

Course No.	CEL309	Open Course (Y/N)	HM Course (Y/N)	Discontinued (Y/N)
Course Title	Fluid Mechanics			
Course Coordinator	Dr A D Ghare			
Slot in which offered. If not offered write N	Odd		Even	
	N		N	
Structure	Lecture	Tutorial	Practical	Credits
	3	0	2	8
Prerequisite Course Codes As per proposed Course Numbers	Basic Fluid 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	Engineering Fluid Mechanics		
	Author	Garde R.J. and Mirajgaokar A.G.;		
	Publisher	Scitech Publication		
	Edition	2003		
	Title	Theory and Applications of Fluid Mechanics		
	Author	Subramanya K.		
	Publisher	Tata McGraw Hill Publication		
	Edition	1996		
Reference Books	Title	Fluid Mechanics,;		
	Author	Streeter V.L. and Wyle E.B.;		
	Publisher	International Students Edition		
	Edition	1986		
	Title			
	Author			
	Publisher			
	Edition			
	Title			
	Author			
	Publisher			
	Edition			
	Title			
	Author			
Publisher				
Edition				

	Title	
	Author	
	Publisher	
	Edition	
	Title	
	Author	
	Publisher	
	Edition	
Content	<p>Relative equilibrium of fluids, Liquid masses subjected to uniform horizontal and vertical acceleration, Acceleration of fluid mass along a slope, Free and forced vortex, Velocity potential function and stream function, circulation, Kinetic energy correction factor, Momentum correction factor,</p> <p>Boundary Layer Theory, Displacement thickness, Momentum thickness, Laminar boundary layer</p> <p>Forces on immersed bodies, Drag and Lift, Magnus effect</p> <p>Viscous flow, Laminar incompressible flow in a circular pipe, Moody's diagram, two dimensional laminar flow between parallel plates</p> <p>Dimensional Analysis and Model Analysis (undistorted models), Reynold's law and Froudes law of similarity</p> <p>Uniform flow computations in open channels, Critical Flow computations in open channel</p>	
Course No.	CEL309	

Course No.	CEL4xx	Open Course (Y/N)	HM Course (Y/N)	Discontinued (Y/N)	
Course Title		Disaster Management			
Course Coordinator		Dr. Rahul V. Ralegaonkar			
Slot in which Offered		ODD		EVEN	
				A	
Structure		Lecture	Tutorial	Practical	Credits
		3	0	0	6
Prerequisite Course Codes					
Prerequisite Credits					
Equivalent course Codes					
Overlap Course Codes					
Text Books		Title	Disaster Management: Text & Case Studies		
		Author	D B N Murthy		
		Publisher	Deep & Deep Pvt. Ltd.		
		Edition			
		Title	Encyclopedia of Disaster Management		
		Author	S L Goel		
		Publisher	Deep & Deep Pvt. Ltd.		
		Edition			
Reference Books		Title	Disaster Management		
		Author	G K Ghosh		
		Publisher	A P H Publishing Corporation		
		Edition			
		Title	Citizen's Guide to Disaster Management		
		Author	Satish Modh		
		Publisher	Macmilan		
		Edition			
		Title			
		Author			
		Publisher			
		Edition			
		Title			
		Author			
		Publisher			
		Edition			
Content		Theory:			

	<ol style="list-style-type: none"> 1. Introduction to Disasters- Overview, Classifications, causes, loss of resources 2. Disaster Risk Management- Objectives, Processes, Events, analysis, base-line data, forecasting and warning. 3. Emergency operation centre and IT aids- physical environment, IT Aids, Applications. 4. Techno-legal & Techno-financial aspects- regulatory mechanism for compliance, administrative structure for legal framework, additional cost on infrastructure, building by-laws. 5. Public-private agency co-ordination- federal, state and local disaster response organization and network, citizen and community role in disaster response and recovery. 6. Case studies: Natural and man-made disasters, preparedness and planning
Course No.	

Course No.:	CEL423	Open Course (Y/N)	HM Course (Y/N)	Discontinued (Y/N)
Course Title: Remote Sensing & GIS				
Course Coordinator: Dr. Y.B.Katpatal				
Slot in which offered, if not offered write N	Odd		Even	
	A			
Structure	Lecture	Tutorial	Practical	Credits
	3	0	2	8
Prerequisite Course Codes As per proposed Course numbers				
Prerequisite Credits				
Equivalent Course Course Codes. As per proposed Courses & old courses				
Overlap Course Codes As per proposed Course numbers				
Text Book (Max. 2)	Title	Remote Sensing and Geographical Informati0n Systems		
	Author	M. Anji Reddy		
	Publisher	BS Publications		
	Edition	Third Edition		
	Title	Concepts and techniqes of Geographic Infromation Systems		
	Author	C.P LO Albert KW Yeung		
	Publisher	Pritince Hall of India		
	Edition	2002		
Reference Books	Title	Remote Sensing of the Environment ..an Earth Resource Perspective		
	Author	John R Jensen		
	Publisher	Pearson Education		
	Edition	2006		
	Title	Keith C. Clerk, Bradely O Parks, Michel P Crane		
	Author	Geographic Informaiton System and Enviornment Modeling		
	Publisher	Pritince Hall of India		
	Edition	2002		
	Title	Remote Sensing and GIS		
	Author	B. Bhatta		
	Publisher	Oxford University press		
	Edition	First Edition		

Content	<p>Definition & Scope of Remote Sensing: Electromagnetic energy & spectrum, Remote Sensing Systems, Sensors & Scanners, Resolution of sensors, Multispectral, thermal & Radar data . Radiometers, spectral Signatures.</p> <p>Elements of Remote Sensing Systems: Terrestrial, airborne & space borne platforms, sunsynchronous & Geostationary satellites. Various earthresources satellites, Indian Remote sensing Programs. Remote Sensing Data products & their types: Analogue & Digital data Formats, errors. Interpretation Techniques: Elements & Methods of interpretation, Relief displacement and vertical exaggeration, determination & calculation of elevation from Remote Sensing Data.</p> <p>Digital Image Processing: Image rectification & restoration, image enhancements, image classification; supervised & unsupervised, accuracy assessments.</p> <p>Geographical Information Systems: Raster & Vector Data, Components of GIS, concepts & basic characteristics of Vectorization, topology generation, attribute data attachment, editing and analysis. Global Positioning Systems: Types and method.</p> <p>Applications : Integrated approach of RS & GIS application; Geotechnical investigations (soil studies, dam site studies), water resources management, environmental studies (EIA and Land Use Land cover studies), transportation planning, Urban Planning, E-Governance.</p>
Practical	<ol style="list-style-type: none"> 1. RS Data formats & their study; analogue & digital data products 2. Image registration 3. Digital enhancement 4. Image classification 5. GIS : Vector data generation, Data attachments and analysis 6. Calculation of Elevation from RS data 7. Data analysis in GIS 8. Case studies: Water resources, environmental applications, geotechnical investigations
Course No.	

Course No.	CEL410	Open course (Y/N)	HM Course (Y/N)	Discontinued (Y/N)		
Course Title	Traffic Engineering					
Course Coordinator	Dr. Vishrut Landge					
Slot in which offered. If not offered write N	Odd		Even			
			F			
Structure	Lecture	Tutorial	Practical	Credits		
	3		0	1		
Prerequisite Course Codes As per proposed Course Numbers	Transportation engineering					
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	Traffic and Highway Engineering				
	Author	Garber N.J. & Lester A. Hoel				
	Publisher	West Publishing Co. New York				
	Edition					
	Title	Traffic Engineering				
	Author	Roger P. Roess, Elena S. Prassas & William R. Mcshane				
	Publisher	John Willey & Sons				
	Edition					
	Reference Books	Title	Decision Making on Mega Project: Cost Benefit Analysis, Planning and Innovation (Transport Economics, Management and Policies)			
		Author	Priemm H., Bentt F. & Bert Van Bee			
Publisher		Edward Elgar Publishing Limited				
Edition						
Title		An Introduction to Transportation Engineering				
Author		William W. Hay				
Publisher		John Willey & Sons				
Edition						
Title		Fundamentals of Transportation Engineering				
Author		Robert G. Hennes and Martin Eske				
Publisher		McGraw Hill Book Co. New York				
Edition						
Title		Fundamentals of traffic engineering				
Author		Norman Kennedy				
Publisher		Institute of Transportation and Traffic Engineering, University of California				
Edition						

	Title	Traffic Flow Theory and Control
	Author	Donald R. Drew
	Publisher	Institute of Transportation and Traffic Engineering, University of California
	Edition	
	Title	Urban Transportation Planning
	Author	Michael Meyer & Eric J. Miller
	Publisher	
	Edition	
Content	<p>Traffic Engineering & Studies: Definition, Scope, Various organization working in traffic research, Elements of traffic , characteristics of vehicle, road user and road; traffic studies-speed & delay, traffic volume, O & D, parking and accidents, sample size, study methodology, data collection & presentation,</p> <p>Traffic Control & Safety and Enforcement & Education: Traffic signs, road markings, traffic signals-design of signalized intersections and signaling systems, conflict points, traffic manoeuvres, different intersections, queuing Theory, Traffic control aids, and street furniture. Driver error, vehicle & road surface. Traffic accident scenario in India. Collection and interpretation of accident data and recording in Std. forms skidding, speed and weather effects on accidents, Analysis of Accidents, Pedestration cyclists & auto vehicle drivers safety. Traffic 3R and 5E's of traffic management. Motor Vehicle act and Rules, Education, Need and Methods, Air pollution & Noise Pollution by Traffic, Pollution standards for auto vehicles, PUC</p> <p>Traffic Capacity analysis : Speed, volume, parking & accident data analysis, statistical approach, , , traffic stream characteristics-relationship between speed, flow and density, level of service & capacity analysis, traffic forecasting.</p> <p>Traffic Design: Channelisation of islands for different traffic situations, design of rotaries & at-grade intersections, grade separated intersections, their warrants; facilities for pedestrian & bicycle ways, bus stop location and bus bay design, transport terminals, parking parcels, design of road lighting at different road sections & intersections.</p> <p>Traffic Control Devices: Traffic signs, markings and signals; principles of signal design, Webster's method, signal coordination.</p> <p>Traffic Regulation & Management: Speed, vehicle, parking, enforcement regulations, mixed traffic regulation, management techniques-one-way, tidal flow, turning restrictions etc., road safety measures</p> <p>Traffic Flow theory Introduction</p>	

Course No.	CEL208	Open Course (Y/N)	HM Course (Y/N)	Discontinued (Y/N)	
Course Title	Hydrology				
Course Coordinator	Prof. A. D. Vasudeo				
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					
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	Elementary Engineering Hydrology			
	Author	M. J. Deodhar			
	Publisher	Pearson Education			
	Edition	2009			
	Title	Hydrology			
	Author	Raghunath H M			
	Publisher	Wylie Publication			
	Edition	1996			
Reference Books	Title	Applied Hydrology			
	Author	Chow Ven Te, Maidment R David, Mays W Larry			
	Publisher	McGraw-Hill New Delhi			
	Edition	1998			
	Title	Engineering Hydrology			
	Author	Subramanya K			
	Publisher	Tata McGraw-Hill, New Delhi			
	Edition	1996			
	Title				
	Author				
	Publisher				
	Edition				
	Title				
	Author				
Publisher					

	Title	
	Author	

	Publisher	
	Edition	
	Title	
	Author	
	Publisher	
	Edition	
Content	<p>Introduction:, Hydrological cycle, Precipitation- forms and types</p> <p>Abstractions :Infiltration, Evaporation, Transpiration, Evapotranspiration, Interception.</p> <p>Runoff: Sources and components of runoff, Classification of streams and measurement of discharge of a stream by Area – Slope and Area – Velocity methods.</p> <p>Hydrograph: Flood hydrographs and its components, S-Curve technique, unit hydrograph, synthetic hydrograph. Statistical Methods, Various methods of averages, probability of an event, Frequency analysis.</p> <p>Floods: Causes and effects, Factors affecting peak flows and its estimation, Flood routing and Flood forecasting.</p> <p>Groundwater: Introduction, Occurrence and distribution of Groundwater, Water table, Darcy’s law. Introduction to hydraulics of wells, Open wells - yield test.</p>	
Course No.	CEL208	

Course No.	CEL424	Open Course (Y/N)	HM Course (Y?N)	Discontinued (Y/N)
Course Title	Environmental Studies			
Course Coordinator	Dr. Ajay Kalamdhad and Dr. M.V. Latkar			
Slot in which offered. If not offered write N	Odd	Even		
	B			
Structure	Lecture	Tutorial	Practical	Credits
	3	0	0	6
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	Environmental Studies		
	Author	Rajgopalan R.		
	Publisher			
	Edition			
	Title	Environmental Studies		
	Author	Benny Joseph		
	Publisher	McGraw Hill		
	Edition			
Reference Books	Title	Environmental Studies		
	Author	Erach Barucha		
	Publisher	University press (UGC)		
	Edition			
	Title			
	Author			
	Publisher			
	Edition			
	Title			
	Author			
	Publisher			
	Edition			
	Title			
	Author			
	Publisher			
	Edition			

	Title	
	Author	
	Publisher	
	Edition	
	Title	
	Author	
	Publisher	
	Edition	
Content	<p>Natural resources: Forest resources, Water resources, Mineral resources, Food resources, Energy resources, Land resources.</p> <p>Ecosystem: Concept of an ecosystem, Structure and functions of an ecosystem, Procedures, consumers and decomposers, Ecological succession, Food chain, food webs and pyramids.</p> <p>Biodiversity and its conservation: Introduction, definitions: genetics, species and diversity, Value of biodiversity, Biodiversity at global, national and local level, India as a mega-diversity nation, Hot-spot of biodiversity, Threat to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts, Conservation of biodiversity: in-situ and ex-situ conservation.</p> <p>Environmental pollution: Definition, Causes, effects and control measures of: Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards, Solid waste management: Causes, effects and control measures of urban and industrial wastes.</p> <p>Social issues and environment: Sustainable development, Water conservation, Rain water harvesting, Watershed management, Climate change, Global warming, Acid rain, Ozone layer depletion, Nuclear accident, Holocaust, Environmental rules & regulations.</p> <p>Human population and environment: Population growth, Environment and human health, Human rights, Value education, Role of information technology in environment and human health.</p>	
Course No.		

Course No.	CEL311	Open Course (Y/N)	HM Course (Y/N)	Discontinued (Y/N)		
Course Title	Pavement design					
Course Coordinator	Dr. Vishrut Landge					
Slot in which offered. If not offered write N	Odd		Even			
	C		Even			
Structure	Lecture	Tutorial	Practical	Credits		
	3	1	0	8		
Prerequisite Course Codes As per proposed Course Numbers	Transportation Engineering					
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	Pavement Design and Materials				
	Author	A.T. Papagiannakis & E.A. Masad				
	Publisher	John Willey & Sons				
	Edition					
	Title	Highway Materials, Soils, and Concretes				
	Author	Harold Atkins				
	Publisher	Prentice Hall Company				
	Edition					
	Reference Books	Title	Highway Engineering			
		Author	Paul H. Wright and Karen Dixon			
		Publisher	John Willey & Sons			
		Edition				
Title		Highways: The Location, Design, Construction and Maintenance of Road Pavements				
Author		O' Flaherty & Coleman.A.				
Publisher		Edward Arnold U.K.				
Edition						
Title		Principles of Pavement Design				
Author		Yoder C.J. & Witzak M.W.				
Publisher		John Willey & Sons				
Edition						
Title		Pavement Management Systems				
Author		Ralph C. G. Haas				
Publisher		McGraw Hill Book Co. New York				
Edition						
Title		Performance and Durability of Bituminous Materials				
Author		J. G. Cabrera				

	Publisher	John Willey & Sons
	Edition	
	Title	
	Author	
	Publisher	
	Edition	
Content	<p>General : Structural action of flexible and rigid pavements. Characteristics of highway and airfield pavements. Design Parameters: Standard Axie load and wheel assemblies for road vehicles Under carriage system for aircraft, Tyre and contact pressure, contact area imprints, Computations of ESWL for flexible and rigid pavements. Load repetitions and distributions of traffic for highway and airfield pavement, airport traffic areas. Material Characteristics: AASHO subgrade soil classification. Group index, CBR, North Dakota cone bearing value, plate load test for “K”, Marshal’s method of Bituminous mix design. Modulus of rupture and elasticity, poisson’s ratio & coefficient of thermal expansion of concrete. Layer equivalency concepts.</p> <p>Analysis of Flexible and Rigid Pavements: Stress, Strain deformation analysis for single, two three and multi layered flexible pavement systems. Stress and deflections for rigid pavements due to load and temperature, influence Charts, ultimate load analysis, joints in C.C. pavements.</p> <p>3. Highway Pavement Design:</p> <p>(a) Flexible: North Dakota cone, Group index, CBR, IRC-37, Brumister, Triaxial (Kansas), AASHO method of design.</p> <p>(b) RIGID IRC-58, P.C.A., AASHO method of design, Design of joints and reinforcement.</p> <p>Airfield Pavement Design:</p> <p>(a) Flexible: U.S. Corps of Engineering, CBR, FAA, Mcload(Canadian)</p> <p>(b) Rigid: PCA, FAA & LCN, ultimate load Analysis yield lines patterns, methods.</p> <p>4. Pavement Testing and Evaluation: Trial & Inspection Pits, Field Density, CBR, plate load Test, condition surveys and surface evaluation for unevenness, rut depth, profilometers, Bump integrators, Benkalman Beam Deflection Study. Straightening of Pavement: Design of flexible, composite and rigid overlays for flexible and rigid pavements, Repairs, Maintenance and rehabilitation of pavements. Specifications and Cost Estimates: Review of IRC/MORTH/ICAO/NAAI specification and standards for highway and airfield construction. Cost evaluation and comparative study. Pavement Management Systems, case studies of Highway and Airfield pavement projects.</p>	
Course No.		

Course No.	AML3xx	Open course (Y/N)	HM Course (Y/N)	Discontinued (Y/N)	
Course Title	Advance Structural Analysis				
Course Coordinator					
Slot in which offered. If not offered write N	Odd		Even		
	E				
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				
	Author				
	Publisher				
	Edition				
	Title				
	Author				
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	Title	
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	Author	
	Publisher	
	Edition	
Content		
Course No.		

Course No.	CEL 406	Open Course (Y/N)	HM course (Y/N)	Discontinued (Y/N)	
Course Title	<u>Advanced Concrete Technology</u>				
Course Coordinator	Dr. A. D. Pofale / A.G. Tawalare				
Slot in which offered. If not offered write N	Odd		Even		
	H		N		
Structure	Lecture	Tutorial	Practical	Credits	
	0	0	2	2	
Prerequisite Course Codes As per proposed Course Numbers	3CE*** Concrete Engineering				
Prerequisite credits					
Equivalent Course Codes. As per proposed courses and old courses	CEL487 Advanced Concrete Technology				
Overlap course codes As per proposed Course Numbers	CEL487 Advanced Concrete Technology				
Text Book (Max. 2)	Title	Concrete Technology			
	Author	Gambhir M.L:			
	Publisher	Tata McGraw Hill			
	Edition	(Second Edition) 1995			
	Title	Concrete Technology			
	Author	M.S.Shetty			
	Publisher	S.Chand & Company New Delhi			
	Edition	2005			
Reference Books	Title	Concrete microstructure, properties & materials,			
	Author	P.Kumar Mehata, Paulo & J.M. Monteiro,			
	Publisher	Prentice Hall INC & Mcgraw Hill USA			
	Edition				
	Title	Light Weight Concrete,			
	Author	Short & Kenniburg,			
	Publisher	Asia Publishing House, Bombay			
	Edition	1963			
	Title	Concrete Technology -Vol I. & II			
	Author	Orchard D.F.;			
Publisher	Applied Science Publishers				
Edition	(Fourth Edition) 1979				
	Title	Properties of Concrete			
	Author	Neville A.M., J.J.Brook			
	Publisher	Addison Wesley			
	Edition	1999			
	Title				

	Author	
	Publisher	
	Edition	
Content	<ol style="list-style-type: none"> 1. Review of properties of cement, their physical and chemical properties, special purpose cements, Classification and properties of aggregates, soundness of aggregates, alkali aggregate reaction, thermal properties of aggregates, Importance of shape and Surface area and grading, gap graded and aggregates. Admixtures & construction chemicals, Use of Fly Ash, Silica Fumes, Metakaolin & GGBS in concrete 2. Rheological behavior of concrete, requirements of workability of concrete, Effect of environmental conditions, Strength properties of hardened concrete, Impact, Dynamic and fatigue behaviour of concrete, shrinkage and creep of concrete, behaviour of concrete under fire. 3. Permeability and Durability of concrete, Parameters of durability of concrete, chemical attack on concrete, Production of concrete; batching mixing, transportation, placing, compaction of concrete. Special methods of concreting and curing of concrete, Hot weather and cold weather concreting, Guniting (Shotcreting) 4. Concrete mix design, Basic considerations and choice a mix proportions, various methods of mix designs including IS Code method. Quality control and quality assurance of concrete, Acceptance criteria, Quality management in concrete construction, Inspection and testing of concrete. Non-destructive testing of concrete, core test and load test. 5. Special concrete such as high strength, Lightweight, heavy weight, vacuum processed concrete, Mass concrete, high performance concrete, Pumpable concrete, Self Compacting concrete, Air entrained concrete, Ferro cement, fiber reinforced concrete, Polymer impregnated concrete. Jet concrete. Deterioration and repair technology of concrete, Distress and type of repairs, crack sealing techniques 	
Course No.		

Course No.	CEP406	Open Course (Y/N)	HM Course (Y/N)	Discontinued (Y/N)	
Course Title	<u>Advanced Concrete Technology</u>				
Course Coordinator	Dr. A. D. Pofale / A.G. Tawalare				
Slot in which offered. If not offered write N	Odd			Even	
	7th			N	
Structure	Lecture	Tutorial	Practical	Credits	
	3	0	2	8	
Prerequisite Course Codes As per proposed Course Numbers	3CE*** Concrete Engineering				
Prerequisite credits					
Equivalent Course Codes. As per proposed courses and old courses	CEL487 Advanced Concrete Technology				
Overlap course codes As per proposed Course Numbers	CEL487 Advanced Concrete Technology				
Content	<ol style="list-style-type: none"> 1. Verification of Physical properties of concrete by using chemical admixture 2. Design of high strength concrete mixes 3. Vee Bee Test on concrete 4. Flow Test on concrete 5. Design of Concrete Mix by IS code method 6..Modulus of Rupture of Concrete 7. Determination of Static and Dynamic modulus of elasticity of concrete 8. Fatigue properties of concrete study / experiment 9. Test on Self Compacting concrete 10. Rheological behavior of concrete. 				
Course No.					

Course No.	CEL411	Open Course (Y/N)	HM Course (Y/N)	Discontinued (Y/N)	
Course Title	Geotechnical Engineering				
Course Coordinator	D J Katyayan				
Slot in which offered.	Odd		Even		
If not offered write N	N		N		
Structure	Lecture	Tutorial	Practical	Credits	
	3	0	0	6	
Prerequisite Course Codes As per proposed Course Numbers	Soil Mechanics Foundation Engineering				
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.				
Content	1. Clay mineralogy : Concept of composition classification and nomenclature, structure of clay minerals, Kaolinite Illite, Montmorillonite groups physical properties, clay water relation				

	<p>thixotropy electrical effects, electrosmosis, streaming potential Zeta potential.</p> <ol style="list-style-type: none"> 2. Drainage and Dewatering : Various systems of and there Graded filters and design Criteria applications of Geomembranes. 3. Expansive Soils : Identification and classification Measurement of swelling pressure (vertical) and potential Foundation problems, different types of foundation design principles Latest technique to tackle expansive nature. 4. Compaction & field compaction and controls : Mechanics, Lab & Fd. Tests, Fd. Compaction equipments & these choice and suitability, quality control, Deep compaction, Vibro floatation. 5. Consolidation : Terzaghi's theory for two & three dimensional consolidation field and laboratory tests. Consolidation settlements and drains. 6. Soil stabilization, Mechanical and Chemical stabilization, Lab. & Investigations, Field Techniques, Advanced Techniques in Geotextile applications, Stone columns and Gabions. 7. Case studies of Applications
Course No.	

COURSE CONTENT PROFORMA				
Course No.	CEL310	Open Course (Y/N)	HM Course (Y/N)	Discontinued (Y/N)
Course Title	Energy Efficient Buildings			
Course Coordinator	Dr. Rahul V. Ralegaonkar			
Slot in which Offered	ODD		EVEN	
	H			
Structure	Lecture	Tutorial	Practical	Credits
	3	1	0	8
Prerequisite Course Codes				
Prerequisite Credits				
Equivalent course Codes				
Overlap Course Codes				
Text Books	Title	Energy Efficient Buildings In India		
	Author	Mili Majumdar		
	Publisher	Tata Energy Research Institute		
	Edition			
	Title	Energy-Efficient Building Systems		
	Author	Lal Jayamaha		
	Publisher	McGraw Hill Publication		
	Edition			
Reference Books	Title	Solar Energy Fundamentals & Applications		
	Author	H P Garg, J Prakash		
	Publisher	Tata MacGraw Hill Publishing		
	Edition			
	Title	Solar Energy and thermal processes		
	Author	J A Duffie & W A Beckman		
	Publisher	John Wiley		
	Edition			
	Title	Solar Energy Applications in Buildings		
	Author	A A M Sayigh		
	Publisher	Academic Press		
	Edition			
	Title			
Author				
Publisher				
Edition				

Content	<p>Theory:</p> <ol style="list-style-type: none"> 1. Conservation & energy efficiency concepts-overview of significance of energy use and energy processes in buildings 2. Passive solar energy fundamentals & practices in building design- solar astronomical relations and radiation physics and measurements, human thermal comfort, climatological factors, material specifications and heat transfer principles. 3. Passive solar energy practice in building design- design decisions in building-location, orientation, form, material, Thermal performance evaluation 4. Passive Solar technologies- trombe wall, thermosiphoned mass wall, water wall, sunspaces, roof ponds, glazed windows, cool towers, under slab rock beds 5. Design Guidelines & Economic Optimization- Concept of cost/benefit of energy conservation & passive solar technologies 6. Advances in computational energy conservation- implementation of computer energy simulation programs into solar designs.
Course No.	

Course No.	CEL409	Open course (Y/N)	HM Course (Y/N)	Discontinued (Y/N)	
Course Title	Quality & Safety in Construction				
Course Coordinator	Prof S.P.Wanjari				
Slot in which offered. If not offered write N	Odd		Even		
	N		N		
Structure	Lecture	Tutorial	Practical	Credits	
	3	0	0	6	
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	Construction Planning & Management			
	Author	P.S. Gahlot & B.M. Dhir			
	Publisher	New Age International (P) Ltd.			
	Edition				
	Title				
	Author				
	Publisher				
	Edition				
Reference Books	Title	Total Quality in Construction Projects			
	Author	Ron Baden			
	Publisher	Thomas Telford, London			
	Edition				
	Title	Engineered Quality in Construction			
	Author	Michael T. Kubal			
	Publisher	McGraw Hill			
	Edition				
	Title	Safety Health & Welfare Manual			
	Author				
	Publisher				
	Edition				
	Title	Hand book of OSHA Construction Safety & Health			
	Author	Charles D. Reese & James V. Edison			
Publisher	CRC Press, 1999				
Edition					

	Title	
	Author	
	Publisher	
	Edition	
	Title	
	Author	
	Publisher	
	Edition	
Content	<ol style="list-style-type: none"> 1 Total quality Management (TQM) to the construction industry: Evolution, philosophy and principles for building client, the Deming Philip Crosby, J.M. Juran contribution to TQM Quality as a management process, contractual options and integration. 2 2. TQM to construction Projects : General application, TQM in precontract, post contract, commissioning and maintenance phase, project quality management . 3 Auditing: First party auditing second party auditing, contraction management adjudication. 4 Accidents: Types causes, direct and indirect cost of accidents, objective of accident prevention programmes. 5 Preventative measures : personal protective equipments, job requirements, tool equipments and fire protection measures. Projection from radioactive /toxic materials, laser and x-ray equipment. 6 Safety Organization and Management: Safety policies, safety organization, safety committees, safety representatives, outside agencies – Govt. intervention, international agreements. 	

Course No.	CEL413	Open Course (Y/N)	HM Course (Y/N)	Discontinued (Y/N)	
Course Title	<u>Prestressed Concrete Structures</u>				
Course Coordinator	Dr. A. D. Pofale / A.G. Tawalare				
Slot in which offered. If not offered write N	Odd		Even		
	G				
Structure	Lecture	Tutorial	Practical	Credits	
	3	1	0	8	
Prerequisite Course Codes As per proposed Course Numbers	3CEL-*** RCC Structures				
Prerequisite credits					
Equivalent Course Codes. As per proposed courses and old courses	CEL486 Prestressed Concrete				
Overlap course codes As per proposed Course Numbers	CEL486 Prestressed Concrete				
Text Book (Max. 2)	Title	Prestressed Concrete			
	Author	N. Krishnaraju			
	Publisher	Tata McGraw Hill			
	Edition	(Third Edition) 1981			
	Title	Prestressed Concrete			
	Author	N. Rajgopalan,			
	Publisher	Narosa Publishing House, Mumbai			
	Edition	Second Reprint 2007.			
Reference Books	Title	Design of Prestressed Concrete Structures.			
	Author	Lin T.Y, Burns N.H.			
	Publisher	John Wiley & sons			
	Edition	(Third Edition).1982			
	Title	Prestressed concrete (First Edition);			
	Author	Pandit G.S. & Gupta S.P.			
	Publisher	CBS Publishers., New Delhi			
	Edition	first reprint, 1995			
	Title	Prestressed Concrete Design & Construction			
	Author	Leonhardt F. , Ernst Wilhelm and Sohen			
	Publisher	Berlin			
	Edition	1964			
	Title	I.S.1343-1980;Code of Practice for Prestressed Concrete,			
	Author				
	Publisher	Bureau of Indian Standards.			
	Edition	1980			
	Title				
	Author				
	Publisher				

	Edition	
Content		<ol style="list-style-type: none"> 1. Design of high strength concrete mixes. Loss of prestress in single span and continuous beams. Use of IS 1343-1980, Analysis Limit State Design of beams for Tension Type II and III problems, Cracking moment, untensioned reinforcement, Partial prestressing, Stress Corrosion. 2. Transfer of prestress by bond, Transverse tensile stresses, End zone reinforcement. Behaviour of Bonded and unbounded prestress concrete beams. 3. Deflection of Prestressed concrete members, short and long term, control of deflections. Crack width considerations. Flexural strength of prestressed concrete sections: Types of flexural failures, Limit state concept. 4. Shear resistance of prestressed concrete members: Principal stresses and ultimate shear Resistance, Design of shear reinforcement, prestressed concrete, members in Torsion, Design of reinforcement in torsion shear and bending. 5. Stress distribution in end block, Analysis and Anchorage Zone reinforcement. Composite Construction of prestressed precast and cast in situ concrete. Statically Indeterminate structures: Continuous beams, primary and secondary moments, Continuity, concordant cable profile, Analysis and Design of continuous beams. 6. Prestressed concrete pipes and poles. Design of Prestressed concrete tanks. Prestressing of dams and bridges: Method of construction. Stage prestressing, Dynamic and Fatigue behaviour of prestressed concrete.
Course No.		

Course No.:	CEL417	Open Course (Y/N)	HM Course (Y/N)	Discontinued (Y/N)
Course Title: Hazardous Waste Management				
Course Coordinator: Dr. Dilip H. Lataye				
Slot in which offered, if not offered write N	Odd		Even	
	B			
Structure	Lecture	Tutorial	Practical	Credits
	3	0	0	6
Prerequisite Course Codes As per proposed Course numbers				
Prerequisite Credits				
Equivalent Course Course Codes. As per proposed Courses & old courses				
Overlap Course Codes As per proposed Course numbers				
Text Book (Max. 2)	Title	Hazardous Waste Management,		
	Author	M. D. LaGrega, P.L.Buckingham and J.C.Evans		
	Publisher	McGraw-Hill, Inc., New York		
	Edition	1994		
	Title	International Perspective on Hazardous Waste Management,		
	Author	W.S.Forester and J.H.Skinner		
	Publisher	Mudra Offset Printers, Bajaj Nagar Nagpur		
Edition	2001			
Reference Books	Title	Hazardous Waste Management,		
	Author	G.W.Dawson and B.W.Mercer,		
	Publisher	Academic Press, Inc., London, England		
	Edition	1987		
	Title	Standard Handbook of Hazardous Waste Treatment and Disposal		
	Author	H.M.Freeman		
	Publisher	McGraw-Hill, Inc., New York		
	Edition	1989		
Title	Hazardous Waste Management Engineering,			
Author	E.J.Martin and J.H.Johnson, Jr.,			

	<table border="1"> <tr> <td>Publisher</td> <td>Van Nostrand Reinhold Co. Inc. New York.</td> </tr> <tr> <td>Edition</td> <td>1987</td> </tr> </table>	Publisher	Van Nostrand Reinhold Co. Inc. New York.	Edition	1987
Publisher	Van Nostrand Reinhold Co. Inc. New York.				
Edition	1987				
Content	Generation, storage, transportation, treatment, disposal, exchanges and minimization, legislative and technical aspects, current management practices; Environmental audits, pollution prevention, facility development and operations, treatment and disposal methods; physical, chemical, thermal, biological processes, land disposal with general applications to the industrial and energy-producing sectors, Site remediation. Special wastes, such as, infectious and radioactive waste.				
Course No.					

Course No.	CEL 418	Open Course (Y/N)	HM Course (Y/N)	Discontinued (Y/N)	
Course Title	ENERGY CONVERSION AND ENVIRONMENT				
Course Coordinator	Dr. A. R. Tembhurkar				
Slot in which offered. If not offered write N	Odd		Even		
	D		-		
Structure	Lecture	Tutorial	Practical	Credits	
	3	0	0	6	
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	Energy and the Environment			
	Author	Fowler J. M.			
	Publisher	McGraw Hill New York			
	Edition	2 nd			
	Title	Biomass for Energy in the Developing Countries, Current Roles, Potentials, Problems, Prospects			
	Author	D. O. Hall, G. W. Barnard and P. A. Moss			
	Publisher	Pergamon Press Ltd			
	Edition	1 st			
Reference Books	Title	Energy Management Handbook			
	Author	W. C. Turner			
	Publisher	Wiley Newyork			
	Edition	1 st			
	Title	Energy System Analysis for Developing countries			
	Author	P. Meier			
	Publisher	Sringer Verlag			
	Edition	1 st			
	Title	Energy from Bioconversion of Wate materials			
	Author	Dorthy J De Renzo			
	Publisher	Noyes data Corporation USA			
	Edition	1 st			
	Title	Energy from Solid Waste – Recent Development			
	Author	Francis A.Domino			
	Publisher	Noyes data Corporation USA			
	Edition	1 st			
	Title	Natural Resource Conservation – Management for			

		Sustainable Future
	Author	Oliver S. Owen , Daniel D. Chiras
	Publisher	Prentice Hall Publications
	Edition	6 th
	Title	Integrated Solid Waste Management
	Author	George Tachonobanoglous, Hilary Thesin, Samuel Vigil
	Publisher	McGraw Hill
	Edition	1 st International Edn.
Content	<p>Overview of Global and Indian Energy Scenario; Resource Conservation and Environmental Movement; Flow of Energy Through Ecosystem; Renewable and Non- Renewable Energy Sources; Sustainable System of Energy; Energy and Resources Conservation Strategies and Policies; Energy audit; Energy Conversion Methods: Thermal, hydro, nuclear, solar, wind, tidal, Energy Analysis; Energy economics; Future Energy Systems; Introduction to Fuel combustion fundamentals, formation of Pollutants, Measurements and Control; Alternative Energy sources Utilizations; Classification of Waste as Fuel; Waste to Energy options: Combustion, Gasification, anaerobic digestion, fermentation, pyrolysis; Fuels Derived from Waste to Energy Technology; Power Generation using Waste to Energy technology, Gas generations and collection in landfills, Potential for biomass and Biogas Energy system</p>	
Course No.	CEL 4xx	