage disposal, conservancy system & water carriage system
   3. Separate, Combined and partially separate system, their advantage & disadvantage
   4. Suitability of separate sewerage system for India
   5. Manholes, drop manhole, catch basins
   6. flushing devices, grease & sand traps
   7. Material for sewer pipes
   8. Shape of sewers
   9. Laying the sewers
   10. Problems
   11. Problems
   12. Design of Sewers: Quantity of sewage
   13. Provision for future population
   14. Quantity of storm water
   15. Design of sewers
   16. Numericals
   17. Numericals
   18. Estimating storm water by time of concentration method
   19. Testing of sewer line
   20. Cleaning of sewers
   21. Problems
   22. Problems
   23. Preliminary Treatment: screening
   24. Disposal of screening
   25. Skimming tank
   26. Grit chamber, disposal of grit

27. Sewage Treatment: Principle of sewage

28. Sedimentation

29. Filtration, intermittent sand filter

30. Contact bed, introduction of trickling filter

31. Advantage & disadvantage of trickling filter.

32. Problems

33. Problems

34. Introduction of Solid Waste Management: General

35. Classification of municipal solid waste

36. Quantity of waste generation

37. Objectives of solid waste management

38. Environmental problems associated with solid waste

39. Activities associated with generation of solid waste

40. Factors affecting solid waste

41. Introduction of sanitary land filling

42. Problems

43. Problems

44. Revision

45. Revision

Suggested Books & References

1 Hussain, S.K., 'Text book of water supply & sanitary engineering ', Oxford & IBH Publishing co. pvt. Ltd., New Delhi.

2 Rangwala, S.C., 'Fundamentals of water supply & sanitary engineering', Charotar Publisher House, Anand.

3 Punamia, B.C., 'Water supply & sanitary engineering'. Laxmi publishers. Jodhpur

4 Garg, S.K., 'Water supply & sanitary engineering', Khanna publishers. New Delhi.

5 'Standard Methods for the examination of water and waste water', 19th edition, prepared and published jointly by ALPHA, AWWA, WEF.

Head

1. Course Code : **CE 423**

2. Course Title : IRRIGATION ENGINEERING AND HYDRAULIC STRUCTURES

3. Credit : 4(3+1)

4. Theory Lecture Outlines :

1. Irrigation Practices: Need for Irrigation in India

2. Scope (soil moisture & plant growth)

3. System of irrigation (surface & subsurface irrigation method)

4. Irrigation water quality, water requirements & irrigation scheduling of crops

5. Duty & Delta (Base period-relationship)

6. Irrigation efficiencies

7. Assessment of irrigation water

8. Environmental impact of irrigation projects

9. Numericals

10. Numericals

11. Problems

12. Canal Irrigation: Sediment Transport

13. Importance & Mechanics of transport

14. Estimation of bed load & suspended load

15. Design of channels in India

16. Regime channels

17. Kennedy and Lacey's theory

18. Water Logging: Water logging & salt efflorescence

19. Causes and effects

20. Control measures (canal lining)

21. Problems

22. Problems

23. Diversion Head Works: Design for surface and subsurface flows

24. Bligh's and Khosla's methods

25. Selection of site layout of different parts of a diversion headwork

26. Types of weirs and barrages

27. Design of weirs on permeable foundation

28. Silt excluders and different types of silt ejectors

29. Energy dissipation

30. Regulator: Types of canals head regulators

31. Cross regulator

32. Problems

33. Problems

34. Falls: Classification of falls

35. Design of falls.

36. Canal Transitions: Cross drainage works

37. Flood control works (flood forecasting-methods).

38. River Training Works

39. Sediment control and silt exclusion devices

40. Escape bed bars.

41. Drainage: Necessity

42. Reclaimation of land and water resources

43. Surface and sub surface drainage system and their design

44. Numericals

45. Revision

Head

1.	Course Code	:	**CE 424 (a)**
2.	Course Title	:	REPAIR AND REHABILITATION OF CONCRETE STRUCTURES
3.	Credit	:	4(3+1)
4.	Theory Lecture Outlines	:	

1. Deterioration of Concrete Structures: Introduction
2. Causes of Deterioration: permeability, carbonation
3. Sulphate attack, chloride attack
4. Alkali-aggregate reaction, corrosion
5. Factors affecting deterioration (environment, cover, types of constituent material, cement content, W/C ratio & workmanship)
6. Preventive measures
7. Problems
8. Corrosion of Reinforcement: Anodic, cathodic reaction
9. Chloride ion presence, factor affecting corrosion
10. Codal provisions for limiting chloride content
11. Methods for corrosion measurement and assessment: Half cell potential and Resistivity
12. *Cracks:* Factors contributing cracks in concrete
13. Type of cracks & pattern
14. Problems
15. Investigation of deteriorated structures: Preliminary test methods (visual observation)
16. **N.D.T.** Non destructive test methods for concrete
17. Rebound hammer
18. Ultrasonic pulse velocity
19. Penetration techniques and pull out test
20. Revision
21. Materials for Repair: Properties
22. Selection criterion
23. Types of material (polymers and resins)
24. Special Repair Techniques: Grouting

25. Shotcrete

26. Under water repair: materials

27. Equipments

28. Precautions process etc.

29. Revision

30. Revision

Suggested Books & References

1. Bungey and Milard ,'Testing of concrete structures'.

2. Allen & Edward, 'The repair of concrete structures'

3. Mehta, PK &. Monteriro, P.J.M 'Concrete Microstructure, Properties and Materials'.

4. Neville, 'Properties of Concrete'.

Head