

**B.TECH. FORTH YEAR**  
**(CIVIL ENGINEERING)**  
 (Batch 2015)  
 (Session 2018-2019)

**SCHEME OF PAPERS**

**SEVENTH SEMESTER (Civil Engineering)**

Sr.No.	Course No.	Title	L	T	P	Credits
1.	CVE-401	Geo technology - II	3	1	0	3.5
2.	CVE-402	Waste Water Engineering	3	1	0	3.5
3.	CVE-403	Bridge Engineering	3	1	0	3.5
4.	CVE-404	Railway and Airport	3	1	0	3.5
5.		<b>Elective III</b>	3	1	0	3.5
6.		<b>Elective IV</b>	3	1	0	3.5
7.	CVE-451	Geo technology - II (LAB) *	0	0	2	1.0
8.	CVE-452	Project Lab*	0	0	4	2.0
			<b>18</b>	<b>6</b>	<b>6</b>	<b>24.0</b>
<b>Total Contact Hours: 30</b>						

\*CVE 451 and CVE 452 are practical papers only.  
 There will not be any theory examination for these papers.

**The students are required to study any one subject each from Elective - III and Elective - IV**

S.No.	Course No.	Elective III	L	T	P	Credits
1	CVE 405	Disaster Management	3	1	0	3.5
2	CVE 406	Advance Traffic Engineering	3	1	0	3.5
3	CVE 407	Element of Remote Sensing and GIS	3	1	0	3.5
4	CVE 408	Air Quality Management	3	1	0	3.5
5	BAS 202	Operations Research	3	1	0	3.5

S.No.	Course No.	Elective IV	L	T	P	Credits
1	CVE 410	Earthquake Engg.	3	1	0	3.5
2	CVE 411	Environmental Laws and Treaties	3	1	0	3.5
3	CVE 412	Site Organization and Management	3	1	0	3.5
4	CVE 413	Ground Improvement	3	1	0	3.5
5	HSS 201	Management Practices & Organisational Behaviour	3	1	0	3.5

Department of Civil Engineering

PunjabiUniversity, Patiala.

General Instructions to the Paper Setters

(Common for B.Tech. in Computer Engineering, Electronics and communication Engineering, Mechanical Engineering, Civil Engineering and Integrated BTech/MBA Branches)

Applicable to 2015 Batch

The B. Tech paper structure will be as shown below:

<b>Pattern of Question Paper</b>	
TITLE OF SUBJECT (CODE----	
Bachelor of Technology (Branch) Section: .....	
End Semester Exam	
TIME ALLOWED: 3 Hour	Roll. No.....
Maximum Marks: 50	
Note:- Attempt any Six questions selecting three questions from each section A and B. Section C is compulsory.	
<b>Section-A (From Section A of the syllabus)</b>	
Q1. ....	
Q2. ....	
Q3. ....	
Q4. ....	3x5
Q5. ....	
<b>Section-B (From Section B of the syllabus)</b>	
Q6. ....	
Q7. ....	
Q8. ....	
Q9.....	
Q10.....	3x5
<b>Section-C (Common from Whole of the Syllabus)</b>	
Q11	
a).....	
b) .....	
c) .....	
d) .....	
e) .....	
f) .....	
g) .....	
h) .....	
i) .....	
j).....	10x2=20

Note for the paper setter:

1. Numbers of questions to be set are nine (11) as per the above format.
2. Section A and B contain 10 questions of (5) marks each.
3. Section C is compulsory and contains ten sub-parts of one mark each. The answers for each question should preferably be of 2 to 3 lines.
4. The maximum limit on numerical questions to be set in the paper is 35% while minimum limit is 20% except theoretical, analysis and design papers
5. The paper setter shall provide detailed marking instructions and solution to numerical problems for evaluation purpose in the separate white envelopes provided for solutions.
6. The paper setters should seal the internal & external envelope properly with signatures & cello tape at proper place.
7. Log tables, charts, graphs, Design data tables etc. should be specified, whenever needed.
8. Use of Scientific calculator should be clearly specified.
9. There are some MBA subjects (*like BAS 202 Operational Research, MBA 5011 Foundation of Financial Accounting, MBA 5012Foundation of Managerial Accounting, MBA 5022 Foundations of Marketing, MBA 5023 Foundations of Law, MBA 5031 Foundations of Macroeconomics, MBA 5032 Foundations of Microeconomics, MBA-5033 Foundations of International Business, MBA 5013 Foundations of Finance*) where syllabus is not divided among four sections namely A, B,C,D then Question paper must be set by without specifying section in it and giving proper weightage to the respective portions.

## CVE 401 GEOTECHNOLOGY II

L	T	P	Credits
0	0	2	1.0

### Section A

Introduction to soil exploration: scope, soil exploration for different structures, spacing, significant depth, boring and sampling techniques, types of samples, penetration test (SCP and SPT), sample disturbances and Geophysical methods.

Earth Pressure: Earth Pressures at rest condition, states of plastic equilibrium, Rankine and Coulomb's theories for active and passive conditions, Influence of surcharge, water table, wall friction, Rehmann's and Culmann's graphical methods, open cuts, Retaining Walls.

Stability of Slopes: Infinite slope, types of failure, total and effective stress analysis, Taylor's stability numbers, concept of factors of safety, method of slices, Swedish's circle method, friction circle method, effect of sudden draw down and submergence.

Design of Shallow Foundation: Bearing Capacity, Definitions, depth of foundation, Terzaghi's general bearing capacity equation, IS code equation, factors affecting bearing capacity. Settlements for clays and sands, permissible settlements, bearing capacity by penetration tests, plate load test. Types of Shallow Foundations, Design Criteria, Stability, Shear, and Settlement Failures, Influence of eccentric and inclined loads.

### Section C

Pile Foundations: Types, function, selection of piles, pile driving formulae, equipment, point, bearing and friction piles. Load carrying capacity of single pile, group action, spacing of piles, Negative skin friction, Piles subjected to lateral loads, settlement of pile groups, under reamed piles.

Caissons and Wells: Introduction, components, shapes, stability of well foundation, Terzaghi's method of analysis, sinking of well, tilts and shifts.

Foundation in Difficult Grounds: Ground Improvement techniques, drainage and dewatering, Foundation in Swelling Soils, use of Soil reinforcement.

Machine Foundation: Definition, types, problem of machine foundation, spring mass analogy, coefficient of elastic uniform compression, free and damped vibration, block foundation test, Cyclic plate load test, mathematical models, design criteria.

### Recommended Books

1. GopalRanjan Rao, ASR Rao, Basic and Applied Soil Mechanics, by, New Age Int. (P) Ltd. Pub., New Delhi,
2. VNS Murthy, A Text Book of Soil Mechanics Foundation Engg., U.B.S, New Delhi.
3. Peck, Foundation Engineering, Wiley Eastern India Limited, New Delhi.
4. K.R. Arora, Soil Mechanics & Foundation Engineering, Standard Publishers, New Delhi.

**CVE 402 WASTE WATER TREATMENT**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Crédits</b>
<b>3</b>	<b>1</b>	<b>0</b>	<b>3.5</b>

**Section-A**

Introduction: Terms & definitions, systems of sanitation and their merits and demerits, system of sewerage, choice of sewerage system and suitability to Indian conditions.

Sewerage system: Generation and Estimation of Community Sewage; Flow variations; Sewer appurtenances; Construction and Maintenance of sewers; Sewage pumping and pumping stations; Design of sewers and storm water sewers.

Characterization of sewage: Composition of domestic and industrial sewage, sampling, physical, chemical and microbiological analysis of sewage, biological decomposition of sewage, BOD and BOD kinetics.

Treatment of sewage: Basic principles of sewage treatment; Introduction to unit operations and processes - primary treatment units such as screening, grit chamber, Flootation units; Sedimentation tanks, secondary treatment units such as different types of aerobic suspended and attached growth systems, and tertiary treatment for polishing, nutrient removal and disinfection; Sludge Handling and disposal – thickening, stabilization, dewatering, drying and disposal.

**Section-B**

Sewage treatment units design: Design of grit chamber, primary and secondary clarifiers, ASP, TF, stabilization ponds.

Treated effluent disposal: Disposal into surface water bodies; Reuse for irrigation and aquaculturing; Land disposal; Disposal through injection into groundwater; effluent standards

Low cost sanitation systems– Imhoff tanks, septic tank - soakage pit/soil absorption systems; stabilization ponds; macrophyte ponds; oxidation ponds; and constructed wetland systems.

Plumbing: Sewer connections for houses and buildings; Traps, sanitary fittings & fixtures.

**Recommended Book**

1. S.K. Garg, Environmental Engineering Vol. II, Khanna Publishers New-Delhi
2. Peavy. Rowe and Tchobanglous Environmental Engineering, McGraw Hill.
3. P.N. Modi Sewage Treatment and disposal & Waste Water Engineering,  
Standard Book House New-Delhi.
4. McGhee Water Supply and Sewerage,, McGraw Hill.

## CVE 403 BRIDGE ENGINEERING

L	T	P	Credits
3	1	0	3.5

### Section A

Introduction: Definition, components of a bridge, classifications, importance of bridges.

Investigation of Bridges: Need for investigations, selection of bridge site, preliminary data to be collected, design discharge and its determination, linear waterway, economical span, vertical clearance above HFL, scour depth, choice of bridge type

Standard Specifications: Road bridges, I.R.C. loadings, code provisions on width of carriageway, clearances, loads considered etc.

Slab type Bridges: Design of R.C.C. Orthogonal and Skew Culverts

### Section B

Reinforced Concrete Bridges: T-Beam Bridge, Courbon's theory for load distribution. Balanced cantilever bridges, Pre-stressed concrete bridges (General discussions)

Sub Structure: Types of piers and abutments, design forces, design of piers and abutments.

Bearing and Joints: Various types of expansion bearing and fixed bearings, elastomeric bearings, joints and their types, design of bearings

Construction, inspection and maintenance of bridges

### Recommended Books

1. D. Johnson Victor, Elements of Bridge Engineering,, Oxford and IBH Publishers, New Delhi.
2. Vazirani&Ratwani, Design of Concrete Bridges, Khanna Publishers, New Delhi
3. V.K. Raina, Analysis, Design and Construction of Bridges, Tata McGraw Hill

## CVE 404 RAILWAYS AND AIRPORT ENGINEERING

L	T	P	Crédits
3	1	0	3.5

### Section A

Rail transportation and its importance in India. Permanent way: requirements and components. Gauges in India and abroad. Selection of gauge. Coning of wheels. Adzing of sleepers. Rails: functions, composition of rail steel, types of rail sections, requirements of an ideal rail section, length of rails. Defects in rails. Creep of rails. Long welded rails and continuously welded rails.

Sleepers: functions, requirements of an ideal sleeper. Types of sleepers: wooden, cast iron, steel and concrete sleepers, advantages, disadvantages and suitability of each type. Sleeper density. Fastenings for various types of sleepers: fish plates, spikes, bolts, bearing plates, keys, chairs, jaws, tie bars. Elastic fastenings. Ballast: functions, requirements, types of ballast and their suitability.

Necessity. Turnout: various components, working principle. Switch: components, types. Crossing: components and types. Design elements of a turnout, design of a simple turnout. Layout plan of track junctions: crossovers, diamond crossing, single-double slips, throw switch, turn table, triangle.

Signals: objects, types and classification. Semaphore signal: components, working principle. Requirements / principles of a good interlocking system. Brief introduction to devices used in interlocking. Methods of control of train movements: absolute block system, automatic block system, Centralized train control and automatic train control systems.

### Section B

Gradients, grade compensation. Super elevation, cant deficiency, negative super elevation. Maximum permissible speed on curves. Tractive resistances, types. Hauling capacity of a locomotive.

Stations: functions and classification. Junction, non-junction and terminal stations. Yards: functions, types. Marshalling yard: functions, types. Maintenance of railway track: necessity, types of maintenance. Brief introduction to mechanized maintenance, M.S.P and D.T.M.

Air transportation, its importance and characteristics, status in India. Layout plan of an airport and its basic elements: terminal area, apron, taxiway, runway, hanger. Aircraft characteristics, their effect on elements of an airport. Site selection of an airport. Classification of airports.

Runway orientation, Wind Rose diagram. Basic runway length. Corrections to basic runway length. Runway patterns. Difference between highway and runway pavement. Types of runway pavements. Design factors for runway pavement. Brief introduction to design of thickness of a runway pavement.

### Recommended Books:

1. S.C.Saxena and S.P.Arora, A text book of Railway Engineering, Dhanpat Rai Publications, N.Delhi.
2. J.S.Mundray, Railway Track Engg., Tata McGraw-Hill Publishing Co. Ltd. N.Delhi.
3. S.K.Khanna, M.G.Arora, Airport Planning and Design, Nem Chand Bros., Roorkee.
4. Robert Hornjeff, The Planning and Design of Airports, McGraw Hill Book Co.
5. Virender Kumar & Satish Chandra, Air Transportation Planning and Design, Galgotia Publications, N.Delhi

## CVE 405 DISASTER MANAGEMENT

L	T	P	Crédits
3	1	0	3.5

### Section A

**Introduction to Disaster:** Definition, Factors and Significance; Difference between Hazard And Disaster; Natural and Man made Disasters- Nature, Types and magnitude.

**Natural Disaster: Hydro-meteorological based disasters:** Tropical Cyclones, Floods, and Droughts. Hydro-meteorological based disasters: Desertification Zones and Forest Fires. Geological based disasters: Earthquake, Tsunamis, Landslides, and Avalanches. **Manmade Disasters:** Chemical Industrial hazards, major power break downs, traffic accidents, Fire hazards etc, Industrial Accidents, Oil Slicks And Spills, Outbreaks Of Disease And Epidemics, War And Conflicts. Chemical Industrial hazards

### Section B

**Disaster Preparedness:** Concept and Nature, Disaster Preparedness of People And Infrastructure, Community Based Planning. Role And Responsibilities Of Different Agencies And Governments In Disaster Preparedness Educational Institutions, Local District And State Administration.

**Disaster Management:** Concept and Elements. Pre-Disaster Management, Post Disaster Management, Integrated Developmental Planning For Disaster Management, Long Term Disaster Counter Planning. Post Disaster Management Search, Rescue, Evacuation and relief.

**Risk and Vulnerability to disaster mitigation and management options:** Warning and Forecasting.

**Use of remote sensing and GIS** in disaster mitigation and management.

### Text Books

1. Thomas D. Schneid., Disaster Management and Preparedness, CRC Publication, USA, 2001
2. Patrick Leon Abbott, Natural Disasters, Amazon Publications, 2002
3. Ben Wisner., At Risk: Natural Hazards, People vulnerability and Disaster, Amazon Publications, 2001
4. Oosterom, Peter van, Zlatanova, Siyka, Fendel, Elfriede M., “Geo-information for Disaster Management”, Springer Publications, 2005
5. Selected Resources Published by the National Disaster Management Institute of Home Affairs, Govt. of India, New Delhi.

## CVE – 406 ADVANCED TRAFFIC ENGINEERING

L	T	P	Credits
3	1	0	3.5

### Section A

Introduction and Traffic Characteristics: Objectives and scope of Traffic Engg. Organizational set up of traffic engineering department in India. Importance of traffic characteristics. Road user characteristics. Vehicular characteristics. Max dimensions and weights of vehicles allowed in India. Effects of traffic characteristics on various design elements of the road.

Traffic Surveys: Methods of conducting the study and presentation of the data for traffic volume study, speed study and origin and destination study. Speed and delay study. Parking surveys. On street parking, off street parking. Accident surveys. Causes of road accidents and preventive measures. Use of photographic techniques in traffic surveys.

Highway Capacity: Importance. Space and time headway. Fundamental diagram of traffic flow. Relationship between speed, volume and density. Level of service. PCU. Design service volume. Capacity of non-urban roads. IRC recommendations. Brief review of capacity of urban roads.

Traffic Control: Types of traffic control devices. Traffic signs, general principles of traffic signing, types of traffic signs. Road markings, types, general principles of pavement markings. Design of rotary. Grade separated intersections. Miscellaneous traffic control aids and street furniture.

### Section B

Signal Design: Types of signals. Linked or coordinated signal systems. Design of signal timings by trial cycle method, approximate method, Webster's method and IRC method

Traffic Regulation And Management: Need and scope of traffic regulations. Regulation of speed, vehicles and drivers. General traffic regulations. Motor vehicle act. Scope of traffic management. Traffic management measures: restrictions on turning movements, one way streets, tidal flow operations, exclusive bus lanes, traffic restraint, road pricing.

Traffic And Environment: Detrimental effects of traffic. Vehicular air pollution. Situation in India. Vehicular emission norms in India and abroad. Alternate fuels. Factors affecting fuel consumption. Arboriculture.

Computer Application, Traffic Simulation: Computer application in traffic engg., transport planning and public transport. Traffic simulation, advantages. Steps in simulation. Scanning techniques. Introduction to Intelligent vehicle highway system. Various types of IVHS.

#### Recommended Books:

1. L.R.Kadiyali Traffic Engg. And Transport Planning, Khanna Publishers, Delhi.
2. S.K.Khanna & C.E.G. Justo Highway Engg, Nem Chand Bros., Roorkee.
3. Drew, D.R., Traffic Flow Theory McGraw- Hill Book Co., New York.

## **CVE-407 ELEMENTS OF REMOTE SENSING & GIS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
<b>3</b>	<b>1</b>	<b>0</b>	<b>3.5</b>

### **Section A**

Basic concepts of remote sensing; Airborne and space borne sensors; Data acquisition; Digital image Processing; Restoration; Enhancement; Segmentation feature extraction; Clustering edge detection;

Geographic Information System; Introduction to Microwave remote sensing and Global Positioning System;

### **Section B**

Applications to Water resources; Land use and erosion; Forestry; Environment and ecology;

Use of relevant software for Remote sensing and GIS applications.

### **Recommended Books:**

1. Gopi S , GPS and Surveying using GPS, Tata McGraw Hill
2. Chang ,Introduction to GIS, Tata McGraw Hill

## CVE-408 AIR QUALITY MANAGEMENT

L	T	P	Credits
3	1	0	3.5

### Section A

Air pollutants, Sources, classification, Combustion Processes and pollutant emission,

Effects on Health, vegetation, materials and atmosphere, Reactions of pollutants in the atmosphere and their effects-Smoke, smog and ozone layer disturbance etc.

### Section B

Atmospheric diffusion of pollutants and their analysis, Transport, transformation and deposition of air contaminants on a global scale, Air sampling and pollution measurement methods, principles and instruments, Ambient air quality and emission standards, control principles,

Removal of gaseous pollutants by adsorption, absorption, reaction and other methods. Particulate emission control, settling chambers, cyclone separation, Wet collectors, fabric filters, electrostatic precipitators and other removal methods.

#### Recommended Books:

2. M N Rao , Air quality management Springer publication
3. Debashree Mukherjee ,SomnathHazra, Air pollution and health Tata McGraw Hill Publications
4. Arthur C Stren, Air pollution: air quality management Elsevier Publications

## BAS 202 OPERATIONS RESEARCH

L	T	P	Credits
3	1	0	3.5

### Section-A

Definitions, characteristics, necessity, scope and objectives of O.R. Phases of operations Research study, Limitations of O.R.

Linear Programming, assumptions in L.P. formulation of mathematical models for various types of L.P. problems, graphical methods & trial and error methods of solving L.P. problems, Limitations of L.P. methods.

Simplex method, artificial variable technique-the big-M method, degeneracy, unconstrained variables, duality in L.P.

Transportation model, formulation and solution of transportation problems, sensitivity analysis in T.P.

Assignment model, formulation and solution of assignment problems, sequencing problems.

### Section-B

Game theory, solution of games with and without saddle point, rules of dominance, arithmetic and algebraic methods for 2x2 games solution of 2xn or m x 2 games.

PERT & CPM Models: Characteristics & uses, Drawing of network, removal of redundancy in network, computing EOR, LOT, Free Slack, Total slack, Crashing, Resource allocations.

Inventory control, necessity for maintaining inventory, inventory cost, inventory models for bought-out items with & without shortages, inventory model for made-in items without shortages, inventory models with price-breaks, Inventory management techniques, solution of problems.

Simulation, advantages and limitations of simulation, Monte carlo method, solution of problems using simulation.

### Recommended Books:

1. P.K. Gupta and D.S. Hira, Operations Research, S. Chand and Co. Ltd., Ram Nagar, New Delhi, Ed. 1998.
2. H.A. Taha, Operations Research – an Introduction, Macmillan Publishing Co., New York, Ed. 1994.
3. Ravindran, Operations Research, John Wiley & Sons, N. York
4. A.P. Verma, Operations Research, S.K. Kataria & Sons
5. H.M. Wagner, Principles of Operation Research, PHI, New Delhi

## CVE 410 EARTHQUAKE ENGINEERING

L	T	P	Crédits
3	1	0	3.5

### Section-A

Introduction to Earthquakes, Causes of earthquakes, basic Terminology, Magnitude, Intensity, Peak ground motion parameters. Past earthquakes and Lessons learnt.

Introduction to theory of Vibrations, Sources of Vibrations, Types of Vibrations, Degree of Freedom, spring action and damping, Equation of motion of S.D.O.F. systems, Undamped, Damped system subjected to transient forces, general solution, green's function.

Lateral Force analysis, Floor Diaphragm action, Moment resisting frames, shear walls.

### Section-B

Concepts of seismic design, Lateral Strength, stiffness, ductility and structural configuration. Provision of IS 1893 for buildings.

Seismic Design of Masonry Structures, Provision of BIS 4326, BIS: 4326, BIS: 13828, BIS: 13827  
Seismic Design and Detailing of R.C.C. buildings, Provision of IS 13920.

### BOOK SUGGESTED

- 1 R.W. Clough and Joseph Penzien Dynamics of Structures. McGraw-Hill
- 2 Mario & Paz Structural Dynamics Van Nostrand Reinhold publisher
- 3 David J. Dowrick Earthquake Resistant Design John Wiley & Sons
- 4 Jai Krishna, Elements of Earthquake Engg Sarita Prakashan

## CVE 411 ENVIRONMENTAL LAWS AND TREATIES

L	T	P	Credits
3	1	0	3.5

Acts: Water act, Water Chess act, Air act, Environment Protection act and their amendments, Wildlife act and Forest acts.

Rules and Regulations: Review of water rules, air rules and environment rules with special reference to- Standards of emission or discharge of environmental pollutants.

Treaties: Earth Summit, Agenda-21, Kyoto Protocol, Biodiversity treaty, Monteral Protocol, Ramsar Convention of Watershed management

### Recommended Books

1. R.E. Munn, Environmental Impact Assessment, John Wiley, New York, USA
2. Pollution Control Law Series; PCL/2/2001, Central Pollution Control Board, New Delhi.
3. Eds, Jain and Clark, Environmental Technology Assessment and Policy, John Wiley, New York, USA

CVE 412 SITE ORGANIZATION AND MANAGEMENT

L	T	P	Credits
3	1	0	3.5

Section A

Preparation:Site Clearance, Layout, infra-structural facilities, organizing utilities, site grading Security, safety, legal frame-work, acquisition of land, liaison with local authorities.

Organization:Various levels, job description, role of consultants, contractor and client and their responsibilities, training, Job layout, placement of material equipment on site. Documentation, inspection.

Section B

Mobilization: Machinery, stores equipment, contractor, work-shop, Quarries, vendors

Supervision: Procedure for quality assurance, Controlling and reporting system, Labour laws, legislation

Recommended Books

- 1. R. Sengupta and H. GuhaConstruction Management and Planning, Tata McGraw Hill
- 2. P.K.JoyHand Book for Construction Management, , Mac Milan India Ltd.
- 3. R. PeurofyConstruction Planning, Equipment and Method; McGraw Hill

## CVE 413 GROUND IMPROVEMENT

L	T	P	Credits
3	1	0	3.5

### Section A

Introduction to different methods of ground improvement and its importance Mechanical method of ground improvement, Ruthfuch method; methods based on PI. Ground Freezing, methods, Hydrogeology of frozen soils, strength and behaviour of frozen soils. Ground heating, effect on soil properties, methods.

Drainage Techniques, filter drains, sand drains, sandwicks& band drains, lime columns. Electro-osmosis and Electrochemical stabilization. Compaction & consolidation techniques viz. pre-compression, compaction piles, vibro-compaction (Vibro-floatation, Terra-probe, vibro-replacement, concrete columns & vibro-displacement) Dynamic compaction, explosive compaction.

### Section B

Soil Reinforcement, load transfer mechanism, strength development, anchored earth. In-situ reinforcement techniques viz soil nailing, reticuled micropiles, soil dowels and anchors. Grouts, properties, penetration, clay, Cement clay, Cement, clay-chemical, chemical and Bituminous grouts, grouting methods viz penetration, claquage, compaction & jet.

Reinforced earth; Introduction, Mechanism of reinforced types of reinforcement strength characteristics. Design of reinforced earth retaining walls, abutments, earth slopes. Exclusion techniques viz. sheet piles, contiguous bored piles, secant piles, slurry trenches. Diaphragm walls. Design of stone columns.

### Recommended Books

1. P. Purushotham Raj Ground Improvement Techniques, Tata McGraw Hill, New Delhi.
2. .G. Bell, E & FN Engineering Treatment of Soils F Spon Publishers, UK.
3. M.R. Hausmann Engineering Principles of Ground Modification, McGraw Hill Publishers, New York.
4. W.F. Van Impe., A.A. Balkema Ground Improvement Techniques & their Evolution Publishers, Nehterlands.

## HSS 201 MANAGEMENT PRACTICES & ORGANISATIONAL BEHAVIOUR

L	T	P	Credits
3	1	0	3.5

### Section A

Introduction to Management: Definition, Importance and functions of Management. Theories of Management; Classical, Neo-classical and Modern. Planning: Nature of planning, planning process, types of plans, Importance and Limitations of Planning. Introduction to MBO (Management by Objectives). Social responsibility of business.

Decision Making: Importance and Process. Organization: Process of Organizing, Organizing Principles, Organization Chart, Authority and Responsibility relationship, Steps in Delegation of Authority. Communication: Process, channels, medium of communication, communication barriers. Controlling: Steps, types of control system, essentials of effective control system.

### Section-B

Organizational Behaviors: Concept, features and importance. Personality: determinants and development. Role of Values and Attitudes in individual's behavior. The concept of motivation and its theories. Perception: Concept, Process, Errors in perceptual accuracy, Role of perception in decision making.

Learning: Classical and Operant conditioning theory, Reinforcement-kinds and administration. Concept of group dynamics. Leadership theories and styles. Organizational conflict: Concept, Dimensions, conflict management techniques. Introduction to concept of power and politics in work related organization. Organization culture and effectiveness.

### Recommended Books:

1. Aswathappa, K and Reddy G. Sudarsana, Management and Organisation Behaviour, Himalya Publishing House.
2. Pierce John L., Gardner Donald, Gardner Donald, Management and Organisational Behavior: An Integrated Perspective, Ed.1, Cengage Learning India
3. Laurie Mullins, Management and Organisation Behaviour, 7/e, Pearson Education.
4. Stephen, P. Robbins, Seema Sanghi and Timothy A Judge, Organizational Behavior 13/e, Pearson Education.
5. Stephen P. Robbins, Mary Coulter and Neharika Vohra, Management 10/e, Pearson Education.
6. Heinz, Weihrich and Harold Koontz, Essentials of Management, Tata McGraw Hill.
7. Gene Burton and Manab Thakur, Management Today: Principles and Practice, Tata McGraw-Hill.
8. P.C. Tripathy, P.N. Reddy, Principles of Management, Tata McGraw-Hill.
9. Neeru Vashishth, Principles of Management with case studies, Taxmann Publication.
10. L.M. Prasad, Principles & Practice of Management, Sultan Chand & Sons N Delhi
11. James Stoner, R Edward Freeman and Daniel R Gilbert, Management 6/e, Pearson Education.

**CVE 451 GEOTECHNOLOGY-II LAB**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
<b>0</b>	<b>0</b>	<b>2</b>	<b>1.0</b>

1. Determination of Relative density of coarse grained soils in dry and saturated conditions.
2. Determination of permeability of soil sample.
3. Determination of shear strength of soil by Direct shear test.
4. Determination of Unconfined compressive strength at different compactive effort.
5. Determination of compressibility characteristics of fine grained soils by Consolidation test.
6. Demonstration of bearing capacity by Standard Penetration test.
7. Determination of shear strength of soil by Tri-axial shear test.
8. Demonstration of bearing capacity by Plate load test.

**CVE 451 PROJECT LAB**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2.0</b>

Students are required to work on project in any of the areas related to Civil Engineering. The students will work 4 hrs per week with his / her supervisor(s).

## **B.TECH. FORTH YEAR**

### **(CIVIL ENGINEERING)**

(Batch 2015)

(Session 2018-2019)

### **SCHEME OF PAPERS**

#### **EIGHTH SEMESTER (Civil Engineering)**

<b>S.No.</b>	<b>Course No.</b>	<b>Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
1.	PRJ 451	Industrial training	0	0	0	24

PRJ 451, to be carried out in Industry / Research Institution. The duration training would be six month.

#### **Breakup of Marks:**

##### **Industrial Visit by Faculty Coordinator (150 Marks)**

(Within 10—12 weeks of commencement of Training)

Presentation	: 60 Marks
Viva Voce	: 60 Marks
Report (Hard Copy)	: 30 Marks

Evaluation by Faculty Coordinator is consolation with Industrial Coordinator during industrial visit.

##### **Evaluation by a Team of Faculty Members in the Institute (250 Marks)**

(Within One Week of completion of Training)

Presentation	: 100 Marks
Viva Voce	: 100 Marks
Report (Hard Copy)	: 50 Marks

The Final Presentation and viva – voce will be conducted jointly by the faculty coordinator, external examiner and nominee of the Head to be appointed by the Head of the Department.

The Letter grade will be awarded to the students according to marks obtained by him/her out of total 400 marks.