Effective from Session: 2012							
Course Code	**DCE -601**	**Title of the Course**	**DESIGN OF REINFORCED CONCRETE STRUCTURE – II**	**L**	**T**	**P**	**C**
Year	III	**Semester**	VI	**03**	**01**	**00**	**-**
Pre-Requisite	**DCE -601**	**Co-requisite**					
Course Objectives	To impart in-depth knowledge and critical understanding of the theory and principles of design and design of Reinforced Concrete structures						

Course outcomes	
CO1	Have acquired in-depth knowledge and critical understanding of the theory and principles of design and solution of Reinforced Concrete structures, since they could use new technologies and information systems in the design of Civil Engineering structures with Reinforced concrete
CO2	Be able to perceive, design and analyse Reinforced Concrete structures (Beams, Columns, Frames
CO3	To have the ability to compose, solve and evaluate the internal forces(N,Q,M), the deformations, the stresses and reinforcements in various structures made of Reinforced Concrete

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
1	RCC Slabs	Design of RCC Slabs **(i)** Structural behavior of slabs under uniformly Distributed load (UDL). **(ii)** Types of ends supports. **(iii)** Design of one-way slab. **(iv)** Design of Two-way slab with the help of tables of IS: 456. (Corners not held down)-IS-code method. **(v)** Detailing of reinforcement. **Design of Reinforced Brickwork (i)** Plain brick masonry, permissible stresses. **(ii)** Reinforced Brick work and its use in slabs and lintels. **(iii)** Limitations of the use of R.B. Work. **(iv)**General principles of design of reinforced brick lintels and slabs. **(v)** Design of R.B. beams, slab and lintels	08	CO-1, CO-3
2	Tee Beams	Design of Tee Beams **(i)** Structural behavior of a beam and slab floor laid monolithically. **(ii)** Rules for the design of T-Beams. **(iii)** Economical depth of T-Beams, Strength of T-Beams. **(iv)** Design of singly reinforced Tee-Beams. **(v)** Detailing of reinforcement	08	CO-2
3	Columns & Column Footings	**Designs of Columns & Column Footings: (i)** Concept of long and short columns. **(ii)** IS specifications for main and lateral Reinforcement. **(iii)** Behavior of RCC column under axial load. **(iv)** Design of Axially loaded short and long columns with hinged ends (circular, square and rectangular as per IS specifications). **(v)** Concept of column footing. Design criteria. Design of square isolated column footings. **(vi)** Detailing of reinforcement	08	CO-2
4	Retaining Wall & Water tank	**Cantilever Retaining Wall:** Concept of design and function of different parts of a Cantilever retaining wall and reinforcement details (No numerical shall be asked in the examination) **Water Tank**: Components of Overhead Water Tanks (Dome Shaped), Description of different component e.g. roof, side wall and ring beam, floor slabs, supporting structure and foundations (only reinforcement details be shown and emphasized).	08	CO-3
5	Multi-Storied Framed Structures	**Components of Multi-Storied Framed Structures:** General concept of multistoried framed structures of Columns, beam, slabs, and footing, design criteria and method of placing reinforcement in framed structures. Lifts basements (only diagrams to be taught. No numerical shall be asked in the examination)	08	CO-2, CO-3

References Books:

1. Reinforced cement concrete: AK Jain.
2. Reinforced cement concrete: Sushil Kumar

e-Learning Source:

https://youtu.be/JwiHgkC-6Ic

https://youtu.be/hZKl6zMwiCA

PO-PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1		3		2	3			2				3	3
CO2		3				2		3			1	2	
CO3	2	3								2			2

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Effective from Session: 2012							
Course Code	**DCE-602**	**Title of the Course**	**TRANSPORTATION ENGINEERING-II**	**L**	**T**	**P**	**C**
Year	III	**Semester**	VI	**03**	**01**	**00**	
Pre-Requisite	**DCE-602**	**Co-requisite**	NA				
Course Objectives	• The Aim of this course to know various components and their functions in a railway track. • To expose the students to Railway planning, design, construction and maintenance and planning.						

Course Outcomes	
CO1	Explain the function of various elements of railways.
CO2	Plan and design various elements of railway.
CO3	Apply the various principles traffic control in airport.
CO4	Explain the function of various elements of tunnel and their maintenance.
CO5	focuses on imparting technical knowledge, practical application, and field experience regarding bridge and railway construction and maintenance.

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
Unit-I	**Introduction**	**Permanent Way:** Definition of a permanent way, components of a permanent way, sub grade, ballast, sleepers, rails, fixtures and fastenings. Concept of gauge and different gauges present in India. Suitability of these gauges under different conditions. **(i) RAILS:** Function of rails. Different types of rail sections-double headed, bull headed and flat footed their standard length, weights and comparison. Welded rails-appropriate length of welded rails and advantages of welded rails. **Creep:** Its definition, causes, effects and prevention. Wear of rails, its causes and effects. **(ii) SLEEPERS:** Function of sleepers, Different types of sleepers, wooden, steel, cast iron (pot type), concrete and prestressed concrete, their sizes, shapes, characteristics and spacing. **(iii) BALLAST:** Function, materials used for making ballast stone, brick, slag and cinder, their characteristics. **(iv) FIXTURES AND FASTENINGS:** (a) Connections of rail to rail-Fishplate and fish bolts. (b) Connection of Rail to sleepers, Sketches of connection between flat footed rails with various types of sleepers with details of fixtures and fasteners used.	8	CO-1
Unit-II	**Geometrics for Broad Gauge and Points and Crossings**	Typical Cross-sections of single and double broad gauge railway tracks in cutting and embankment. Permanent and temporary land width. Gradients ruling, maximum, minimum for drainage. Gradients in station yards. Curves, Limiting radius of a curve for broad gauge. Transition length to be provided for railway curves as per railway code. Super-elevation-its necessity and limiting value. Definition of equilibrium can't and cant deficiency, Widening of gauge on curves. **Points and Crossings:** Necessity and details of arrangement, sketch of a turnout definition of stock rail, tongue rail, check rail, lead rail, wing rail, point rail, splice rail, stretcher bar, throw of switch, heel of switch, nose of crossing, angle of crossing, overall length of turnout, facing and trailing points, diamond crossing, cross over, triangle.	8	CO-2
Unit-III	**Track Laying and Maintenance of Track**	Preparation of subgrade. Collection of materials setting up of material depot and carrying out initial operations such as edging of sleepers, bending of rails and assembling of crossings. Definitions of base and rail head. Transportation by material trollies, rail carriers and material trains. Method of track laying (parallel, telescopic and American methods). Organization of layout at rail head. Ballasting of the track. **Maintenance of Track: (i)** Routine maintenance of formation and side slopes, rails, fixtures and drainage. **(ii)** Special maintenance - Replacement of defective sleepers and rails. **(iii)** Tools used for the above operations.	8	CO-3
Unit-IV	**Bridges**	**Introduction and Classification:** Bridge: Its function and component parts, different parts, difference between a bridge and a culvert. **CLASSIFICATION OF BRIDGES:** Their structural elements and suitability: **(i) According to life:** Permanent and temporary. **(ii) According to roadway level:** Deck, through and semi-through. **(iii) According to material:** Wooden, steel, RCC, prestressed and masonry. **(iv) According to structural form:** (a) Beam type - RCC, T-Beam, steel girder bridges, plate girder and box girder, trussed bridges N and warren girder bridges. (b) Arch type-open spandril and filled spandril, barrel and rib type. (c) Suspension Type-Unstiffened sling type, its description with sketches. (d) According to the position of highest flood level: submersible and non-submersible. **Site selection and collection of data:** Factors affecting the selection of site for a bridge data to be collected. Bridge span. Economical span and factors affecting it.	8	CO-4
Unit-V	**Piers, Abutments and Wing Walls**	**Piers:** Definition parts. Types: solid (masonry and RCC); Open cylindrical and abutment piers. Definition of the following terms: height of pier, water way (natural and artificial), afflux and clearance. Abutments and wing walls: Definition, types of abutments (straight and tee) abutment with wing walls (straight, splayed, return and curved). **Bridge Bearings and Temporary Bridges and Maintenance:** Purpose of bearings: Types of bearings: Fixed plate, sliding plate, deep cast base, rocker and roller bearings, their functions with sketches. **Temporary Bridges:** Necessity, description with sketches of pontoon and boat	8	CO-5

		bridges. **Maintenance of Bridges:** Inspection of bridges, routine maintenance.in the base course: Methods of construction as per Ministry of Shipping and transport (Government of India). **(v)** in the surfacing: Methods of constructions as per Ministry of Surface and Transport, Government of India, specifications and quality control; equipment used . **Maintenance of Track:** NOTE: The study of the subject must be supplemented by a visit to a nearby railway station.		

References Books:

1. Railway Engineering: Satish Chandra, M.M. Agarwal

e-Learning Source:

1. https://www.youtube.com/watch?v=ONlgYeiw1U4

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	2	3					2				
CO2	3	2	2	3					2				2
CO3	2	3	2	1					1			1	
CO4	3	2	2	2					2				3
CO5													

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Effective from Session: 2012							
Course Code	DCE-603	**Title of the Course**	ESTIMATING COSTING & VALUATION	**L**	**T**	**P**	**C**
Year	III	**Semester**	VI	**03**	**01**	**00**	
Pre-Requisite	BCM	**Co-requisite**	CONCRETE TECHNOLOGY				
Course Objectives	This subject covers the various aspects of estimating of quantities of items of works involved in buildings, water supply and sanitary works, road works and irrigation works. This also covers the rate analysis, valuation of properties and preparation of reports for estimation of various items						

Course Outcomes	
CO1	To know the basic measurements method, rate analysis, quantity of items and valuation of properties.
CO2	Impart the knowledge of Estimating, Costing and Valuation for Civil Engineering Structures.
CO3	Understand how to prepare a detailed estimate for a residential building and calculate the quantities for various items of work.
CO4	Analyze the rates for various items of work and to prepare a abstract estimate
CO5	Identify the preparation of bar bending schedule for reinforcement works.

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
Unit-I	**Introduction to Estimating**	Types of estimates, drawings (to be attached with these estimates. Preparation of rough cost estimates). Units of measurement and units of payment of different items of work. Different methods of taking out quantities: Centre line in-to-in/out-to-put methods. (a) Preparation of a detailed estimate, complete with detailed reports, specifications, abstract of cost and material statement for a small residential building with a flat roof. (b) Preparation of a detailed estimate with specification, abstract of cost and material statement for pitched roof with steel truss only.	10	CO-1
Unit-II	**Specifications & Analysis of Rates**	Need, general and detailed specifications, method of writing specifications, Analysis of rates: (i) Steps in the analysis of rates for any item of work, requirement of material, labour, sundries T.& P. contractor's profit. (ii) Calculation of quantities of materials for: (a) Plain cement concrete of different proportions. (b) Brick masonry in cement and lime mortar. (c) Plastering and pointing with cement mortar in different proportions. (d) Whitewashing. **Analysis of Rates:** Analysis of rates of the following item of work when the data regarding labour, rates of material and rates of labour is given. (a) Earth work in excavation and filling with a concept of lead and lift. (b) Cement concrete in foundation. (c) R.C.C. and R.B. in roof slabs. (d) First class burnt brick masonry in cement mortar. (e) Cement plaster. (f) **Cement pointing:** Flush, deep pointing. Tender and preparation of tender document.	10	CO-2
Unit-III	**Irrigation**	Preparation of detailed estimate for a brick lined distributary from a given section. **Public health:** Preparation of detailed estimate for laying a water supply line (C.I. Pipe). Preparation of detailed estimate for sanitary and water supply fittings in a domestic building containing one Set of toilets and septic tank.	6	CO-3
Unit-IV	**Roads**	Methods for calculating earth work using: (i) Average depth. (ii) Average cross-sectional area. (iii) Graphical method. Calculations of quantities of materials for roads in plains from given drawings. Preparation of detailed estimate using the above quantities. Detailed estimate of a single span slab culvert with return wing walls. Calculation of quantities of different items of work for a masonry retaining wall from given drawings.	8	CO-4
Unit-V	**Valuation**	Purpose of valuation, principles of valuation. Definitions of term such as depreciation, sinking fund, salvages and scrap value. Valuation of a building property by replacement cost method and rental return method. Method of calculation of standard rent-Concept of capitalized value and years purchase.	6	CO-5

References Books:

1. Estimating and Costing by B. N. Dutta,
2. Estimating and Costing by B.C..Punmia

e-Learning Source:

https://onlinecourses.swayam2.ac.in/nou20_cs11/preview

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	2	3	2				3	3	1	2	2	2	
CO2	2	3	3					2	2	1	1	1	
CO3	2	3	3					2	1	2	1		2
CO4	2	3	2	1	1	2			3			2	
CO5	2	3	2						2		1		2

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Effective from Session: 2012							
Course Code	**DCE-604**	**Title of the Course**	**DESIGN OF STEEL AND MASONRY STRUCTURES**	**L**	**T**	**P**	**C**
Year	III	**Semester**	VI	**03**	**01**	**00**	
Pre-Requisite	DCE-301	**Co-requisite**	NA				
Course Objectives	This course is aimed at providing basic knowledge in the areas of limit state method & working stress method and the concept of design of structural steel elements and masonry structure.						

Course Outcomes	
CO1	Understand the analysis of forces acting on different members and select proper material and sections from steel table.
CO2	Understand the design of tension members, compression members, beams, purlin, column bases and steel roof trusses and understand design values for members using IS800-2007.
CO3	Understand and interpret the fabrication drawings and structural drawings.
CO4	Understand the drawing of designed sections of steel roof truss and its connections.
CO5	Understand the use IS800-1987 part I to IV, provisions for dead load, live loads and wind loads and seismic loads.

UnitNo.	**Title of the Unit**		**Contact Hrs.**	**Mapped CO**
Unit-I	**Structural Steel and connections**	**(i)** Properties of structural steel as per IS: 226 and IS: 1977. **(ii)** Designation of structural steel sections as per IS Handbook and IS: 800. **Structural Steel Connections- (i)** Riveted connections - types of rivets, permissible stresses in rivets. Types of riveted joints, Failure of riveted joints, Assumptions made in the design of riveted joints. Specification for riveted joints. Design of riveted joints for axially loaded members. **(ii) Welded Connections:** Comparison between riveted and welded joints, types of welds, permissible stresses in welds, types of welded connections, strength of welded joint, Design of welded joints for axially loaded members.	10	CO-1
Unit-II	**Tension Members & Compression Members**	**(A) Tension Members** Forms of common sections. Permissible Stresses in tension for steel. Strength of a tension member. Design of tension members (flats, angles & Tee Sections only). Tension splice and their design. **(B) Compression Members:** Design of struts and columns as per IS:800. Effective length, slenderness ratio and permissible stresses, simple and built-up sections, concept of lacings in built up columns.	10	CO-2
Unit-III	**Beams**	Design criteria, allowable stresses, Design of laterally restrained beams including simple built-up sections. Checks for web bulking, web crippling and deflection.	6	CO-3
Unit-IV	**Column Bases and Steel Roof Trusses**	**(A) Column Bases** Column bases, design of simple column base. **(B) Steel Roof Trusses:** Different types of trusses, Loads on roof trusses. Various combinations of loads to cause worst condition. Design of angle and tubular trusses (Tension and compression members), Design of purlin.	8	CO-4
Unit-V	**Masonry and Foundation Structures**	**Masonry and Foundation Structures** Gravity masonry dams, retaining walls and chimneys subjected to lateral pressures. Design of masonry wall foundation (stepped footing).	6	CO-5

References Books:

1. DESIGN OF STEEL STRUCTURES – S.K DUGGAL
2. Design of Steel Structures– N. Subramanian

e-Learning Source:

1. **https://onlinecourses.nptel.ac.in/noc24_ce113/**

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	2	3									1		2
CO2	2	3						2				1	
CO3	2	3						2			2		
CO4	2	3		1	1	2							2
CO5	2	3									1	2	

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Effective from Session: 2012							
Course Code	**DCE-605**	**Title of the Course**	**EARTHQUAKE ENGINEERING**	**L**	**T**	**P**	**C**
Year	III	**Semester**	VI	**03**	**01**	**00**	
Pre-Requisite	**DCE-501**	**Co-requisite**	**NA**				
Course Objectives	1.Learning how to analyse the seismic response of different types of buildings. 2.Learning how to design, construct, and maintain structures to perform as expected during earthquakes and in compliance with building codes.						

Course Outcomes	
CO1	Basics knowledge of dynamics & method of dynamics analysis.
CO2	Blast & fire-resistant design of structure.
CO3	Acquire knowledge of structural dynamics & earthquake engineering & be able to discriminate, evaluate, analyze & integrate existing & new knowledge.
CO4	Retrofitting, rehabilitation & strengthening of structure.
CO5	developing an in-depth understanding of disaster management policies, legal frameworks, emergency response mechanisms, and vulnerability reduction strategies

UnitNo.	**Title of the Unit**		**Contact Hrs.**	**Mapped CO**
Unit-I	**Introduction**	Causes of earthquakes and seismic waves, magnitude, intensity and energy release, Basic terminology, Characteristics of earthquakes, Seismic hazard, vulnerability and risk, Seismic Zoning.[2] Earthquakes performance of structures in past earthquakes.	8	CO-1
Unit-II	**Philosophy**	Philosophy of earthquake resistant design and concept of ductility, short and long period structures, Concept of spectrum, Static force calculations.	8	CO-2
Unit-III	**Architectural considerations**	Building simplicity, symmetry. Irregularities, Continuity and Uniformity. Effect of soils and liquefaction, Remedial measures, Construction of earth structures. Seismic construction of masonry buildings, precisions of IS: 4326.	8	CO-3
Unit-IV	**Seismic construction of RC buildings**	Seismic construction of RC buildings detailing, provisions of IS: 13920. Retrofitting of masonry and reinforced concrete buildings. **Disaster Management:** Definition of disaster - Natural and Manmade, Type of disaster management, how disaster forms, Destructive power, Causes and Hazards, Case study of Tsunami Disaster, National policy- Its objective and main features.	8	CO-4
Unit-V	**Disaster Management**	National Environment Policy, need for central intervention, State Disaster Authority- Duties and powers, Case studies of various Disaster in the country, Meaning and benefit of vulnerability reduction, Factor promoting vulnerability reduction and mitigation, Emergency support function plan. Main features and function of National Disaster Management Framework, Disaster mitigation and prevention, Legal Policy Framework, Early warning system, Human Resource Development and Function, Information dissemination and communication.	8	CO-5

References Books:

1. Earthquake Engineering: S.K. Jain
2. Disaster Management: Ayaz Ahmad

e-Learning Source:

1. https://www.youtube.com/watch?v=RWck4EnfdSE&list=PLyqSpQzTE6M-81uKP3sjj0lZX_nnrOwpV

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	2	3			1				3				1
CO2	1				2						3		2
CO3	2							1		3	3	1	
CO4	2			2		2					1	2	
CO5													1

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Effective from Session: 2012							
Course Code	DCE-606	**Title of the Course**	CONSTRUCTION MANAGEMENT & ACCOUNTS- II	**L**	**T**	**P**	**C**
Year	III	**Semester**	VI	**3**	**1**	**0**	**-**
Pre-Requisite	DCE-606	**Co-requisite**	NA				
Course Objectives	To develop the knowledge of construction management techniques for project Management.						

Course Outcomes	
CO1	To be able to gain the knowledge of construction administration issues and quality related problems in construction projects.
CO2	To be able to have an idea of hierarchy, work responsibility and work progress.
CO3	To be able to understand risks and uncertainty related issues in constructions.
CO4	To be able to understand the concept of entrepreneurship development in civil engineering field.
CO5	To be able to understand the responsibilities of engineer in civil engineering projects

UnitNo.	Title of the Unit		Contact Hrs.	Mapped CO
UNIT - I	**Stock and Tools & Plant**	(a) Kind of articles in stock, (b) Sources of stock receipt, Suppliers. Other departments, divisions and sub divisions. Manufacturers, Works (c) Sub heads of stock. (d) Quantity accounts of stock. Rules for preparing indent and invoices, preparation of indent in proper form. Register of stock receipts and issues, procedure for recording entries in proper form. Actual filling of the form. (e) Return of monthly transaction of stock and half yearly return of stock. (f) Stock taking of stores-general rules. (g) Surpluses and shortages of stock action for rectification of mistakes in stock accounts. (h) Losses of stock-reporting the loss, estimates for loss of stock and writing off. **Tools and Plants (T&P):** (a) Meaning. (b) Classification of T&P - Register of T&P receipts and Issues-Rules for actual filling of the prescribed form. - Statement of receipts and issues of T&P in prescribed form. (c) Sources of recipe of T&P (d) Authority of issue of T&P. (e) Surpluses and shortage of T&P-reconciliation of accounts. (f) Points of difference in accounts of stock and T&P. (g) Disposal of unserviceable articles of T&P. Preparation of survey report in prescribed form.	8	CO-1
UNIT - II	**Works**	**(i)** Categories: (a) Original works. (b) Repair works. **(ii)** Classification of works according to cost: (a) Major works. (b) Minor works. (c) Petty works. **(iii)** Conditions to be fulfilled before a work can be taken in hand: (a) Administrative approval. (b) Technical sanction. (c) Appropriation of funds. (d) Expenditure sanction (for plan works) **(iv)** Methods of carrying out works: (a) Departmentally through daily labour (b) Through contractors - Piece work system - work order - Contract system - Agreement. **(v)** Different types of contract: (a) Item rate contract. - Labour rate (%age above or below) for various items or for covered areas construction (Private construction only) - Through rate basis (%age above or below) (b) Lump-sum contract. **(vi)** Allotment of works: (a) Concept of quotations and tenders (b) Work order - Rules and Form. **(vii)** Definition of deposit works and Taccavi works.	9	CO-2
UNIT - III	**Payment for Works**	**(i)Daily labour:** (a) Meaning. (b) Muster roll. Rules. Instruction for maintenance. Three parts of M.R. - Nominal roll, unpaid wages, detail of work done and filling of prescribed form. (c) Daily labour report, filling of prescribed form. (d) Casual labour-Rolls its difference from M.R. (e) Mistakes of common occurrence. **(ii)** Payment of work charged establishment preparation of pay bill on prescribed form. **(iii)Payment to contractors and suppliers:** (a) Record of measurement. Measurement book (M.B.) General Instructions. Method of payment after measurements are recorded in M.B. Common mistakes in the use and maintenance of M.B. Student may be directed to record the measurement of different item such as W/w, Distemper, Painting, Glass fitting, Plastering, etc. for maintenance of a building. (b) Check measurement Book (C.M.B.) Purpose, administration with regard to its maintenance. (c) Standard measurement book (SMB) Purpose and instruction with regard to its maintenance. **Different types of payment:** (a) First and final payment. (b) Running payment. Secured advance. On account payment, Advance payment, Running and final payment. Hand receipt. Clause in which the detailed measurements are dispensed.	9	CO-3
UNIT -IV	**Miscellaneous and Entrepreneurship Development**	**(i)** Duties of Junior Engineer / S.O. and S.D.O. **(ii)** Instructions on transfer of charge. **(iii)** Maintenance of log books of vehicles and machinery. **(iv)** Manufacturers accounts and out turn of machinery. **(v)** Dealing with railways-booking of consignment, taking delivery, credit note, demurrage and wharf age charges and damaged consignment. **Entrepreneurship Introduction:** Entrepreneur, entrepreneurship, its meaning & importance. Qualities of an entrepreneur. Entrepreneur Motivation Training.	7	CO-4
UNIT -V	**Financing Agencies**	Financial agencies for land, infra-structure, machinery, raw material, import of raw material and machinery. Role and function of Govt. department connected with the development of industries/business ventures in the State. **Industrial Legislation and taxes:** Industrial and labour laws, production tax, local tax, trade tax, excise duty and income tax. **Project Report:** Component of project report - Land, building, electricity, water, equipment and other utilities. Materials, its availability, cost, labour availability and wage rates. Project	7	CO-5

		report preparation, provisional registration and plan of acquiring finance from proper source (financing agencies). **Intellectual Property Rights:** Introduction to IPR (Patents, Copy Right, Trade Mark), Protection of undisclosed information, Concept and history of patents, Indian and International Patents Acts and Rules, Patentable and Non patentable invention including product versus Process.		

References Books:

1. **Construction Management and Accounts by V. N. Vazirani**

e-Learning Source:

1. **https://youtu.be/QPwCBKaluO4?si=4Ur0JEnUwqdo2L7z**

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	-	-	3	-	-	-	2	1	-	3	-	3	-	-
CO2	-	-	1	-	-	-	2	2	-	1	-	2	-	-
CO3	-	-	3	-	-	-	3	3	-	1	-	-	3	-
CO4	-	-	3	-	-	-	2	3	-	2	-	-	1	-
CO5	-	-	2	-	-	-	1	2	-	3	-	-	2	3

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Effective from Session: 2012							
Course Code	DCE-651	**Title of the Course**	Reinforced Cement Concrete & Highway Lab	**L**	**T**	**P**	**C**
Year	III	**Semester**	VI	**0**	**0**	**2**	
Pre-Requisite	DCE-651	**Co-requisite**	NA				
Course Objectives	The objective of an RCC lab course is to provide hands-on experience and practical knowledge in designing, analyzing, and constructing reinforced cement concrete (RCC) structures.						

Course Outcomes	
CO1	Assess the quality of the concrete through laboratory tests.
CO2	Design the mix proportion for the required concrete strength
CO3	Assess the quality of bitumen through laboratory tests.
CO4	Assess the properties of sub grade soil through laboratory tests.

Unit No.	**Title of the Unit**		**Contact Hrs.**	**Mapped CO**
1	Experiment No.1	Determination of resistance to abrasion of aggregates by Los Angel's Abrasion Testing Machine.	2	CO1
2	Experiment No.2	Determination of Aggregate impact value by aggregate impact tester.	2	CO1
3	Experiment No.3	Determination of C.B.R. Value of sub grade soil.	2	CO1
4	Experiment No.4	Determination of Aggregate crushing value by aggregate crushing test apparatus.	2	CO2
5	Experiment No.5	Determination of Penetration Value of bitumen.	2	CO2
6	Experiment No.6	Determination of softening point of bitumen.	2	CO3
7	Experiment No.7	Determination of flash and fire point of bitumen.	2	CO3
8	Experiment No.8	Determination of Compressive Strength of Cement by Cube test.	2	CO3
9	Experiment No.9	Determine the workability of fresh mix (M-15) by slump test.	2	CO4
10	Experiment No.10	Determine Initial and Final setting time of Cement.	2	CO4
11	Experiment No.11	Determine Normal Consistency of Cement	2	CO2

References Books:

1. Lab Manual

e-Learning Source:

1. https://youtu.be/RiWOyRhRCck?si=BOLF93n1FZvyaEXm

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	1	3	2	3	1				2	2				
CO2	1	3	1	3	1	2			2	2		1		2
CO3	1	3	2	3	1				2	2			2	
CO4	1	3	2	3	1				2	2		2		3

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**