

MATS School of Engineering & Technology

MATS University

Raipur



Syllabus Scheme
(6th Semester)
For
Bachelor of Engineering
In
CIVIL Engineering

**Subject Code For
MATs School of Engineering & Tech. Deptt.
6th Semester (Civil)**

S.No.	Subject Code	Subject Name
1	BE640	Structural Engineering Design-II
2	BE641	Geo-tech engineering-II
3	BE642	Environmental Engineering-I
4	BE643	Transport engineering-II
5	BE644	Construction Planning And Management
6	Refer table-2	Elective-I
7	BE646	Structural Engineering Design-II Lab
8	BE647	Geo-tech Engg II Lab
9	BE648	Environmental Engineering-I Lab
10	BE649	Concrete Technology Lab

**Table - 2
Professional Elective – I**

S.no	Course code	Subject
1.	BE6451	Concrete technology
2.	BE6452	Composite materials
3.	BE6453	Modern construction materials
4.	BE6454	Foundation engineering
5.	BE6455	Traffic engineering



MATS School of Engineering & Technology
MATS University, Raipur
Scheme of Teaching & Examination
VIth Semester Civil Engineering



S. No.	Course code	SUBJECT	Periods per week		Evaluation Scheme		Total Marks
			L	P	IM	ESE	
THEORY							
1	BE640	Structural Engineering Design-II	5	0	30	70	100
2	BE641	Geo-tech engineering-II	5	0	30	70	100
3	BE642	Environmental Engineering-I	5	0	30	70	100
4	BE643	Transport engineering-II	5	0	30	70	100
5	BE644	Construction Planning And Management	5	0	30	70	100
6	Refer table-2	Elective-I	5	0	30	70	100
PRACTICAL							
7	BE646	Structural Engineering Design-II Lab	0	3	20	30	50
8	BE647	Geo-tech Engg II Lab	0	3	20	30	50
9	BE648	Environmental Engineering-I Lab	0	3	20	30	50
10	BE649	Concrete Technology	0	3	20	30	50

Table - 2

Professional Elective – I

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1.	BE6451	Concrete technology
2.	BE6452	Composite materials
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L-Lecturer, P-Practical, ESE- End Semester Examination, IM-Internal Marks

MATS UNIVERSITY

GULLU, ARANG, RAIPUR

Semester: B.E.6th Sem

Branch:- Civil Engineering

Subject:- Structural Engineering Design-II Code:-BE640

Total Theory Periods: - **40**

Total Tutorial Periods: **10**

Total marks in end semester Exam: **100**

Minimum Number of Class test to be conducted: **02**

Unit 1 Materials and Methods of Analysis

Properties of Structural Steel, I. S. Rolled Sections, I. S. Specifications, Elastic Analysis, Plastic Analysis for steel beams and frames - plastic hinges, Collapse mechanism, plastic modulus, shape factor.

Introduction to working stress method and Limit state method of design of steel structures, types of loads and load combinations.

Unit 2 Fasteners and Tension Members

Riveted, Bolted and Welded Connections, Strength, Efficiency and Design of Joints, Advantages and Disadvantages of Welded Joints, Design of Fillet and Butt Welds, Design of Eccentric Connections, Introduction to high strength friction grip bolts. Net Sectional Area, Design of Axially Loaded Tension Member, Steel Angles under tension

Unit 3 Compression Members and Column Bases

Modes of Failure of a Column, Buckling Failure: Euler's Theory, Effective Length, Slenderness Ratio, Design Formula: I.S. Code Formula, Design of Compression Members, Design of Built-Up Compression Members: Laced and Battened Columns, Slab and Gusseted Bases.

Unit 4 Beams Design Procedure, laterally supported and laterally unsupported beams, Built-Up Sections, Web Crippling, Web Buckling, Curtailment of Flange Plates

Unit 5 Member Subjected To Combined Forces

Design of Member Subjected to combined forces, Eccentricity of Load, Interaction Formulae. Eccentrically Loaded Base Plates.

Name of Text Books:

Design of Steel Structures – Arya, A.S., Ajmani, J.I. (Nem Chand & Bros., Roorkee, U.P.)

Design of Steel Structures – Punmia, Jain & Jain (Laxmi Publications)

Name of Reference Books:

I.S. code of practice on steel structures

Design of Steel Structures – Duggal S.K. (Tata McGraw Hill)

Design of Steel Structures (Vol. - I & II) – Ram Chandra (Standard Book House, New Delhi)

Design of Steel Structures – Dayaratnam (Wheeler Publishing, New Delhi)

Design of Steel Structures – E.H.Gaylord and C.N. Gaylord (McGraw Hill, New York)

Steel Structures: Design and Behaviour – C.G.Salmon and J.E.Johnson (Harper and Row, New York)

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GULLU, ARANG, RAIPUR

Semester: B.E.6th Sem

Subject:- Geotech Engineering-II

Total Theory Periods: - **40**

Total marks in end semester Exam: **100**

Minimum Number of Class test to be conducted: **02**

Branch: - Civil Engineering

Code:-BE641

Total Tutorial Periods: **10**

Unit 1 STABILITY OF SLOPES

Embankment slopes, examples of embankment, road and earth dams, stability analysis for finite and infinite slopes concept of factor of safety, friction circle method, method of slices, Bishop's simplified method, limiting values of factor of safety; critical conditions for the stability of earth dams.

Unit 2 Earth Pressure

Earth Pressure at rest, active and passive earth pressure, computations using Rankine's and Coloumb's earth pressure theories, Rabhann's and Culamaan's graphical method, additional earthpressure due to surcharge and earthquake loading.

Unit 3 SHALLOW FOUNDATIONS AND SETTLEMENTS

Common types of foundations with examples, brief illustration of situations where each one of them is adopted, basis for design, review of major soil parameters used in proportioning of shallow foundations, types and their selection bearing capacity, various method of determination of bearing capacity, computation of bearing capacity in cohesion less and cohesive soils, effect of various factors on bearing capacity, use of field test data, limits of settlement, differential and permissible settlement of footing, rafts on sand using penetration and load test data, estimation of settlement of footing for rigid and flexible, proportioning of footings.

Unit 4 WELL AND PILE FOUNDATIONS

Various types of caissons Situations where adopted, elements of wells, types, method of construction, tilt and shift, remedial measures, bearing capacity and settlement, Terzaghi's lateral stability analysis, Pile Foundation, their types, criteria of selection of piles, outline of steps involved in proportioning, bearing capacity and settlement of single and group of piles, design of pile groups and settlement of pile group in clay, negative skin friction.

Unit 5 MACHINE FOUNDATION, CONTAMINATED AND EXPANSIVE SOIL

Introduction of machine foundation, types of machines and their foundations, Design criteria, Field methods of determining design Parameters, block vibration test, response of block foundations under

vertical vibrations, I.S. code recommendations and foundation on expansive soil, identification of expansive soil, contaminated soil, problems associated with contaminated and expansive soil, design consideration of foundation on expansive soil, CNS soils.

Name of Text Books:

Soil Mechanics and Foundation Engineering – B.C. Punmia (Laxmi
Publication)

Soil Engineering in Theory and Practice (Vol-II) – Alam Singh (Asia
Publishing House, New Delhi)

Name of Reference Books:

Basic and applied Soil Mechanics (Revised Edition) – Gopal Rajan and Rao
A.S.R. (New Age, New Delhi. 1998)

Foundation Engineering (2nd Edition) – Peck,R.B., Hanson (W.E. and
Thornburn. W.H. Johan Wiley,New York 1976)

Foundation design and Construction (5th Edition) – Tomlinson, M.J. (ELBS,
Singapore. 1988)

Foundation Analysis and Designing – J.E. Bowles (McGraw Hill, New Delhi)

Soil Engineering in Theory and Practice (Vol. - II) – Alam Singh (Asia
Publishing House, New Delhi,1981)

Physical Methods of Soil Characterisation – J. Behari (Narosa Publishing Hall,
New Delhi)

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Semester: B.E.6th Sem

Subject:- Environmental Engineering-I

Total Theory Periods: - **40**

Total marks in end semester Exam: **100**

Minimum Number of Class test to be conducted: **02**

Branch:- Civil Engineering

Code:-BE642

Total Tutorial Periods: **10**

Unit 1 INTRODUCTION

Necessity and importance of water supply schemes.

Water demand

Classification of water demands, Estimation of quantity of water required by a town, per capita demand, factors affecting per capita demand, design period and population forecasting, variation in water demand.

Sources of water supply

Surface sources and underground sources, Intake works, site selection, type of intake works.

Unit 2 QUALITY OF WATER

Common impurities, physical, chemical and biological characteristics of water, water quality standards for municipal and domestic supplies.

Water Processing

Object of water processing, flow diagrams of typical ground water system and surface water systems.

Sedimentation

Theory of sedimentation, sedimentation tanks and its types, design parameters related with sedimentation tanks, sedimentation with coagulations, coagulants and coagulant aids, Jar test for determining coagulant dosage.

Unit 3 Filtration

Theory of filtration, slow sand and rapid sand filters, Construction and operation.

Disinfection

Methods of disinfection, Chlorination, Types of chlorination, Break Point chlorination.

Unit 4 Softening

Methods of Softening, Iron Removal, Fluoridisation.

Distribution System

Methods of distribution, layout of distribution system, methods of analysis, pressure in the distribution system, distribution reservoirs, functions and its types, storage capacity of distribution reservoir.

Unit 5 Air Pollution

Introduction, causes, sources, characteristics, effects of air pollution on plants, humans, animals and materials and atmosphere, air pollution control methods and equipment.

Noise Pollution

Definition, sources, effects of noise pollution on humans, animals and non-living things, methods of noise control.

Name of Text Books:

Water Supply Engineering – S.K. Garg (Khanna Publication).

Water Supply Engineering – B.C. Punmia (Laxmi Publication, New Delhi)

Name of Reference Books:

Environmental Engineering – Peavy & Rowe (Tata McGraw Hill, New Delhi).

Water Supply and Sanitary Engineering – G.S. Birdi (Dhanpat Rai Publications).

Introduction to Environmental Science – Y. Anjaneyulu (B.S. Publications)

Environmental Science and Engineering – Henry and Heinke (Pearson Education)

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Semester: B.E.6th Sem

Branch:- Civil Engineering

Subject:- Transportation Engineering-II Code:-BE643

Total Theory Periods: - **40**

Total Tutorial Periods: **10**

Total marks in end semester Exam: **100**

Minimum Number of Class test to be conducted: **02**

Unit 1

Historical development of railway in India. Merits of rail transportation, gauges and gauge problems, railway track cross sections, coning of wheels, rail cross sections, weight of rail, length of rail, wear of rails, Creep of rails, rail joints and welding of rails, advantages of welding.

Unit 2

Sleepers

Requirements, various types, spacing and density, rail fixtures, fastenings.

Ballast

Requirements, various types.

Geometrics

Grading, cant and cant deficiency, transition curves, widening of gauges on curves.

Unit 3

Points and Crossings, design of turnouts, various types of track junctions, signaling and interlocking, classification of signals, control of movements of trains, interlocking of signal and points.

Unit 4

Tunnel Engineering

Consideration in tunneling shape and size, methods of tunnel, constructions, tunneling in soft soil and rocks, lining of tunnels, ventilations, drainage of tunnels.

Unit 5

Harbour Engineering

Harbour layout, harbour works, break water, jetties, wharves, piers and berthing facilities, navigational aids, port facilities, docks, transit sheds and ware houses, general layout of a port.

Name of Text Books:

Railway Engineering – S.C. Saxena & Arora (Dhanpat Rai Publications)

Tunneling Engineering – S.C. Saxena (Dhanpat Rai Publications)

Railway Engineering – Rangawala (Charotar Publications)

Name of Reference Books:

Harbour Engineering – Srinivas (-----)

Tunnel and Harbour – Seetharaman S. (Umesh Publications)

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GULLU, ARANG, RAIPUR

Semester: B.E.6th Sem

Branch: - Civil Engineering

Subject: Construction Planning & Management Code:-BE644

Total Theory Periods: - **40**

Total Tutorial Periods: **10**

Total marks in end semester Exam: **100**

Minimum Number of Class test to be conducted: **02**

Duration of end semester exam: 3 hours

Unit 1

Introduction

Objectives and functions of project management, project feasibility reports, Planning for construction projects, Cost control in construction-importance, objectives of cost control, cost control systems.

Unit 2

Scheduling

Scheduling Job layout and Line of balance, project management through networking PERT, CPM

Unit 3

Safety and Quality Control

Importance, causes of Accidents safety measures, responsibility for safety, safety benefits to various parties. Quality control in construction: Importance, Elements of quality, Quality Assurance Techniques, Quality Control Circles. Total Quality Management in construction, Introduction, Elements of TQM, Approaches to total quality, difference between traditional management and TQM, Applications and constants of TQM in construction process.

Unit 4

Economics of Project management

Economic analysis of engineering projects, economic studies, sensitivity analysis, Introduction to Management Information System (MIS)- definition, outline of MIS.

Unit 5

Construction Equipments and Management

Classification of construction equipments, earth moving equipments, hauling equipments, hoisting equipments, aggregate and concrete production equipments, pile driving equipments, time and motion studies, waiting line theory, Need for mechanisation, financing aspects, factors affecting selection of construction equipments, cost of owning and operating the construction equipment, role of operation research in equipment management, equipment maintenance.

Name of Text Books:

Construction Engineering and Management – S. Seetharaman (Umesh Publications, New delhi, 1997)
PERT & CPM – Punmia, B.C. and Khandelwal, K.K. (Laxmi Publications, New Delhi 1997)
Construction Management and Planning – Sen Gupta & Guha (Tata McGraw Hill)

Name of Reference Books:

Construction Planning Equipment and Methods – Peurify/ Schexnayder, 6th Edition (Tata McGraw Hill)
PERT & CPM – Sreenath, I.S. (East West Press, New Delhi, 1975)
Construction Management and Accounts – Vazirani,V.N. & Chandola, S.P. (Khanna Publishers, New Delhi, 2002)
Construction Planning and Management – Gahlot & Dhir (New Age Publisher)

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Semester: B.E.6th Sem

Branch:- Civil Engineering

Subject: Structural Engineering design II-Lab

Code:-BE646

Experiments to be performed (Min 10 experiments)

1. Introduction to latest version of a Standard Structural Engineering Design Package such as STAAD Pro.
2. Geometrical Modelling of RCC Frame on latest version of a Standard Structural Engineering Design Package such as STAAD Pro.
3. Modelling of loads and load combinations on RCC Frame on latest version of a Standard Structural Engineering Design Package such as STAAD Pro.
4. Analysis and Interpretation of Results of Analysis of RCC Frame on latest version of a Standard Structural Engineering Design Package such as STAAD Pro.
5. Design of RCC Frame on latest version of a Standard Structural Engineering Design Package such as STAAD Pro.
6. Interpretation of Results of Design of RCC Frame on latest version of a Standard Structural Engineering Design Package such as STAAD Pro.
7. Geometrical Modelling of Steel Frame on latest version of a Standard Structural Engineering Design Package such as STAAD Pro.
8. Modelling of loads and load combinations on Steel Frame on latest version of a Standard Structural Engineering Design Package such as STAAD Pro.
9. Analysis and Interpretation of Results of Analysis of Steel Frame on latest version of a Standard Structural Engineering Design Package such as STAAD Pro.
10. Design of Steel Frame on latest version of a Standard Structural Engineering Design Package such as STAAD Pro.
11. Interpretation of Results of Design of Steel Frame on latest version of a Standard Structural Engineering Design Package such as STAAD Pro.
12. Design of R.C.C. Column on latest version of a Standard Structural Engineering Design Package such as STAAD.etc
13. Design of R.C.C. Isolated Footing on latest version of a Standard Structural Engineering Design Package such as STAAD.etc
14. Case Study of design of a RCC Multistorey Building on latest version of a Standard Structural Engineering Design Package such as STAAD Pro.
15. Case Study of design of a Steel Industrial Building on latest version of a Standard Structural Engineering Design Package such as STAAD Pro.

List of Equipments / Machine Required:

Latest Release of Software Package STAAD Pro (Research Engineers International, Kolkata)

Latest Release of Software Package STAAD.etc (Research Engineers International, Kolkata)

Recommended Books:

- (1) Reference Manual for Respective Software
- (2) Verification Manual of Respective Software

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Semester: B.E.6th Sem

Branch:- Civil Engineering

Subject: Geotech Engineering -II lab

Code:-BE647

Experiments to be performed (Min 10 experiments)

1. Determination of water content dry density relation using light-compaction test.
2. Determination of water content dry density relation using heavy compaction test.
3. To determine California Bearing Ratio for the designing of pavements, laboratory determination of CBR test.
3. To determine in-situ bearing value of subgrade by North Dakota Cone Apparatus.
4. Direct Shear Test on the (1) Dry cohesionless / cohesive soil specimen remoulded / unremoulded (2) Direct shear test – undrained test, direct shear test-consolidated undrained.
5. Triaxial Compression Test (Triaxial compression test): (a) UU, (b) CU, (c) CC.
6. Determination of Unconfined Compression Strength of cohesive soils (Remoulded / Unremoulded)
7. Laboratory Vane Shear Test (Remoulded / Unremoulded)
8. Consolidated test (Remoulded / Unremoulded) Consolidated test (Fixed Ring / Floating Ring).
9. To determine swelling pressure of purely cohesive soil (Remoulded / Unremoulded specimen)
10. Determination of density index (relative density) of cohesionless soils.
11. Study of standard penetration.
12. Determination of bearing capacity of soil by plate load.

List of Equipments / Machine Required:

Light Compaction Mould

Heavy Compaction Mould

Oven

CBR Apparatus

North Dakota Cone Apparatus

Direct Shear Test Apparatus with full accessories

Triaxial Compression Test Apparatus with full accessories

Consolidometer Apparatus

Unconfined Compression Test Apparatus

Swell Pressure Test Apparatus

Standard Penetration Test Apparatus with full accessories

Plate Load Test Apparatus with full accessories

Soil Sampling Tube

Recommended Books:

Soil Mechanics and Foundation Engineering – B.C. Punmia (Laxmi Publication)

Soil Engineering in Theory and Practice (Vol-II) – Alam Singh (Asia Publishing House, New Delhi)

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Semester: B.E.6th Sem

Branch:- Civil Engineering

Subject: Environmental Engineering-I Lab

Code:-BE648

Experiments to be performed (Min 10 experiments)

1. To determine acidity of water sample.
2. To determine alkalinity of water sample.
3. To determine hardness of water sample.
4. To determine chloride content of water sample.
5. To determine D.O. content of water sample.
6. To estimate the quantity of BOD from water sample.
7. To determine the availability of chlorine in bleaching powder.
8. To determine the residual quantity of Cl₂ Content.
9. Determination of quantity of Optimum Coagulant Dose.
10. Determination of Break Point Chlorination.
11. Determination of Total Solids.
12. Determination of Turbidity.
13. Determination of particulates in air.
14. Determination of MPN.
15. Determination of pH of water.

List of Equipments / Machine Required:

BOD Incubator

Dust Sampler

Turbidity meter

Microscope

pH meter

Muffle Furnace

Hot Air Oven

Jar Test Apparatus

Name of Text Books:

Environmental Engineering Lab Manual – Dr. B. Kottaiah & N. Kumaraswamy (Charotar Publications)

Water Supply Engineering – S.K. Garg (Khanna Publication).

Water Supply Engineering – B.C. Punmia (Laxmi Publication, New Delhi)

Environmental Science and Engineering – Henry and Heinke (Pearson Education).

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Semester: B.E.6th Sem

Branch:- Civil Engineering

Subject: Concrete Technology Lab Practical Code: BE649

Experiments to be performed (Min 10 experiments)

1. Determination of Strength of concrete
2. Determination of Workability by compaction factor
3. Determination of Slump test for a concrete mix
4. Determination of workability by Veebee test
5. Determination of workability by Flow table test
6. Determination of Modulus of elasticity of concrete and strain measurement by longitudinal compressometer
7. Determination of Soundness test on aggregate
8. Determination of Deleterious materials in fine aggregate
9. Determination of flexural strength of concrete
10. Mix Design by I.S. Code method (with OPC Cement)
11. Mix Design by I.S. Code method (with Slag Cement)
12. Mix Design by I.S. Code method (with Admixtures Cement)
13. Determination of grading curve of Mix aggregate & sieve analysis
14. Determination of Compressive strength of concrete by non destructive test – Rebound Hammer

List of Equipments / Machine Required:

Slump Cone with Tamping Rod
Concrete Cubes (15 x 15 x 15) cm³
Tray (45 x 60) cm², (60 x 60) cm², (30 x 45) cm²
Trowel (6 Nos.)
I.S. Sieves for Coarse and Fine Aggregate
Compression Testing Machine (200 T)
Weighing Balance
Sieve Shaker
Compaction Factor Test Apparatus
Vee-Bee Consistometer
Flow Table
Longitudinal Compressometer
Cylindrical Mould
Concrete Test Hammer
Graduated Glass Cylinder (500 ml, 1000 ml)
Beaker (500 ml)
Rebound Hammer

Recommended Books:

Lab Manual Concrete – M.L. Gambhir (Tata McGraw Hill)
Concrete Technology – M.S. Shetty (S. Chand & Co.)
Concrete Technology – M.L. Gambhir (Tata McGraw Hill)

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Semester: B.E.6th Sem
Subject: Concrete Technology

Branch:- Civil Engineering
Code: BE6451

Unit 1

Concrete Making Materials

Aggregates classification, IS Specifications, Properties, Grading, Methods of combining aggregates, specified gradings, Testing of aggregates, Types of Fibers.

Cement, Grade of cement, Chemical composition, Testing of concrete, Hydration of cement, Structure of hydrated cement, Special cements

Unit 2

Properties of Concrete and Admixtures

Properties of fresh concrete, Hardened concrete, Strength, Elastic properties, Creep and shrinkage, Variability of concrete strength. Water Chemical admixtures, Mineral admixture.

Unit 3

Concrete Mix Design

Principles of concrete mix design, Methods of concrete mix design, Testing of concrete.

Unit 4

Special Concrete

Light weight concrete, Fly ash concrete, Fibre reinforced concrete, Polymer Concrete, Super plasticized concrete, Epoxy resins and screeds for rehabilitation - Properties and Applications - High performance concrete.

Unit 5

Concreting Methods

Process of manufacturing of concrete, methods of transportation, placing and curing - Extreme weather concreting, special concreting methods, Vacuum dewatering - underwater concrete, special form work.

Name of Text Books:

Properties of Concrete – Neville, A.M., (Pitman Publishing Limited, London)

Concrete Technology – Shetty M.S., (S.Chand and Company Ltd. Delhi)

Name of Reference Books:

Light Weight Concrete Academic Kiado – Rudhani G. (Publishing Home of Hungarian Academy of Sciences, 1963)

Concrete Technology – M.L. Gambhir (Tata McGraw Hill)

Concrete Technology – R.S. Varshney (Oxford, IBH Publishers)

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Semester: B.E.6th Sem
Subject: Composite Materials

Branch:- Civil Engineering
Code: BE6452

Unit 1

Introduction, Historical background, Technological Applications, Composites – various reinforcement and matrix materials, Classification of composites.

Unit 2

Forms of fibre reinforcement, Comparisons of composites with R.C.C. and metals, Strength and stiffness properties, Effective moduli.

Unit 3

Fibre reinforced composite materials, Manufacturing Technique, Cost and Weight advantages.

Unit 4

Behaviour of uni-directional, cross-ply, angle-ply and other composites-strength and stiffness, anisotropy, Generalized Hooks law. Laminates-Laminated Plates, Analysis, Strength and design with composites, Fibre reinforced Pressure vessels.

Unit 5

Laminates-Laminated Plates, Analysis, Strength and design with composites, Fibre reinforced Pressure vessels.

Name of Text Books:

Mechanics of Composite Materials – Robert M.Jones (Taylor & Francis, Philadelphia, 1998)

Fibre Reinforced Composites – P.K. Mallick (Marcel Dekker, Inc., New York, 1993)

Name of Reference Books:

Introduction to Design and Analysis with Advanced Composite Materials – Stephen R. Swanson (Prentice Hall, New Jersey, 1997)

Stress Analysis of Fiber-Reinforced Composite Materials – M.W. Hyer (WCB McGraw Hill, New York, 1998)

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Semester: B.E.6th Sem
Subject: Modern Construction Materials

Branch:- Civil Engineering
Code: BE6453

Unit 1

Concretes: High strength and High performance concrete-Fiber Reinforced concrete

Unit 2

Metals: New Alloy steels-Aluminium and its products-Other alloys

Unit 3

Composites: Plastics-Reinforced polymers-FRP-Celular cores

Unit 4

Other Materials : Water proofing compounds-Non -weathering Materials-Flooring and Facade Materials .

Unit 5

Smart and Intelligent Materials: Brief outline and uses

Name of Text Books:

Civil Engineering Materials (2nd Edititon) – Shan Somayaji (Prentice Hall Inc., 2001)

Materials for Civil and Construction Engineers – Mamlouk, M.S. and Zaniewski, J.P.
(Prentice Hall Inc.,1999)

Name of Reference Books:

Materials for Civil and Highway Engineers (4th Edition) – Derucher, K.Korfiatis. G. and Ezeldin, S.(Prentice Hall Inc., 1999)

High Performance Concrete – Aitkens (McGraw Hill, 1999)

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Semester: B.E.6th Sem
Subject: Foundation Engineering

Branch:- Civil Engineering
Code: BE6454

UNIT 1

Site Investigation and Selection of Foundation

Introduction, Scope and objectives, Method of exploration boring, Sampling, disturbed and undisturbed sampling, sampling techniques, Bore log and report, Penetration tests (SPT and SCPT), Data interpretation, Selection of foundation based on soil condition.

Unit 2

Shallow Foundation

Introduction, Location and depth of foundation, codal provisions, bearing capacity of shallow foundation on homogeneous deposits, bearing capacity from insitu tests, Factors influencing bearing capacity, codal provisions, Settlement, Components of settlement, Settlement of foundations on granular and clay deposits, Allowable and maximum differential settlements of buildings, Codal provision, Methods of minimizing settlement.

Unit 3

Footings and Rafts

Types of foundation, structural design of spread footing, Design aspects of combined and mat foundation, Codal provisions.

Unit 4

Piles

Types of piles, Factors influencing the selection of pile, Carrying capacity in granular and cohesive soils, Static and dynamic formulae, Capacity from insitu tests (SPT and SCPT), Piles subjected to uplift, Negative skin friction, Group capacity, Settlement of pile groups, Interpretation of pile load test, Pile caps, Codal provisions.

Unit 5

Retaining Walls

Earth pressure theory, Plastic equilibrium in soils, active and passive states, Rankine's theory, Coloumb'swedge theory, Classical and limit equilibrium solution, Earth pressure on retaining walls of simple configurations, pressure on the wall due to single line load alone, Graphical method (Culmann's method alone), Stability of retaining wall.

Name of Text Books:

Soil mechanics and foundations – Punmia, B.C. (Laxmi publications Pvt. Ltd., New Delhi, 1995)

Soil Mechanics and Foundation Engineering – Arora, K.R. (Standard publishers and distributors, New Delhi, 1997)

Name of Reference Books:

A Textbook of Geotechnical Engineering – Khan, I.H., (Prentice Hall of India, New Delhi, 1999)

Basic and applied soil mechanics – Gopal Ranjan and Rao, A.S.R. (Wiley Eastern Ltd., New Delhi (India), 1997)

Foundation Analysis and Design – Bowles J.E. (McGraw Hill, 1994)

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Semester: B.E.6th Sem
Subject: Traffic Engineering

Branch:- Civil Engineering
Code: BE6455

Unit 1

Introduction

3E's of traffic Engineering, Special problems due to mixed traffic and other conditions in developing countries, Concept of PCU.

Unit 2

Traffic Characteristics

Road user characteristics, Vehicular characteristics, Traffic flow characteristics, Capacity, Traffic studies, Volume, Spot speed, Speed and delay, Origin and destination, Parking and accident.

Unit 3

Traffic Operations

Traffic regulations, Controls on vehicles, Drivers and flow, One way street tidal flow operation, priority for high occupancy vehicles, Traffic control devices, Signs, Signals, Islands and markings, Design of isolated traffic signals by IRC method.

Unit 4

Traffic Safety

Analysis of traffic accidents, Highway lighting, Effect of road conditions and road geometrics on traffic safety, Traffic safety awareness.

Unit 5

Traffic and Environment

Pollution problems of cities, Noise pollution, Air pollution, Vibration, Environmental Impact Assessment, Mitigative Measures.

Name of Text Books:

Traffic Engineering – McShane, W.R. and Roes, R.P. (Prentice Hall, New Jersey, 1990)

Traffic Engineering and Transport Planning – Kadiyali, L.R. (Khanna Publishers, Delhi, 1996)

Name of Reference Books:

Transport Planning and Traffic Engineering – Flaherty, CAO'(Ed.) (John Wiley & Sons, Inc., New York, 1997)

Traffic Flow Fundamentals – May, A.D. (Prentice Hall, Englewood Cliffs, New Jersey, 1990)