CE 801 A/B Architecture & Town Planning

Module I

Module II
Functional Planning of Buildings: Occupancy classification of buildings – general requirements of site and building- building codes and rules – licensing of building works. Functional planning of buildings such as residential, institutional, public, commercial and industrial buildings – the process of identifying activity area & linkages – drawing built diagrams – checking for circulation, ventilation, structural requirements and other constraints – preparing sketch plans and working drawing – site plants. Consideration of comfort factors such as acoustics, lighting, ventilation and thermal aspects.

Module III

Module IV

Reference
1) Barister Fletcher – A History of world Architecture
2) Ernest Pickering - Architecture Design
3) G.K. Hiraskar – Great Ages of World Architecture
4) Rangwala - Town Planning –Charotar Publishing House
5) Satish Chandra Agarwala - Architecture & Town Planning –Dhanpat Rai & Co (P) Ltd

Type of Questions for University Exam.
Q 1.Eight short answer questions of 5 marks with two questions from each of the four modules.
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.
CE 802A/B Construction Safety & Fire Engineering

Module I
Introduction to Construction Industry and Safety: Basic concepts – accident – injury –lost time accidents, reportable accident, frequency rate, severity rate, incidence rate.

Technological, Organisation and Behavioral Aspects of safety in construction. Human factors that are Impediments to safety in construction. Roles of different groups in ensuring safety, health, welfare and social security. Steps to be taken in construction sites in case of accidents. Introduction to ergonomics and its relevance to construction.

Module II
Safety in various construction operations such as soil excavation, rock blasting, dewatering, piling, demolition, working at heights-ladders and scaffolds, working in confined spaces. Safety in electrical works at construction site.

Safety in storage, stacking and handling of construction materials-cement, lime, aggregates, bricks and blocks, steel, glass, paint and varnish, flammable and hazardous materials used at sites.
Safety in the operation of construction equipments- excavators, trucks, tower cranes, mobile cranes, lifting tackles, chain and pulley. Personal protective equipment’s for construction.

Module III
Classification of fire. Effect of high temperature on the properties of concrete, steel, masonry, wood. Fire damage to concrete, steel, masonry and timber. Repair techniques to the fire damaged reinforced concrete columns, beams, slabs and to the steel structural members.

Module IV
Design principles of fire resistant walls.
Classification of buildings based on occupancy, types of construction as per National Building code of India; Fire zones; General Requirements of fire protection for all individual occupancies.
Life safety aspects of building fires – Exit Requirements as per NBC of India. Requirements other than general requirements for buildings of different occupancy classification.

References
2. Smith & Harmathy : Design of Buildings for Fire Safety

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks with two questions from each of the four modules.
Q 2. to Q 5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.
CE 803A/B Retrofitting and Rehabilitation of Structures

Module I
Concept of Repairing – retrofitting – strengthening – rehabilitation – restoration – remoulding

Module II

Module III

Module IV
Retrofitting of Steel Structure: Rain water protection – drainage in structural members – preparation of surface by sand blasting – protective coatings – Cathodic protection – Sacrificial metal – adding additional plates strengthening the joints – concrete jacketing

References
2) Balachandran and Margrab – Vibrations – Thomason Books Cole
3) A.R.Santhakumar – Concrete Technology , Oxford University Press New Delhi

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks with two questions from each of the four modules.
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.
CE804(A/B)(a) Bridge Engineering

Module I

Module II

Module III
Concrete Bridges for Road Transport: Design of simply supported solid slab bridge – Dispersion of load along the span – design of slab – Design of Girder Bridge – Design of deck slabs – design of longitudinal girders – Courbon’s method – Design of bearings
Steel Bridge for Railways: Steel girder design

Module IV

References

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks with two questions from each of the four modules.
Q 2. to Q. 5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.
CE 804 A/B (b) COST EFFECTIVE BUILDING TECHNIQUES

Module I
Cost Reduction Techniques – Planning aspects
Innovative techniques for foundation- ground improvement by rope drains-bamboo reinforcement-sand piles- Brick arch foundation- stub foundation Foundations in weak soil deposits

Module II

Module III
Innovative techniques for roofing- Funicular shells-Precast reinforced concrete channel units- Precast reinforced concrete cored units- Prestressed concrete hollow cored units- Precast RCC joists flooring/roofing systems- roofing system with cellular units- Reinforced brick panel roofing system-Two-way spanning flooring system using precast units- Cellular light weight concrete roofing units- Ferro cement ribbed slabs and folded plates- Filler slabs . Innovative roofing technology- Filler slabs (Practical assignment)

Module IV
Mud Construction – Mud as building and building material – Field tests for identification of suitable soil for mud construction- Techniques for mud stabilization.- Techniques of mud construction- finishes and protective treatments

Mud Construction- Production of mud blocks (Practical assignment)

Module IV

Prefabrication- Ferro-cement slab (Practical assignment)

References:
1) A.G Madhava Rao and D.S Ramachandra Murthy : Appropriate Technologies for Low cost housing
2) Mohan Rai and M.P Jaisingh: Advances in building materials and construction, CBRI Rookie Publications
4) D.J.Perry & P.S.Brandew : Cost planning of buildings.

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks with two questions from each of the four modules.
Q 2. to Q 5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.
CE 804A/B (c) Ground Improvement Techniques

Module I
Introduction to Ground improvement techniques: Role of ground improvement in foundation engineering- Geotechnical problems in alluvial, lateritic and black cotton soils
Drainage and Dewatering: well point system, shallow & deep well system, vacuum dewatering, electro osmosis

Module II
In-situ densification methods in granular soils: Introduction-mechanical stabilization-deep dynamic compaction-vibro compaction- blasting
In-situ densification methods in cohesive soils: Preloading- Concept of three dimensional consolidation –sand drain design and methods of their installation – fabric drains-stone columns & lime piles (installation techniques only)

Module III
Earth Reinforcement- Concept of reinforced earth –load transfer mechanism and strength development – Stability analysis of reinforced earth retaining walls-external stability analysis, internal stability analysis (brief mention about the methods only) - application areas.

Geosynthetics: Classification- Functions of geotextiles as separators, reinforcement, filters and in drainage-damage and durability of geotextiles.

Module IV
Introduction to grouts and grouting- basic functions -Classification of grouts -Grout ability Ratio
Properties of grouts: viscosity, fluidity, stability, rigidity, thixotropy, permeance
Grouting applications: seepage control in soil and rock under dams- seepage control in soil for cut off walls –stabilization grouting for underpinning
Cement and lime stabilization: cement stabilization-types of soil cement-factors affecting soil cement mixing
Lime stabilization-effect of lime on soil properties

Reference
1) M.J. Tomlinson - Foundation design and construction
3) C.J.F.P Jones - Earth Reinforcement and soil structures,Buuterworths
4) Purushothama Raj.P – Ground Improvement techniques ,Laxmi Publications(P) Ltd., New Delhi

Type of Questions for University Exam.
Q 1.Eight short answer questions of 5 marks with two questions from each of the four modules.
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.
CE 804A/B (d) Remote Sensing & GIS

**Module I**


**Module II**

**Module III**

**Module IV**

**References**
3) Burrough & McDonnel : Principles of GIS, Oxford University Press
4) Heywood J, Cornelius S & Carver S An Introduction to GIS, Pearson Education

*Type of Questions for University Exam.*

Q 1. Eight short answer questions of 5 marks with two questions from each of the four modules.
Q 2. to Q. 5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.
CE 804A/B (e) Industrial Waste Engineering & Management

Module I
Effect of industrial waste on stream, land and air, Stream quality criteria for public water supply and effluent standards, characterisation studies, Variation in wastewater flowrates and constituents, Objective of wastewater treatment, Plant analysis and design, General layout of an effluent treatment plant, Volume reduction, Strength reduction, Neutralisation, Equalisation and Proportioning.

Module II

Module III
Physico–chemical treatment methods, Application of sedimentation, coagulation, flocculation, adsorption, chemical precipitation, ion exchange, reverse osmosis and electrodialysis process, Biological treatment methods, Principle, Attached and suspended culture systems, modification of activated sludge process, rotating biological contactors, biotower, stabilisation pond, oxidation ditch, aerated lagoon, sequencing batch reactors. Conventional and high rate anaerobic treatment concept of anaerobic contact process, anaerobic rotating biological contractors, Anaerobic Expanded/Fluidised bed reactors, Upflow anaerobic sludge blanket reactors and modifications.

Module IV

References
6) Vesilind, Worrell and Reinhart – Solid Waste Engineering, Tomson Brook Cole

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks with two questions from each of the four modules.
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.
CE 805A Building Technology and NDT Lab

Building Science Laboratory

1) wind flow using anemometer
2) temperature contours inside a room using digital thermometer
3) sound intensity contours inside a room
4) light intensity contours inside a room
5) humidity measurement inside a room
6) shadow in a building model

Nondestructive Testing Laboratory

1) Ultrasonic Pulse velocity test -concrete
2) Rebound hammer test -concrete
3) Penetration resistance -concrete
4) Core sampling -concrete

Note: 50% marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be assessed by two examiners. A candidate shall secure a minimum of 50% marks separately for the two components to be eligible for a pass in that subject.
CE 805(B) INDUSTRIALLY ORIENTED PROJECT

Each batch of around 5 students shall identify a field oriented project

- A detailed project report in the prescribed formal shall be submitted at the end of the semester. All test results and relevant design and engineering documentation shall be included in the report
- The work shall be reviewed and evaluated periodically

The final evaluation of the project shall be done by a team of minimum 3 internal examiners including the project guide and shall include the following.
- Presentation of the work
- Oral examination
- Quality and content of the project report

Guidelines for evaluation:

i. Regularity and progress of work 50
ii. Work knowledge and involvement 75
iii. End semester presentation and oral examination 75
iv. Project Report – Presentation style and content 50

Total 250

Note: Points (i) and (ii) to be evaluated by the respective project guide and the project coordinator based on continuous evaluation(iii)-(iv) to be evaluated by the final evaluation team comprising of 3 internal examiners including the project guide.
CE 806 A PROJECT

Each batch of students shall develop the project started during the VII semester.

- A detailed project report in the prescribed format shall be submitted at the end of the semester. All test results and relevant design and engineering documentation shall be included in the report
- The work shall be reviewed and evaluated periodically

The final evaluation of the project shall be done by a team of minimum 3 internal examiners including the project guide and shall include the following.

- Presentation of the work
- Oral examination
- Quality and content of the project report

Guidelines for evaluation:

i. Regularity and progress of work 50
ii. Work knowledge and involvement 50
iii. End semester presentation and oral examination 50
iv. Project Report – Presentation style and content 50

Total 200 marks

Note: Points (i) and (ii) to be evaluated by the respective project guide and the project coordinator based on continuous evaluation (iii)-(iv) to be evaluated by the final evaluation team comprising of 3 internal examiners including the project guide.

CE 806B / 807A VIVA - VOCE

Each student is required to appear for a viva-voce examination at the end of the complete course work. The examination panel shall comprise of a minimum of one internal examiner and one external examiner, both appointed by the University. The examiners shall evaluate the students in terms of their conceptual grasp of the course of study and practical/analysis skills in the field. The students shall produce the seminar report and project reports duly attested by the institutional authorities, before the examiners