

Course No.	CEL301			
Course Title	FOUNDATION ENGINEERING			
Course Coordinator	D J Katyayan			
Slot in which offered. If not offered write N	Odd		Even	
	N		Y	
Structure	Lecture	Tutorial	Practical	Credits
	3	1	0	8
Prerequisite Course Codes As per proposed Course Numbers	Soil Mechanics			
Prerequisite credits				
Equivalent Course Codes. As per proposed courses and old courses				
Overlap course codes As per proposed Course Numbers	-	-	-	-
Text Book (Max. 2)	Title	Soil Mechanics in Theory & Practice		
	Author	Alam Singh		
	Publisher	Asia Publishing House		
	Edition	1975 & later		
	Title	Geotechnical Engineering		
	Author	S. K. Gulhati & Manoj Dutta		
	Publisher	Tata McGraw-Hill		
	Edition	2005		
Reference Books	Title	Geotechnical Engineering		
	Author	Purushothama Raj		
	Publisher	Tata McGraw Hill Publishing Co. Ltd.		
	Edition	1995		
	Title	Soil Mechanics & Foundation Engg		
	Author	Punmia B.C.		
	Publisher	Laxmi Publication Pvt. Ltd, New Delhi,		
	Edition	1994		
	Title	Geotechnical Engineering		
	Author	C. Venkatramaiah		
	Publisher	New Age International Ltd.		
	Edition	(Second Edition) 1995		
	Title	Basic & Applied Soil Mechanics		
	Author	Gopal Ranjan & A.S. RAO,;		
Publisher	New Age InternationalLtd,			
Edition	2004.			
	Title	Soil Mechanics & Foundation Engg.		
	Author	Arora K.R.		
	Publisher	Standard Publishers Distributors, Delhi,		

	Edition	1989 & later
Content		<p>1. Shear Strength: General principle of tests, concept of failure strength, Drainage condition, pore pressure and its measurement, pore pressure parameters, Modified failure envelope. Liquefaction and effect of soil shaking. Shear Strength of Cohesionless & cohesive soils.</p> <p>2. Stability of Slopes: Causes and types of slope failure, stability analysis of infinite slopes and finite slopes, centre of critical slip circle, slices method for homogeneous $c-\phi$ soil, slopes with pore pressure consideration. Taylor's stability numbers & stability charts, methods of improving stability of slopes.</p> <p>3. Lateral Earth Pressure: Earth pressure at rest, active & passive pressure, General & local states of plastic equilibrium in soil. Rankine's and Coulomb's theories for earth pressure. Effects of surcharge, submergence. Rebhann's criteria for active earth pressure. Graphical construction by Poncelet and Culman for simple cases of wall-soil system for active pressure condition.</p> <p>4. Ground Improvement: Methods of soil stabilization use of admixtures (lime, cement, fly-ash) in stabilization. Basic concepts of reinforced earth, use of geo-synthetic materials, Salient features, function and applications of various geo-synthetic materials.</p> <p>5. Bearing capacity of soils: Terzaghi's theory, its validity and limitations, bearing capacity factors, types of shear failure in foundation soil, effect of water table on bearing capacity, correction factors for shape and depth of footings. Bearing capacity estimation from N-value, factors affecting bearing capacity, presumptive bearing capacity.</p> <p>Settlement of shallow foundation: causes of settlement, elastic and consolidation settlement, differential settlement, control of excessive settlement. Proportioning of footings for equal settlement. Plate load test: Procedure, interpretation for bearing capacity and settlement prediction.</p> <p>6. Pile Foundation: Classification of piles, constructional features of cast-in-situ & pre cast concrete piles. Pile driving methods, effect of the driving on ground. Load transfer mechanism of axially loaded piles. Pile capacity by static formula and dynamic formulae, pile load test and interpretation of data, group action in piles, spacing of piles in groups, group efficiency, overlapping of stresses. Settlement of pile group by simple approach, negative skin friction and its effect on pile capacity, general feature of under reamed piles.</p> <p>7. Geotechnical Exploration: Importance and objectives</p>

	of field exploration, principal methods of subsurface exploration, open pits & shafts, types of boring, number, location and depth of boring for different structures, type of soil samples and samplers. Principles of design of samplers, boring and sampling record. Standard penetration test, corrections to N-values & correlation for obtaining design soil parameters.
Course No.	

Course No.	CEL402	Open course (Y/N)	HM Course (Y/N)	Discontinued (Y/N)	
Course Title	ESTIMATING, COSTING & CONTRACTS				
Course Coordinator	Prof S. R. Dongre				
Slot in which offered. If not offered write N	Odd		Even		
	E				
Structure	Lecture	Tutorial	Practical	Credits	
	3	0	2	8	
Prerequisite Course Codes As per proposed Course Numbers	Building Drawing				
Prerequisite credits					
Equivalent Course Codes. As per proposed courses and old courses	CEL367 ESTIMATING, COSTING & CONTRACTS				
Overlap course codes As per proposed Course Numbers	CEL367 ESTIMATING, COSTING & CONTRACTS				
Text Book (Max. 2)	Title	Estimating ,Costing & Contracts			
	Author	Rangawala S.C.,			
	Publisher	Chortor Publications			
	Edition	2004			
	Title	Estimating and Costing in Civil Engineering			
	Author	Dutta B.N.			
	Publisher	UBS Publication			
	Edition	2004			
Reference Books	Title	Estimating & Costing			
	Author	M.Charborty,			
	Publisher	Authors Publication Kolkatta			
	Edition	1998			
	Title	Red Book of PWD			
	Author				
	Publisher				
	Edition				
	Title				
	Author				
	Publisher				
	Edition				
	Title				
	Author				

	Publisher	
	Edition	
	Title	
	Author	
	Publisher	
	Edition	
Content	<ol style="list-style-type: none"> 1. Estimate and Estimating: Purposes of Estimating, Types of Estimates, Methods of Building Estimates, Units of Measurement of Various Items. Methods of Detailed Estimates, Detailed Estimation of civil Engineering Works: Building (Load Bearing and RCC Framed Structures), Culverts, Hydraulic Structures and Water Supply and Sanitary Works and Road Works. 2. Specifications: Definition, Objectives, Use, Types, Classification, Design of Specifications, Principles of Specification Writing, Sources of Information and Typical Specifications. 3. Contracts: Definition, Essential Requirements, Trade usages, Forms of contract, Termination of Contracts, Labour Contract Negotiated Contracts, Schedule of Prices Contracts, Package Deal Contracts, Demolition Contracts, Responsibilities of the Engineer, Contractor and Owner, Earnest Money and Security Deposits, Mobilization Fund, Tender, Opening of Tenders, Scrutiny of Tenders, Acceptance of Tender, Revocation of Tender, Tender form, Unbalance Tender, Liquidated Damages, Advertisement, contract Documents, Qualification of Contractors, Direct and Indirect Costs, Basic price Contracts. Conditions of Contract: Definition, Object, Importance, Peculiarities, General Provisions, Typical Clauses of the Conditions of Contract, Conditions of Contract in Outlines. 4. Rate Analysis: Purposes of Rate Analysis, Factors affecting, importance, Schedule of Rates, Task works per Day, Rate analysis of typical Items. 5. Valuation: Purposes, Cost, Price and Value, Forms of Value, Classification of Property, Freehold and Leasehold Properties, Sinking Fund, Amortization, Depreciation and Obsolescence, Outgoings, Gross Income and Net Income, Capitalized value, Deferred Land Value, Year's Purchase, Rate of Interest, Mortgage, Legal Mortgage, Accommodation Land and Accommodation Works, Annuity, Land Valuation, Methods of Land Valuation, Rent fixation. 6. P.W.D. Accounts and Procedure for Works: Organization of Engineering Department, Works, Classification of Works, Methods of Carrying out Works, Measurement Book, Stores, Stock, Issue Rates, Tools and Plants, Mode of Payment, Public Works Account, Power of Sanction, Duties of Overseers Travelling Allowances. 	
Course No.		

Course No.	CEL305	Open Course (Y/N)	HM Course (Y/N)	Discontinued (Y/N)	
Course Title	<u>Design of RCC Structures</u>				
Course Coordinator	Dr. A. D. Pofale				
Slot in which offered. If not offered write N	Odd		Even		
			H		
Structure	Lecture	Tutorial	Practical	Credits	
	3	0	0	6	
Prerequisite Course Codes As per proposed Course Numbers	AM** Structural Analysis & 3CE***Concrete Engineering				
Prerequisite credits					
Equivalent Course Codes. As per proposed courses and old courses	461 Structural Design II (RCC)				
Overlap course codes As per proposed Course Numbers	461 Structural Design II (RCC)				
Text Book (Max. 2)	Title		Limit state design of Reinforced Concrete Structures		
	Author		Varghese P.C.;		
	Publisher		Prentice Hall of India		
	Edition		1999		
	Title		Limit State Theory and Design of Reinforced Concrete.		
	Author		Karve S.R.& Shah V.L		
	Publisher		Structures Publications, Pune.		
	Edition		2007.		
Reference Books	Title		Reinforced Concrete Design,		
	Author		S.U.Pillai ,D.Menon:		
	Publisher		Tata Mcgraw-Hill Publishing Company New Delhi		
	Edition		2003.		
	Title		Limit state Design		
	Author		Ramchandra.		
	Publisher		Standard Book House		
	Edition		1990		
	Title		I.S.456-2000: Plain and reinforced concrete, Code of Practice,		
	Author				
	Publisher		Bureau of Indian Standards		
	Edition		2000		
	Title		I.S.3370-1967: Part I, II and Part IV, Code of		

		Practice for Concrete structures for storage of liquids.
	Author	
	Publisher	Bureau of Indian Standards
	Edition	1967
	Title	S.P. (16): Design Aids for Reinforced Concrete. (Interaction Charts Only)
	Author	
	Publisher	Bureau of Indian Standards
	Edition	1980
Content		<ol style="list-style-type: none"> 1. Limit state Design Concept; Partial safety factors, load factors, stress-strain relationship, stress block parameters, failure criteria, Use of I.S. 456-2000, Limit state of collapse in flexure : Design of one way single span and continuous slabs, canopies and two way slabs with various end conditions using IS code coefficients. Analysis and Design of Singly and Doubly reinforced Beams, “T” and “L” beams. 2. Moment redistribution: Analysis and design of fixed beams, propped cantilever, two span symmetric continuous beams. Limit State of collapse in shear, Bond and Torsion, Design for Interaction between Bending moment, Torsional moment and Shear. Limit state of serviceability: Deflection and moment curvature relationship, for beams and one-way slabs. 3. Limit state of collapse under compression: Axially loaded short and long column, column with axial load, uniaxial and biaxial moment, Interaction diagram / Charts. Isolated footing for axially loaded columns, Uniaxial bending, combined footing: Rectangular footing, Strap beam, Trapezoidal, raft etc. 4. Analysis and design of portal frames (single bay single storey) hinged or fixed at base. Design of Cantilever & Counterfort Retaining Walls. 5. Design of Dog legged and Open Well Staircase. 6. Design of Circular and Rectangular water tank with roof slab / dome resting on ground by approximate method. (Using Working Stress Method)

Course No.	AML 363	Open course (Y/N)	HM course (Y/N)	Discontinued (Y/N)	
Course Title	Design of Steel Structures				
Course Coordinator	Dr. L.M. Gupta				
Slot in which offered. If not offered write N	Odd		Even		
	A				
Structure	Lecture	Tutorial	Practical	Credits	
Prerequisite Course Codes As per proposed Course Numbers					
Prerequisite credits					
Equivalent Course Codes. As per proposed courses and old courses					
Overlap course codes As per proposed Course Numbers					
Text Book (Max. 2)	Title				
	Author				
	Publisher				
	Edition				
	Title				
	Author				
	Publisher				
	Edition				
Reference Books	Title	“Design of Steel Structures”,			
	Author	Negi, B.S.			
	Publisher	Tata McGraw Hill			
	Edition				
	Title	“Design of Steel Structures”			
	Author	Dayaratanam, P			
	Publisher	A.H. Wheeler & Co. Ltd.,; Allahabad, 1990.			
	Edition				
	Title	“Steel Structure Vol. I & II”			
	Author	Ram Chandra.,			
	Publisher	Standard Publishers; Delhi.			
	Edition				

	Title	“Design of Steel Structures”
	Author	Gaylords, E.H. & Gaylords, C. N.,
	Publisher	McGraw Hill Publication
	Edition	
	Title	“Design of Steel Structures as per IS:800-2007”
	Author	N. Subramaniam
	Publisher	Oxford university press.
	Edition	
Content	<p>Steel as a structural material, various grades of structural steel, properties, various rolled steel sections (including cold formed sections, structural pipe (tube) sections) and their properties. Introduction to I.S. 800, 808, 816, 875, 1893 etc.; Design of axially loaded members: (a) Tension members (b) Compression members</p> <p>Design of roof truss: Load assessment for DL, LL and WL</p> <p>Design of simple and built up beams: Laterally restrained and unrestrained, (symmetrical as well as unsymmetrical section). Curtailment of flange plates. Design of welded plate girder, concept of gantry girder.</p> <p>Design of single rolled steel section column subjected to axial load and biaxial moment including base design.</p> <p>Design of axially loaded built up columns. Laced and battened (Column bases slab base gusseted base moment resistant bases)</p> <p>Structural Fasteners: a) Behavior of bolted and welded connections (types, Designations, properties, permissible stresses), failure of bolted and welded joints. Strength of bolt and strength of weld. Efficiency of joints. Design of simple bolted and welded connections. (b) Moment resistant bolted and welded connection (bending and torsion);</p> <p>Design of connection: Beam to beam, beam to column: framed connection. Seismic coefficient method [IS1893 (part I): 2002, seismic design and detailing of steel structures.</p>	
Course No.		