MVCT/MVCP – 301(A) Advanced Highway Construction

1. Earthwork and Soling :
Classification of types of highway construction, Suitability of each type under Indian conditions. Selection of base course and surface course.

Selection of soils, construction of embankments, excavation and compaction equipments. Field and laboratory tests for quality control. Stone soling, brick soling, current practices.

Construction of earth roads, gravel roads, soil stabilised roads, water bound macadam. Paved roads (i) bricks (ii) stones.

2. Bituminous Construction:
Properties, requirements and specifications of materials, equipments and plants. Detailed construction procedure of each type. Field and laboratory tests for quality control. Choice of binders under different conditions. IRC, British, and MOST Specifications. Bituminous surface treatments, interface treatments-primecoat, and tackcoat, surface dressing and seal coat, grouted or penetration macadam, bituminous bound macadam, Sheet asphalt, bituminous concrete, mastic asphalt, dense tar surfacing.

3. Cement Concrete Road Construction :
Necessity of providing a base course under cement concrete road construction. Selection of materials, constructions methods, detailed construction procedure, Quality control tests (Lab. and Field). Construction equipments. Classification of various types of joints, necessity of providing each type, method of construction of joints, load transfer devices, dowel bars, tie bars. joints filler and sealer materials, IRC Specifications.

4. Reinforced Cement Concrete Road Construction :
Necessity of providing reinforcement in cement concrete pavements, continuously reinforced concrete pavements, prestressed concrete pavements and fibre reinforced concrete pavements. Selection of the mix, compaction method and construction prucedure for each type. Recommendations under Indian conditions.

5. Construction Planning and Management :
CPM/PERT in Highway Construction.

W.e.f. Academic Session 2013-14

MVCT/MVCP – 301(B) Multi Storeyed Buildings

1. Structural systems and their suitability, structural design criteria in planning.

2. Multistoried Buildings, Preliminery design, Analysis of building frames for vertical and lateral loads by approximate method, Matrix methods for the analysis of building frames & computer programming for the same.

3. Analysis of Shear Walled Buildings Design ofsections in reinforced concrete by working stress and limit state methods, Detailing of joints.

4. Yield line Analysis of reinforced concrete slabs, concept of moment redistribution.

5. Foundation - Superstructure interaction, Earthquake effects and design for ductility.

W.e.f. Academic Session 2013-14

MVCP – 301(C) Maintenance and Rehabilitation of Structure

UNIT I

Influence on serviceability and durability Quality assurance for concrete construction as built concrete properties strength, permeability, thermal properties and cracking, Effects due to climate, temperature, chemicals, wear and erosion, Design and construction errors, corrosion mechanism, Effects of cover thickness and cracking, methods of corrosion protection, corrosion inhibitors, corrosion resistant steels, coatings, cathodic protection.

UNIT II

Special materials for repair Special concretes and mortar, concrete chemicals, special elements for accelerated strength gain, Expansive cement, polymer concrete, sulphur infiltrated concrete, ferro cement, Fibre reinforced concrete. Rust eliminators and polymers coating for Rebars,foamed concrete

UNIT III

Maintenance and repair strategies Definitions : Maintenance, repair and rehabilitation, Facets of Maintenance importance of Maintenance Preventive measures on various aspects Inspection, Assessment procedure for evaluating a damaged structure causes of deterioration - testing techniques,

UNIT IV

Techniques for repair Mortar and dry pack, vacuum concrete, Gunite and Shotcrete Epoxy injection, Mortar repair for cracks, shoring and underpinning, Repairs to overcome low member strength,Deflection, Cracking, Chemical disruption, weathering wear, fire, leakage, marine exposure, Engineered demolition techniques - case studies

MVCP – 301(D) Operations Management

UNIT I

INTRODUCTION TO PRODUCTION AND OPERATIONS MANAGEMENT Production Systems – Nature, Importance and organizational function. Characteristics of Modern Production and Operations function. Organisation of Production function. Recent Trends in Production and Operations Management. Role of Operations in Strategic Management. Production and Operations strategy – Elements and Competitive Priorities. Nature of International Operations Management.

UNIT II

FORECASTING, CAPACITY AND AGGREGATE PLANNING Demand Forecasting – Need, Types, Objectives and Steps. Overview of Qualitative and Quantitative methods. Capacity Planning – Long range, Types, Rough cut plan, Capacity Requirements Planning (CRP), Developing capacity alternatives. Aggregate Planning – Approaches, costs, relationship to Master Production schedule. Overview of MRP, MRP II and ERP

UNIT III DESIGN OF PRODUCT, SERVICE AND WORK SYSTEMS Product Design – Influencing factors, Approaches, Legal, Ethical and Environmental issues. Process – Planning, Selection, Strategy, Major Decisions. Service Operations – Types,Strategies, Scheduling (Multiple resources and cyclical scheduling). Work Study – Objectives,Procedure. Method Study and Motion Study. Work Measurement and Productivity – Measuring Productivity and Methods to improve productivity.

UNIT IV

MATERIALS MANAGEMENT Materials Management – Objectives, Planning, Budgeting and Control. Overview of Materials Management Information Systems (MMIS). Purchasing – Objectives, Functions, Policies, Vendor rating and Value Analysis. Stores Management – Nature, Layout, Classification and Coding. Inventory – Objectives, Costs and control techniques. Overview of JIT.

UNIT V

PROJECT AND FACILITY PLANNING Project Management – Scheduling Techniques, PERT, CPM, Crashing CPM networks – Simple Problems. Facility Location – Theories, Steps in Selection, Location Models – Simple Problems. Facility Layout – Principles, Types, Planning tools and techniques.

W.e.f. Academic Session 2013-14

MVCT/MVCP – 302(A) Advanced Dam Design and Construction

1. Gravity Dams :
River valley projects and their purpose, preliminary investigations and surveys, Selection of site for a reservoir; Types of Dams and their choice. Stability factors; Stresses, Elementary profile, low and high Dams, Forces acting on a Dam. Evolution of the profile of a Dam by Method of Zones, Practical profiles. Design of openings in Gravity Dams, contraction joints. Foundation treatment by Grouting.

2. Spillways :
Design of ogee spillway section, Bucket and Energy Dissipation arrangements : Design and Details of siphon, Shaft, side channel, and chute spillways, Miscellaneous types of spillways. Design of spillway crest gates and sluice gates, hoisting Machines.

3. Elementary Design of Arch Dams :
Definition of an Arch Dam, classification of Arch Dams. Principles of Elastic Theory and applied Trial Load Analysis, Inclined arches, Dome-Dams, Details and Methods of analysis.

4. Earth Dams :
Introduction, Design criteria, against over topping, Control of seepage, Theory of flownets for homogoneous and Zoned embankments. Pore pressure, Stability of slopes, Methods of Analysis, slip circle Method, Protection of slopes, Protection against free passageof water, Rockfill dams.

5. Application of Photoelasticity to the Design of Dams. Use of the Electrical Analogy Method in the Design of Dams, stress compuations with embedded Electrical Instruments.
River Diversion for construction of Dams, Constructional aspects in the Execution of River Valley projects.

W.e.f. Academic Session 2013-14

MVCT/MVCP – 302(B) Advanced Foundation Engineering

1. Shallow Foundations :
Bearing Capacity, Terzaghis analysis, Computations of bearing capacity factors. Skempton's analysis. Meyerhof's analysis. Balla's theory. Hansen's theory. Design of Shallow Foundations.

2. Pile Foundation :
Use of piles, Types of piles, Design of Piles, Group action in cohesive and cohesionless soils. Negative skin fricton. Laterally loaded piles. Piles under inclined loads, pile load test, Hrennikoff Method.

3. Engineering with Geosythetics :
Introduction Basic Mechanism of reinforced earth strength characteristics of reinforced soil.

4. Bridge Substructures :
Introduction, elements of bridge substructure, stability analysis of well foundation, design of pie & abutments, sinking of wells.

5. Marine Substructures :
Introduction, Types of Marine structures elements, design criteria, design of gravity wall, piled wharf structure breakwaters.

W.e.f. Academic Session 2013-14

MVCP – 302(C) Project Formulation and Appraisal

UNIT I PROJECT FORMULATION

Generation and Screening of Project Ideas-Project identification-Preliminary Analysis,Market,Technical,Financial,Economic and Ecological-Pre-Feasibility Report and its Clearance,Project Estimates and Techno-Economic Feasibility Report,Detailed Project Report-Different Project Clearances required

UNIT II PROJECT COSTING

Project cash flows-Time value of Money-Cost of Capital

UNIT III PROJECT APPRAISAL

NPV-BCR-IRR-ARR-Urgency-pay back period-Assessment of Various Methods-Indian Practice of Investment Appraiasal-International practice of Appraisal-Analysis of Risk-Different Methods-Selection of a Project and Risk Analysis in Practice

UNIT IV PROJECT FINANCING

Project Financing-Means of Finance-Financial Institutions-Special schemes-Key Financial Indicators

UNIT V PRIVATE SECTOR PARTICIPATION

Private sector participation in Infrastructure Development Proj ects-BOT,BOLT,BOOT-Technology Transfer and Freign Collaboration-Scope of Technology Transfer

W.e.f. Academic Session 2013-14