Effective from Session: 2017							
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	PSO1	PSO2
CO1		3		2	3			2			3	3
CO2		3				2		3			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: 2017							
Course Code	DCMS-602	**Title of the Course**	FIELD PRACTICES IN CONSTRUCTION	**L**	**T**	**P**	**C**
Year	III	**Semester**	VI	**3**	**1**	**0**	
Pre-Requisite	DCMS-602	**Co-requisite**	NA				
Course Objectives	The course aims to provide a comprehensive understanding of construction practices, including layout planning, field testing of materials, structural drawings, formwork, reinforcement detailing, concrete curing, and estimation techniques, while familiarizing students with site engineering responsibilities and essential construction equipment.						

Course Outcomes	
CO1	Understanding of organizational and technological aspects of building construction and infrastructure engineering structure construction.
CO2	Ability to design organization and technology of construction work performance during construction preparation stage.
CO3	Ability to identify and resolve organizational and technological problems during the construction process.
CO4	Ability to organize the construction site and operate the construction of infrastructure engineering and building construction structure.

UnitNo.	**Title of the Unit**		**Contact Hrs.**	**Mapped CO**
UNIT-I	**INTRODUCTION**	Introduction to layouts, Field layout of frame building and load bearing structure, Types of drawings; Key plan, Structural drawing, Foundation layout drawings, plumbing & Electrical drawing, duties of site Engineer.	10	CO-1
UNIT-II	**TESTS ON MATERIALS**	Field test of Brick, Steel Bar, Coarse Aggregate, Coarse & fine Sand, Cement and Concrete and Rebound Hammer Test.	9	CO-2
UNIT-III	**FORM WORK**	Form Work- Types of formworks, Materials used, time required for Stripping of formwork, IS Codes Recommendation, Centering &leveling of formwork, Shuttering oil & its Uses, Nails, Binding wire & its gauges, Bearing Plaster.	6	CO-3
UNIT-IV	**INDIAN STANDARD CODE**	Lapping of steel-in column & slab, Space/Cover Block, Nominal Cover- as per IS Code, pH value of Water, Curing of Concrete, Method of curing of concrete, Time Requirement for Concrete.	7	CO-4
UNIT-V	**BAR BENDING SCHEDULE**	Introduction to BBS, properties of BBS for footing, column, slab. Estimation of Quantities of RCC, Excavation, shuttering etc., Rate analysis, Equipment's used in Construction Industry-1 ft., Mixer, Shovel, Plumb bob, spirit level.	8	CO-4

References Books:

1. Engineering materials: R.K. Rajput
2. Indian standard Codes.

e-Learning Source:

1. https://www.youtube.com/watch?v=zJKXGEyAteg&list=PL-7LdSlcTiKLwBDYN2eBMCve74Wdgubt1

PO-PSO CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO1		1			2				3	1	2			
CO2	1	2	2			2	2	1	2	2		2		2
CO3		1	3	2	1		3	2	1	2			3	2
CO4			2	1	3	2	1			2		1		2

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

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

Effective from Session: 2017							
Course Code	DCE-603	**Title of the Course**	ESTIMATING COSTING & VALUATION	**L**	**T**	**P**	**C**
Year	III	**Semester**	VI	**03**	**01**	**00**	
Pre-Requisite	DCE-603	**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: 2017							
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-604**	**Co-requisite**	DESING OF RCC				
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: 2017							
Course Code	DCMS-605	**Title of the Course**	QUALITY AND SAFETY MANAGEMENT IN CONSTRUCTION	**L**	**T**	**P**	**C**
Year	III	**Semester**	VI	**3**	**1**	**0**	
Pre-Requisite	DCMS-605	**Co-requisite**	NA				
Course Objectives	The course aims to provide an understanding of quality management principles and practices, including quality assurance, total quality management (TQM), and adherence to standards in construction, while emphasizing safety programs, hazard prevention, and site management to ensure safety and health in the construction industry.						

Course Outcomes	
CO1	Evaluate workplace to determine the existence of occupational Quality & Safety hazards.
CO2	Identify relevant regulatory and national consensus standards along with best practices that are applicable.
CO3	Select appropriate control methodologies based on the hierarchy of controls.
CO4	Analyze injury and CO data for trends.

UnitNo.	**Title of the Unit**		**Contact Hrs.**	**Mapped CO**
UNIT-I	**INTRODUCTION**	Introduction to quality; Importance of quality; Quality transition- quality control and inspection, quality assurance, total quality management; Evolution of quality management.	8	CO-1
UNIT-II	**PLANNING AND CONTROL OF QUALITY**	Planning and control of quality during design of structures; Tools and techniques for quality management; Inspection of material sand machinery.	8	CO-1,2
UNIT-III	**QUALITY ASSURANCE**	Construction Law-Public law; Government Departments and Local Authorities; Private Law, Contracts, property law and building law.	8	CO-2
UNIT-IV	**TOTAL QUALITY MANAGEMENT**	Total quality management (TQM)-principles, tools and techniques. Introduction to safety; Safety and Health programs in construction industry; Planning for safety provisions.	8	CO-3,4
UNIT-V	**CONSTRUCTION HAZARD SAND SAFETY GUIDELINES**	Construction hazard sand safety guidelines; Prevention techniques for construction accidents; Site management regarding safety recommendations; Training for safety awareness and implementation; Construction safety and health manual.	8	CO-4

References Books:

1. Planning, analysis, selection, financing, implementation, a review: P. Chandra
2. Financing-Asset-based financial engineering, :J. D. Finnerty

e-Learning Source:

1. https://www.youtube.com/watch?v=cu3OmvOwZ94&pp=ygVBbGVjdHVyZSBub3RlIFFVQUxJVFkgQU5EIFNBRkVUWSBNQU5BR0VNRU5UIElOIENPTlNUUlVDVElPTiBuaXR0dHI%3D

PO-PSO CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PO 13	PSO 1	PSO 2	PSO 3
CO1		1	3	1	3		1	1	3	2	3	3	2			
CO2		1	3	1	3		1	1	3	2	2	2	2	1		2
CO3		1	3	1	3		2	1	3	2	3	3	2		2	
CO4		1	2	1	3		1	1	2	2	2	3	2	2		3

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

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

Effective from Session: 2017							
Course Code	DCMS-606	**Title of the Course**	CONTRACT MANAGEMENT	**L**	**T**	**P**	**C**
Year	III	**Semester**	VI	**3**	**1**	**0**	
Pre-Requisite	DCMS-606	**Co-requisite**	NA				
Course Objectives	The course objective is to equip students with a comprehensive understanding of contract management, covering the formation, administration, and closure of contracts, along with managing risks, changes, and performance. It also explores construction law, contract procurement, legal aspects, and dispute resolution in various contract situations.						

Course Outcomes	
CO1	Understand basic contract law.
CO2	Understand contract management terminology
CO3	Plan and organize contracts for goods and services
CO4	Define the scope of work, process, agreement and management philosophy.
CO5	Direct and control the contract administration.
CO6	Negotiate contracts and terms.
CO7	Evaluate, negotiate and enforce service level agreements, and renegotiate and/or terminate contracts.

UnitNo.	**Title of the Unit**		**Contact Hrs.**	**Mapped CO**
UNIT-I	**INTRODUCTION**	Contract management – Introduction, Overview of contract management, overview of activities in contract management. Planning & People – Resource management. Contract formation – Formation of contract, contract startup, managing relationship.	8	CO-2,3
UNIT-II	**CONTRACT MANAGEMENT**	Contract Administration & Payments – Contract administration, Payments. Managing Risk and Change – Managing risk & managing change. Contract Closure & Review – Ending a contract, Post implementation review.	8	CO-5
UNIT-III	**CONSTRUCTION LAWS**	Construction Law-Public law; Government Departments and Local Authorities; Private Law, Contracts, property law and building law.	8	CO-1,4
UNIT-IV	**CONSTRUCTION CONTRACTS**	Construction Contracts - Contract Specifications, types of contract documents used for construction. Contract Procurement-Selecting contractor. Contract Management in various situations – Contract management in NCB works, contract management in ICB works contract, contract management in consultancy.	8	CO-6
UNIT-V	**LEGAL REQUIREMENTS**	Legal aspect in contract management – Contract management in legal view, dispute resolution, integrity in contract management Managing performance – Introduction, monitoring & measurement.	8	CO-7

References Books:

1. Planning, analysis, selection, financing, implementation, and review: P. Chandra.
2. Construction Contracts: Jimmie Hinze
3. Contracts and the Legal Environment for Engineers and Architects: Joseph T. Bockrath

e-Learning Source:

1. https://www.youtube.com/watch?v=MYOMJiRJbiw&pp=ygUqbGVjdHVyZSBub3RlIG9uIGNvbnRyYWN0IG1hbmFnZW1lbnQgbml0dHRy

PO-PSO CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PO 13	PSO 1	PSO 2	PSO 3
CO1		1	2	1	3	1	2	1	2	3	1	1	3			
CO2		1	2	1	3	2	2		2	3	1	1	3	1		2
CO3		1	2	1	3	3	2		1	3	1	2	3		2	
CO4		2	2	1	3	2	3		2	3	1	3	3			3
CO5		1	2	1	2	1	2		2	3	1	1	3		2	
CO6		1	2	1	2	1	1		1	3	1	1	3	1		
CO7		1	2	1	3	3	3		1	3	1	1	3			

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

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

Effective from Session: 2017							
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**