

K L UNIVERSITY
DEPARTMENT OF CIVIL ENGINEERING
BOARD OF STUDIES MEETING

Meeting Particulars

Type of Meeting	COURSE CURRICULUM/BOS
Department Conducting the meeting	CIVIL ENGINEERING
Number of the Meeting	6
Date of Meeting	08.06.2016
Time of Meeting	9:30 A.M.
Venue of Meeting	HoD Chamber (Civil)

Agenda of the Meeting:

1. To consider the proposed 2016-17 admitted batch B. Tech Curriculum revision and make recommendations to the Academic Council KLU for approval of the same.
2. Any other points with permission of the Chair.

The following members were present:

S.No	Name of the Person	Institution	Department of the person	Designation of the Person	Position of the person in the meeting	Primary Responsibility if any
1	Dr. Ch. Hanumantha Rao	KLU	CIVIL	Professor & HoD	BOS Chairman	Chair the meeting, Document the proceedings of the meeting and forward the same to Academic Council
2	Dr. V. Ranga Rao	KLU	CIVIL	Professor	BOS Member	Involved in preparation of Structural Engineering syllabus
3	Dr. D.S.R Murthy	Andhra University	CIVIL	Professor	External Academic BOS	Review the existing and proposed system

Ch. Hanumantha Rao

					Member	and suggest suitable changes for the betterment of the courses
4	Dr. A. Siva Sankar	KLU	CIVIL	Professor	BOS Member	Involved in preparation of Geology syllabus
5	Mr. P. Sundara Kumar	KLU	CIVIL	Associate Professor	BOS Member	Involved in preparation of Water Resources Engineering syllabus
6	Dr. K. Raja Sekhar Reddy	KLU	CIVIL	Associate Professor	BOS Member	Involved in preparation of Geo Informatics syllabus
7	Mr.K. Hemantha Raja	KLU	CIVIL	Assistant Professor	BOS Member	Involved in preparation of Transportation Engineering syllabus
8	Mr. K. Shyam Chamberlin	KLU	CIVIL	Assistant Professor	BOS Member	Involved in preparation of Geotechnical Engineering syllabus
9	Mr. B.G. Rahul	KLU	CIVIL	Assistant Professor	Alumni BOS Member	Review the existing and proposed system and suggest suitable changes for the betterment of the courses
10	Ms. K. Prasanthi	KLU	CIVIL	Assistant Professor	BOS Member	Involved in preparation of Structural Engineering syllabus

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RESOLUTION



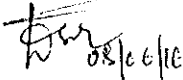

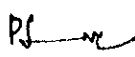
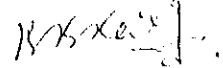

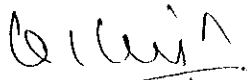

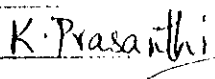
The BOS Committee resolved to recommend the following recommendations to the Academic council for the curriculum structure and syllabus for B. Tech Civil Engineering of 2016-17 admitted students.

1. The syllabus of the following courses is reviewed and revised:
 - a. Hydraulics and Hydraulic Machines
 - b. Surveying
 - c. Prestressed concrete
 - d. C programming and Data Structures
 - e. Rudiments of Communication Skills
 - f. Building Planning and Construction
2. The BOS committee discussed and resolved to recommend the optimum utilization of various softwares available in computer aided design lab for core courses where ever it is appropriate.
3. The BOS committee discussed and resolved to adopt innovative teaching pedagogies such as showing the relevant animations and quoting the live examples of construction activities going on in the campus.
4. The BOS committee discussed and resolved to improve the quality of major, minor project work, term paper and practice school.
5. The BOS committee discussed and resolved to prepare all the tutorial sheets in advance for courses having tutorial component.
6. The Curriculum Structure for 2016-17 admitted batch was approved by all members present in the meeting. The detailed Structure of 2016-17 is shown in Annexure-1.
7. It was resolved to approve all the recommendations/points mentioned in DAC meeting conducted on 31st October 2015.
8. It was resolved to approve all the recommendations/points mentioned in DAC meeting conducted on 11th February 2016, except point no. 1 which was partially approved.

Ch. Hanumali Rao

K L UNIVERSITY
DEPARTMENT OF CIVIL ENGINEERING
BOARD OF STUDIES MEETING

List of BOS Members:

S. No	Name	Designation of the Person	Institution	Signature
1	Dr. Ch. Hanumantha Rao	Professor & HoD	KLU	
2	Dr. V. Ranga Rao	Professor	KLU	
3	Dr. D.S.R Murthy	Professor	Andhra University	
4	Dr. A. Siva Sankar	Professor	KLU	
5	Mr. P. Sundara Kumar	Associate Professor	KLU	
6	Dr. K. Raja Sekhar Reddy	Associate Professor	KLU	
7	Mr.K. Hemantha Raja	Assistant Professor	KLU	
8	Mr. K. Shyam Chamberlin	Assistant Professor	KLU	
9	Mr. B.G. Rahul	Assistant Professor	KLU	
10	Ms. K. Prasanthi	Assistant Professor	KLU	

ANNEXURE-I

K L UNIVERSITY
DEPARTMENT OF CIVIL ENGINEERING
MAPPING OF Courses & Cos vs. PEOs (Undergraduate)-2016-17 Admitted Batch

Course Code	Course Title	CO NO	Description of the Course Outcome	a	b	c	d	e	f	g	h	i	j	k	FSO 1	FSO 2	Course Type	Rationale/Objective
15GN1001	Ecology and Environment	CO1	Understand the importance of Environmental education and conservation of natural resources							1						2	Retained	To understand the relation between biotic and abiotic components of the environment, impact of human activities on the environment and possible remedial measures to restore the environment.
		CO2	Understand the importance of ecosystems and biodiversity.								1					2	Retained	
		CO3	Understand the knowledge on solid waste management, disaster management and EIA process										1			2	Retained	
15GN1002	Human Values	CO1	Realize and understand the basic aspiration, harmony in the human being.						1						2		Retained	to understand the relations to be maintained with the co citizens to become a good citizen of the society
		CO2	Envisage the roadmap to fulfill the basic aspiration of human beings.						2						2		Retained	
		CO3	analyze the profession and his role in this existence.						2						2		Revised	
15EN1101	Rudiments of Communication Skills	CO1	Remember speech sounds and apply stress and intonation rules to enhance pronunciation skills						2						2		Revised	To bring about a consistent accent and intelligibility in students' pronunciation of English by
		CO2	Understand writing strategies and apply those by using the basic and advanced concepts of grammar							2					2		Revised	

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		CO3	Understand the types of texts and tone of the author.							2							providing an opportunity for practice in speaking
		CO4	Understand the importance of interpersonal skills														
15EN1202	Inter Personal Communication Skills	CO1	Understand the method of identifying the meaning of words and apply them in contexts.								2						To acquire the skills which are essential to communicate with the co employees and citizens effectively
		CO2	Understand and analyze different cultures and the importance of empathy in cross-cultural communication.									2					
		CO3	Understand and analyze seven techniques of reading and improve reading speed.										2				
		CO4	Understand and apply writing strategies in offices/ formal communication										2				
15 EN 2103P	Professional Communication Skills	CO1	Apply the various strategies of presentation Skills.									1					To acquire the skills which are Very essential to communicate with the co employees
		CO2	Analyze the given topics and situations and applying the strategies of group discussion.										2				
		CO3	Analyze the basic concepts of critical and analytical reading skills.											3			
		CO4	Apply the strategies of sentence formation and sentence completion.										1				
15 EN 2204	Employability Skills	CO1	Analyze one's own strength as a speaker/communicator and use discretion while listening														To acquire the communication skills required for securing employment
		CO2	Apply and analyze various concepts of writing strategies in professional communication skills like reports, resume and minutes of the meeting														
																	Retained

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CO5	Understand the organization of the passage and also analyze the tone, attitude and style of the author	2	2	2	2	To understand the methods of identifying synonyms and antonyms and analyze the meaning of a word from the context
CO4	Acquire knowledge of and apply people skills in various social, organizational and corporate ambience	2				Retained
CO1	Understand the method of identifying synonyms and antonyms and analyze the meaning of a word from the context			1		
CO2	Analyze issues and arguments in the process of critical reasoning and apply grammar rules to correct sentences			1		
CO3	Apply the concepts of basic algebra and their importance while solving the problems			1		
CO4	Apply the short cut methods on the concepts of different modals in calendars, clocks, blood relations and various types of arrangements			1		
CO1	Understand and analyze the depth of a topic and use the advanced levels in creative speaking and debating.			1		To acquire the skills which are essential to work in a corporate environment
CO2	Understand and analyze various strategies involved in writing an essay and apply various styles in writing			2		
CO3	Understand and analyze the given text critically and answer questions on critical reasoning based on the given information			3		Retained
CO4	Acquire knowledge on various employability skills & analyze a situation and develop adaptability			3		
CO5	Apply the concepts of basic geometry and their importance while solving the problems			2		
CO1	Model physical laws and relations mathematically as a first order differential equation, solve by an appropriate method and interpret the			2		To become familiar with first and second order differential equations, linear

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Algebra		solution.										equations and solve by an appropriate method and interpret the solution and Verify the solution of problems through MATLAB.			
CO2	Model physical laws and relations mathematically as a second higher order differential equation. solve by an appropriate method and interpret the solution.	2													
CO3	Obtain the Fourier series expansions of periodic functions and use the series to solve differential equations.	2													
CO4	Model physical problems mathematically as a system of linear equations and solve them by analytical and numerical methods. Also, determine the nature of Quadratic form using Eigen values	2													
CO5	Verify the solution of problems through MATLAB.									2	2				
ISME1001	Mechanics	CO1	Understand the concept of forces and apply the static equilibrium equations.	1								2		Retained	To Understand the concept of forces acting on various elements of structures.
		CO2	Analyze co-planar and non-co-planar system of forces.	2									2		
		CO3	Apply the concept of centroid & centre of gravity to determine moment of inertia.	2									2		
		CO4	Analyze the rigid bodies under translation and rotation with and without considering forces.	2									2		
		CO5	Understand the engineering systems to prepare and demonstrate the models with the help of mechanics concept to solve the engineering problems.	1									2		
ISPH1001	Engineering Materials	CO1	Understands structure of crystalline solids, kinds of crystal imperfections and appreciates structure-property relationship in crystals.	1									2	Retained	To understand the Engineering properties of Materials and to know the behaviour and to apply the same in civil engineering
		CO2	Understands the role of electronic energy band structures of solids in governing various electrical and optical properties of materials.	1									2		

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15CY1001	Engineering Chemistry		C03	Understands role of molecular vibrations in determining thermal properties of materials and deformation of materials in response to action of load, for identification of materials having specific engineering applications.	1						2	To understand the Engineering Chemistry which are essential to know the behaviour of materials and structural elements and to come up with solutions			
				C04	Understands spin and orbital motion of electrons in determining magnetic properties of materials and identifies their role in classification soft & hard magnetic materials having specific engineering applications.	1							2		
				C05	Apply the knowledge on structure and properties of materials while executing related experiments and develop some inter disciplinary projects.	2							2		
				C01	Examine water quality and select appropriate purification technique for intended problem	2			2				2		
				C02	Predict potential complications from combining various chemicals or metals in an engineering setting	2			2				2		
				C03	Discuss fundamental aspects of electrochemistry and materials science relevant to corrosion phenomena	2			2				2		
				C04	Apply phase rule, polymers, conducting polymers and nano chemistry to engineering processes	2			2				2		
				C05	An ability to analyze & generate experimental skills	2			2				2		
				C01	Understand the basis of Life, Living organisms and human body systems						1		1	2	Understand the basis of Life, Living organisms and human body systems
				C02	Understand the importance of Diet and Nutrition						1		1	2	
15BT1001	Biology for Engineers										Retained				

CO3	Acquire the knowledge of beneficial and harmful Microorganisms and Biosensors	1	1	1	2	To understand the Engineering Mathematics which are essential to know the behaviour of materials and structural elements and to come up with solutions		
ISMT1203	Multivariate Calculus	CO1	Determine extreme values for functions of several variables	2			Retained	
		CO2	Determine area, volume through multiples integrals	2				
		CO3	Apply the concepts of vector calculus to calculate the gradient, directional derivative, arc length, areas of surfaces and volume of solids in practical problems	2				
		CO4	Obtain analytical and numerical solutions of Heat and wave equations	2				
		CO5	Verify the solution of problems through MATLAB			1		2
IS CE 2103	Engineering Geology	CO1	Understand various geological processes operate on the surface of the earth, impact of the processes on the construction materials.	2	2		Retained	
		CO2	Understand the formation of different types of rocks and their identification and properties and use in sourcing suitable geological materials for construction	2				2
		CO3	Equip with factors leading to various geological hazards and able to identify areas vulnerable to sliding, come out measures to stabilize slopes and seismic vulnerability.	2	2			2
		CO4	Equip with basic knowledge required for identification of suitable site for the proposed construction project. Equip with basic knowledge of hydro geological properties of rocks, identification of potential pockets for tapping groundwater and geological	2				2

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	settings that are an favorable unsafe for construction of dams and driving the tunnels.		To understand theorems of probability and their applications in discrete probability distributions to the real world problems and Obtain the solutions of linear and non-linear programming problems using different methods	Retained	To become familiar with various programming tools. Softwares and systems available in solving of Various Complex problems related to Civil engineering
15MT2104	Probability and Optimization Techniques	<p>CO1 Demonstrate Probability, theorems of probability and their applications in discrete probability distributions to the real-world problems. 2</p> <p>CO2 Apply Continuous distributions to analyze various real-world situations and also Construct the linear and non-linear regression lines. 2</p> <p>CO3 Determine the relationship between two variables for grouped and ungrouped data using correlation coefficient and also Formulate the given industrial problems as a linear programming problem and solve it by graphical method. 2</p> <p>CO4 Obtain the solutions of linear and non-linear programming problems using different methods. 2</p> <p>CO5 Verify the solution of the problems through MATLAB/Excel. 1 2</p>	<p>2</p> <p>2</p> <p>2</p> <p>2</p> <p>2</p>	<p>2</p> <p>2</p> <p>2</p> <p>2</p> <p>2</p>	
15CS1001	C Programming and Data Structures	<p>CO1 Illustrate how problems are solved using computers and programming. 2</p> <p>CO2 Interpret & Illustrate user defined C functions and different operations on list of data. 2</p> <p>CO3 Implement Linear Data Structures and compare them. 2</p> <p>CO4 Implement Binary Trees. 2</p> <p>CO5 Apply the knowledge obtained by the course to solve real world problems. 2 2</p>	<p>2</p> <p>2</p> <p>2</p> <p>2</p> <p>2</p>	<p>2</p> <p>2</p> <p>2</p> <p>2</p> <p>2</p>	

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15ME1002	Engineering Graphics	CO1	Draft Orthographic views, projections of planes and solids manually and by using CAD software Tool (AutoCAD)							2										2	Retained	To become familiar with Drafting & projections of Orthographic views, planes and solids. Sectional views, Isometric views manually and by using AutoCAD					
		CO2	Drafting Sectional views, Isometric views, development of surfaces and perspectives views manually and by using AutoCAD									2												2			
		CO3	Project based workshop to prepare different models with the aid of workshop trades i.e., Carpentry, Tin smithy, House wiring and Fitting																					2	2		
15GN1003	Measurements	CO1	Understand and apply the fundamentals of a measurement system, characteristics, transducers and metrology using simulation and experimentation tools.																				Retained	To Understand and apply the fundamentals of a measurement systems these are essential in Civil Engineering Profession			
		CO2	Understand various electrical & computer parameters and apply different measuring techniques on various electrical parameters using simulation and experimentation tools.																						2	2	
		CO3	Understand electronic & electro-physiological parameters and apply measuring techniques on electronic parameters using simulation and experimentation tools.																							2	2
		CO4	Understand and apply different measuring techniques on civil and mechanical parameters using simulation and experimentation tools.																							2	2
15GN1004	Introduction to Engineering	CO1	Understand the basic principles of engineering design																				Retained	To understand the basic principles and systems of different domains in Engineering Designs			
		CO2	Understand and analyze the possible career options in Engineering and develop strategic plan, career targets and mechanism to achieve the same.																							2	2
		CO3	Understand the aspects of critical thinking and problem solving in engineering																							2	2

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		2	2	2	2	2	2	2	2	2	2	2				
15 CE 1201	Solid Mechanics	Apply to knowledge of critical thinking to frame real-world problems and provide basic solution approach to such problems from engineering perspective	C04	Associate with the stress-strain diagrams and the relationship between the elastic constants. estimate temperature stresses in compound bars and find the stresses in thin walled pressure vessels	2								2	To understand the Engineering properties of Materials and apply the same in analysis of Structural elements in civil engineering		
				Draw Shear force and Bending moment diagrams for statistically determinate beams	2										2	Retained
				Calculate the Bending and shear stresses and draw the distribution diagrams for various cross sections.	2										2	
				Estimate the transformation of stress in a plane and draw Mohr's circle. estimate stresses due to torsion for circular shafts and find buckling load for centric and eccentric columns	2										2	
				15 CE 2102	Mechanics of Fluids	To understand the properties of Fluids and apply the same in Fluid Flow Applications in civil engineering	C01	To understand concept of flow phenomenon and determination of fluid properties.	1	1						
To understand the mechanics pressure and its measurement.	2	2											2	2		
To get the concepts of kinematic principles and solutions for simple mathematical equations. To understand the energy principle, continuity equation of fluid in 3-dimensions	2	2											2	2		
To know various hydraulic principles of pipe flow and losses in pipe systems.	2	2											2	2		
To Understand the Dimensional analysis concept and deriving the relevant equations.														2	2	

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IS CE 2206	Construction Materials and Concrete Technology	CO1	Compare the properties of most common and advanced building materials	2												Retained	To become familiar with various important Construction materials and concepts of C.C. Mix Design		
																		2	
IS CE 2206	Construction Materials and Concrete Technology	CO2	Understand the typical and potential applications of these materials such as concrete and its mix proportioning	2						2						Retained	To become familiar with various important Construction materials and concepts of C.C. Mix Design		
		CO3	Understand the relationship between material properties and structural form	2							2							Retained	
		CO4	Understand the importance of experimental verification of material properties.	1							1							Retained	
		CO1	Understand the representation, manipulation and operations of continuous Time signals and Systems								2							Retained	To Understand the representation, manipulation and operations of continuous Time signals and Systems
		CO2	Explore the continuous Time signals in Fourier domain and illustration of sampling theorem								2							Retained	
CO3	Understand the Laplace transforms and its applications in LT Systems								2						Retained				
CO4	Analyze Discrete time signals in Fourier and Z Transform domain								2						Retained				
CO5	Apply and evaluate signals and systems concept to various applications under time domain and transform domain											3			Retained				
IS CE 2105	Surveying	CO1	Understand basic concepts of surveying	1	1											Revised	To Understand the Various Surveying Equipments and Methods used in Land surveying and alignment of Different Civil Engineering Structures		
		CO2	Understand how to operate instruments required for surveying	1						1						Revised			
		CO3	Applying the surveying equipments required based on the functionality and nature of work							2	2			2		Revised			

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		Apply field data to prepare a plan required for a given civil engineering project																
CO4		2	2	2	2	2	2	2	2	2	2	2						
15 CE 2207	Building Planning and Construction	CO1	1	1	1	1	1	1	1	1	1	1	1	2	Revised	To become familiar with various types of buildings, by laws and Drawing of Building plans and components		
		CO2	1	1	1	1	1	1	1	1	1	1	1	2				
		CO3	1	1	1	1	1	1	1	1	1	1	1	2				
		CO4	1	1	1	1	1	1	1	1	1	1	1	2				
15 CE 2208	Environmental Engineering	CO1	a											2	Retained	To understand the various Basic concepts and systems involved in water supply and waste water treatment		
			b															
			c															
				2	2	2	2	2	2	2	2	2	2	2				
15 CE 2209	Hydraulics and Hydraulic Machines	CO1	2	2	2	2	2	2	2	2	2	2	2	2	Revised	To become familiar with application of Dynamics of Fluids in civil engineering		
		CO2	2	2	2	2	2	2	2	2	2	2	2	2				

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IS CE 2210	Soil Mechanics	CO5	To understand the components, function and uses of Pelton turbine, Francis turbine and Kaplan turbine.	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	Retained	To understand the Properties and Behaviour of soils for various civil engineering applications
		CO4	To performance of hydraulic design of turbines and pumps (C.P and R.P). To know various hydraulic aspects of components function and uses of Centrifugal Pumps and Reciprocating Pumps.	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
IS CE 2210	Soil Mechanics	CO1	Understand origin, index & engineering properties of soil	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	Retained	To understand the Properties and Behaviour of soils for various civil engineering applications
		CO2	Classify the soil according to I.S. guidelines and to know the stresses in soil	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
		CO3	Analyze stresses developed at various points below the ground surface using various methods and Analyze important engineering property of soil such as permeability	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
		CO4	Analyze important engineering properties of soil such as compaction, compressibility and consolidation of soil. Analyze important engineering property of soil such as shear strength of soil	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
IS CE 3111	Foundation Engineering	CO1	Carry out geotechnical field investigation and can prepare field reports and Thoroughly understand different geotechnical investigation methodologies and can handle individually	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	Retained	To Apply knowledge of soil mechanics in Geotechnical investigation to assess the behaviour of Ground to load and stability of slopes
		CO2	Can compute stress distribution using different techniques and can carry settlement analysis in different soil types	2	2	2	2	2	2	2	2	2	2	2	2	2	2			
		CO3	Compute bearing capacity of shallow and deep foundations in laboratory and field using different methods	2	2	2	2	2	2	2	2	2	2	2	2	2	2			

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		Can analyze stability of slopes for finite and infinite in different soil conditions and methods. Carry earth pressure analysis and can design retaining walls																						
CO4		2		2		2		2		2		2		2		2		2		2				
15 CE 3112	Design of Reinforced Concrete Structures	CO1	Design RC beams subjected to bending using Working Stress Method.	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	To become familiar with basic design concepts of various Concrete structural elements		
		CO2	Explain the concept of Limit State Design and apply it to beams	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	Revised	
		CO3	Apply Limit state design for flanged sections subjected to shear, torsion and concept of bond	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	Revised
		CO4	Design one-way, two-way and continuous slabs. Design columns and isolated footings subjected to axial load. Uni-axial and bi-axial bending	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	To become familiar with basic design concepts of various Steel structural elements
		CO1	Analyse and design bolted and welded connections	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	Retained
15 CE 3113	Design of Steel Structures	CO2	Design single and compound beams as per IS code	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	Retained	
		CO3	Design simple and built-up columns as per IS code	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	Retained	
		CO4	Design column base systems as per IS code. Calculate wind forces and design roof trusses	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	To become familiar with analysis of Structural elements in civil engineering using advanced methods
		CO1	Students will be able to draw influence line diagrams for determinate structure and able to estimate maximum bending moment and absolute maximum bending moment.	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	Retained
15CE301	Advanced Structural Analysis	CO2	Students will be able to analysis cable structure and three hinged arches.	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	Retained	

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Concrete Structures		2	2	2	3	2	2	3	2	2
CO2	Select appropriate foundation system.	2	2	2	3					
CO3	Apply the design principles of retaining walls.	2	2	2	3					2
CO4	Differentiate types of rectangular water tanks and analyse as per IS code methods. select types of circular water tanks and analyse as per IS code methods	2	2	2	3					2
CO1	Understand movement of water. hydrologic cycle, rainfall measurement and analysis.	2	2	2	2			3		2
CO2	Understand the concept of runoff, the factors affecting it and some methods of estimation.	2	2	2	2			3		2
CO3	Analysis of Hydrograph, derivation of Unit hydrograph (UHG) and computation of flood hydrograph from UHG.	2	2	2	2			3		2
CO4	Understand movement of Ground Water and design of tube wells. understand irrigation terminology and computation of irrigation demands. Design of canals based on regime theory, Lacey's method, Khoshla's methods.	2	2	2	2			3		2
15 IE 3250	Term Paper				3					2
15 IE 4049	Minor Project				3					2

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		designs and analysis & failures of Structures											
15 IE 4050	Major Project									3	2	Retained	To become Familiarize with collection of Published papers, Articles and Reports, apply the knowledge gained to come up with a innovative ideas in materials, systems, designs and analysis & failures of Structures
15 IE 4048	Industrial Practice School									3	2	Retained	To gain hands on experience in an ongoing construction project and work with a interdisciplinary team
	Industrial Training (Summer Break in II/IV year)									3	2	Retained	To gain hands on experience in an ongoing construction project and work with a interdisciplinary team
15 CE 3251	Advanced Design of Steel Structures	CO1	Analyse and design a beam-column	1							2	Retained	To understand about the Analysis and design of Steel Structural Component
		CO2	Explain the need of plate girder and its design as per IS code							3	2		
		CO3	Calculate the loads on gantry girder and its design	1							2		
		CO4	Design a simple truss for wind loads and design of gable frame. Explain the concept of pre-engineered buildings and their design	1							2		
15 CE 4156	Bridge Engineering	CO1	To design slab culvert as per IRC Code	1							2	Retained	To become familiar with basic concepts, analysis and design involved in Designing of Bridges
		CO2	To design simple supported T-beam girder beam							2	2		

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COS	To design pier and abutments	2	2	2	2	2	
	To design various bridge bearing, to design bridge foundation like well foundation		2			2	
	To understand the principles of vibration regarding single degree of freedom system and multi degree of freedom system	2				2	
	To understand the seismic resistant building Architecture.	2				2	
	To determine the design lateral forces by means of codal provisions.		2			2	
	To introduce the concept of ductility and corresponding detailing. To expose the students to earthquake resistant design of masonry buildings	2				2	
	To introduce prestressing methods, principles and concepts	1				2	
	To determine losses in prestress	1				2	
	To Analyse PSC Sections both at transfer of prestress and Service load conditions		3			2	
	To design prestressed concrete beams as per IS Code. to design end block of PSC beams.		3			2	
	To Analyze Structural Components in Prefabricated Components		2			2	
	To Analyze Joints for different Structural connections			2		2	
IS CE-4157	Earthquake Resistant Design of Structures	Retained					To become familiar with basic concepts involved in designing of Structures against to earth quake
IS CE-4158	Prestressed Concrete	Revised					To become familiar with basic concepts, analysis, design and execution methods involved in Prestressed concrete structures
IS CE-4159	Prefabricated Structures	Retained					To Analyze Structural Components, Joints in Prefabricated Components

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15 CE 3252	Ground Improvement Techniques	CO3	Able to design abnormal loads using code provisions	3					2	Retained	To know the different Stabilization Techniques available for the ground improvement
		CO4	Able to analyze abnormal effects using code provisions	2					2		
		CO1	Knowledge about the different techniques of ground improvement and their suitability.	2					2		
		CO2	Understanding and design of stone columns for enhancing soil bearing capacity.			2			2		
15 CE 4160	Advanced Foundation Engineering	CO3	Knowledge of the groups, their types, properties and application.	2					2	Retained	To Apply knowledge of soil mechanics in Geotechnical investigation to assess the behaviour of Ground to load and Design of Footings
		CO4	Introduction to geo synthetics, their types, function and application. Ability to design and analyse the earth-reinforcements with their connections				2		2		
		CO1	Knowledge about the different techniques for laying foundations in expansive soils.	3					2		
		CO2	Understanding and design of different types of footings.			2			2		
15 CE 4161	Geotechnical Earthquake Engineering	CO3	Various factors to be considered in foundation design.				2		2	Retained	To become familiar with understanding of ground motion due to seismic waves, seismic hazards and soil structure
		CO4	Understanding the design criteria of Machine foundations. Understanding the design criteria of Mat and For designing and construction of foundations for reciprocating machines as per IS.				2		2		
		CO1	Knowledge of the seismic phenomenon, its occurrence, tectonic theories, seismic waves and their motion in different media and measurement of ground motions.	3					2	Retained	

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CO2	Analysis skills of 1-D ground responses using linear and non-linear approaches.																				
CO3	Ability to analyze the seismic hazard through deterministic and probabilistic approaches.																				
CO4	Ability of modifying the actual ground motion records and their time and frequency domain generation. Knowledge of dynamic soil properties and their measurements using field and laboratory tests. Knowledge of the liquefaction phenomenon and its effects and the remedial measures to be taken for soil improvement.						3														
CO1	Knowledge about the different techniques of earth retaining structures and their suitability.							3													
CO2	Understanding and design of retaining walls, braced cuts and sheet piles.												2								
CO3	Knowledge of the grouts, their types, properties and application.																				
CO4	Introduction to reinforced earth and geosynthetics, their types, function and application. Ability to design and analyse the earth-reinforcements and coffer dams with their functions.												2								
CO1	Understand about Geosynthetics and Reinforced Soil retaining wall and Identifying suitable testing methods for Geosynthetics																				
CO2	Able to understand the stability of slopes and application of geosynthetics in foundations																				
CO3	Able to understand the application of geosynthetics in pavement and the use in construction of landfills																				

Design of Earth Retaining Structures

15 CE 4162

Geosynthetic s and Reinforced Soil Structures

15 CE 4163

To understand the basic concepts involved in designing of Earth Retaining Structures

Retained

To Understand about Geosynthetics and Reinforced Soil retaining wall and Identifying suitable testing methods for Geosynthetics

Retained

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		CO4	Able to identify different land filling techniques								2				22						
IS CE 3253	Design of Hydraulics Structures	CO1	To Design vertical drop weir on foundations	1											2	Retained	To understand the Design of vertical drop weir on foundations				
		CO2	To Design vertical drop weir on a canal regulator, irrigation canal, direct sluice and surplus weir of tank															2			
		CO3	To design Profile of a Ogee spillway																2		
		CO4	To design Profile of a Cross Drainage works.																2		
		CO1	Understand stream flow and its measurements	1															2	Retained	To Understand stream flow and its measurements
CO2	Understand the classification of the rivers and design of cross drainage works															2					
CO3	Understand the reservoir planning and classification of dams															2					
CO4	Able to design gravity and earth dams															2					
IS CE 4165	Environmental Impact Assessment	CO1	Understand the basic concept of environmental impact assessment, types of environmental impacts, significances and criteria for selection															2	Retained		
		CO2	Select methodology for identification of environmental impact.																	2	
		CO3	Apply the knowledge of predicting impact of proposed project on air & water																	2	

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		Acquire knowledge of predicting impact of proposed project on Noise, Soil, Biological and Socio-economic conditions. Acquire the skills of preparing environment management plans.										2	2	2	To Understand types, sources of solid waste, composition and their Properties.				
15 CE-4166	Solid Waste Management and Landfills	CO4	CO1	Understand types, sources of solid waste, composition and their Properties.	2						2			2				Revised	
			CO2	Understand the present scenario, challenges of solid waste management and various waste disposal options available.				2											
			CO3	Understand methods of solid waste disposal methods of land filling, systems adopted for conversion of solid waste and recovery of materials and energy from solid waste.				2											
			CO4	Understand the components of hazardous waste types, composition, properties and acquire skills of designing of various lining system for landfill and treatment as per MoEF and CPCB				2											
			CO1	Understand the basic concepts of Stream Sanitation & design of Stabilization ponds	2														
15 CE-4167	Advanced Environmental Engineering	CO2	CO1	Acquire the knowledge of industrial wastewater treatment process								2						Retained	
			CO3	Acquire the knowledge on new concepts in biological waste treatment									2						
			CO4	Analyze air pollution and plume behavior, measuring of noise pollution, understand various aspects related to Solid & Hazardous waste management										2					
			CO1	Understand about the Alignment, Geometrics, Analyze and Design of Hill Roads	3														
15 CE-3254	Advanced Highway Engineering																2	Retained	To become familiar with Design concepts of highways and associated infrastructure

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		Know the Importance of Low Volume roads in Indian scenario & Analyze and design Low Volume Roads including quality control aspects										2										To understand the basic concepts in involved in traffic engineering and relevant safety systems adopted in traffic management													
		Know the Importance of Desert Roads and Guidelines for Design										2										Retained													
		Know the Importance of Roads in Swampy, water-logged areas and in Black Cotton Soil. Versatile with various components of Special Roads such as Expressways, Toll Roads, Urban Roads.										2										Retained													
CO2		Apply the Concepts of Probability in Traffic Engineering										2																							
CO3		Know the Fundamental design concepts of Interchanges, Parking Facilities, Freeways										2																							
CO4		Design Traffic Facilities include Un signalized Intersections (Rotary), Signalized Intersection (signal design)										2																							
CO1		Know the Accident Situation in India, road safety measures. Understand Detrimental Effects of traffic on the environment										2																							
CO2		Characterize pavement materials and carry the advance tests on bituminous mixtures										2																							
CO3		Thorough with stresses and strains of flexible and rigid pavements.										2																							
CO4		Thorough with analysis and design of flexible highway and airport pavements										2																							
CO1		Thorough with analysis and design of rigid highway and airport pavements										2																							
IS CE 4168		Traffic Engineering																																	
IS CE 4169		Advanced Pavement Design Engineering																																	

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To become familiar with various systems involved in urban transportation

To learn the concept of travel demand and supply and modes available for transportation

15 CE 4170	Urban Transport Systems Planning	15 CE 4170																
		CO1	CO2	CO3	CO4	CO1	CO2	CO3	CO4	CO1	CO2	CO3	CO4					
			2										2					Retained
				2									2					Retained
					2								2					Retained
						2							2					Retained
15 CE 4171	Railway, Airport and Dock & Harbour Engineering	CO1				1							2					To know the basic components and systems involved in Railway, Airport and Dock & Harbour Engineering
		CO2				1							2					Retained
		CO3											2	2				
		CO4												2				
15 CE 4174	Green Buildings	CO1				2												To Understand the Requirements for Green Buildings & methods of rating
		CO2												2				
		CO3													2			Revised
		CO4														2		

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15 CE 30A2	Environmental Pollution Control Methods	CO 1	To identify the sources of Air pollution, effects and control methods.	2											2	Retained	To identify the sources of Air pollution, effects and control methods.	
		CO 2	To identify the sources of water pollution, effects and control methods.				2											2
		CO 3	To identify the sources of solid waste and disposal methods.			2												2
		CO 4	To identify the sources of noise pollution, effects and control methods.			2												2
15 CE 30A3	Solid and Hazardous Waste Management	CO 1	Understand the importance types, sources and disposal methods of Solid waste Management.												2	Retained	To Understand the importance types, sources and disposal methods of Solid waste Management.	
		CO 2	To understand the importance of conversion and recycling of waste.			2												2
		CO 3	Understand the types and Sources of Hazardous waste												2			2
		CO 4	Understand the disposal methods of Hazardous waste												2			2
15 CE 30A4	Remote Sensing and GIS	CO 1	To get the Knowledge of Remote sensing Technology.												2	Retained	To understand the basic concepts of remote sensing and image processing its application in engineering domain and identifying solutions to the problems of the society	
		CO 2	Strong base of knowledge to Integrate the Remote sensing and GIS			2												2
		CO 3	Design of Geospatial Information systems using RS												2			2
		CO 4	Design of Geospatial Information systems using GIS in solving societal problems												2			2

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		Define and describe types of disasters, related hazards and the causes for disasters				To understand the impact of various natural and manmade disasters on the society and environment and measures that can be taken to minimize the losses to property and life						
15 CE 30A5	Disaster Management	CO 1	2	2	2	2	2	2	2	Retained		
		CO 2	2								2	
		CO 3	2								2	
		CO 4	2								2	
15 EM 30B2	E-Commerce	CO 1	2						2	Retained		
		CO 2				1					2	
		CO 3							2		2	
		CO 4	1								2	
15 ME 30B6	Operations Research	CO 1	2							Retained		
		CO 2	2								2	
		CO 3						2				2
		CO 4							2			2

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15 PLE0B7		Nano Materials and Technology	Understand the essentials of nanomaterials and nanotechnology along with various methods used to fabricate nanomaterials. Also, recognize the several techniques used to characterize nanomaterials	1								1							2	Retained	To Understand the essentials of nanomaterials and nanotechnology along with various methods used to fabricate nanomaterials. Also, recognize the several techniques used to characterize nanomaterials	
15 GN 30C1		Self-Development	CO 1 Understand the mechanical, optical & electrical properties of nanomaterials and also understand the concepts and applications of carbon-based nanomaterials CO 2 Understand the subsea engineering, field development, distributions system used in subsea. CO 3 Apply the surveying to the subsea, understand the control system in subsea, understand the effect of corrosion and scale on the subsea equipment CO 4 Illustrate and realign values based on goal. CO1 Demonstrate various types of Yoga and identify commonalities of different religions. CO2 Illustrate practices of different Schools of Meditation and self-motivated approach to pursue a balanced life CO3 Demonstrate techniques of stress management and Self-management focused interest in a Spiritual Practice	1																		To Understand various types of Yoga and identify commonalities of different religions.
15 GN 30C2		Indian Culture and History	CO1 Understand the basic features of Indian Culture and early civilizations of Indian History, up to Religious Movements CO2 Gain basic knowledge in the major socio-political concepts of important kingdoms from Mauryas to Mughals.									1									To Understand the basic features of Indian Culture and early civilizations of Indian History, up to Religious Movements	

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Gain Knowledge in the aspects of Modern India and Indian National Movement up to		1	2				
15.MB.3051	Paradigms in Management Thought	CO4	Acquire Knowledge in the area of Final Phase of Indian National Movement and partition of India	1	2	To Understand the basic management concepts along with an insight into levels of management	
		CO1	Understand the basic management concepts along with an insight into levels of management.	2	2		Retained
		CO2	Understand the key contributions of classical approach to Management	2	2		
		CO3	Understand and apply Quantitative methods to improve Management performance.	2	2		
15.MB.3052	Indian Economy	CO4	Understand the key contributions of Behavioral and contemporary approaches to Management.	2	2	To understand the concept on various types of economic systems and their functioning, circular flow of economic activity, also the nature and features of Indian economy.	
		CO1	Understand the structure of Indian Economy	2	2		Retained
		CO2	Understand the role of the Indian Economy in the global context.	2	2		
		CO3	Develop a perspective on the different problems and approaches to economic planning and development in India	2	2		
15.MB.3053	Managing Personal Finances	CO1	Understand the need for effective financial planning	2	2	To Understand the need for effective financial planning and tax planning strategies	
		CO2	Analyze the basic concepts of money management, tax planning, consumer credit, housing and other consumer decisions, insurance, investments, retirement planning etc.	2	2		Retained



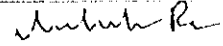

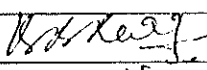

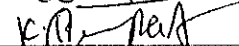
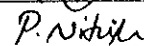
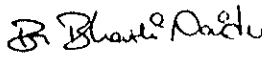
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		Evaluate various financial tax saving schemes to save money to get tax benefits.											
CO3		Design savings and investment plans.											
CO4		Understand the concepts of marketing factors influencing the consumer behavior, decision making process and strategic areas of JPs											
CO1		Analyze the markets and consumers.											
CO2		Create an appropriate strategy for the marketing of high tech products and services.											
CO3													
15MB3054	Basics of Marketing for Engineers												To Understand the concepts of marketing factors influencing the consumer behavior, decision making process

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K L University
Department of Civil Engineering
Department Academic Committee (DAC)

The following members attended the meeting on 31st October 2015 at 9.30 A.M:

S.No.	Name	Designation of the person	Signature
1	Dr. K. Ramesh	Professor & HOD	
2	Dr. C. Ravi Kumar Reddy	Professor	
3	Mr. B. G. Rahul	Assistant Professor	
4	Mr. S. Kanakambara Rao	Associate Professor	
5	Mr. P. Sundara Kumar	Associate Professor	
6	Dr. A. Siva Sankar	Associate Professor	
7	Dr. K. Rajasekhara Reddy	Associate Professor	
9	Mr. K. Shyam Chamberlin	Assistant Professor	
10	Mr. K. Hemantha Raja	Assistant Professor	
11	P. Nitish (120020007)	IV/IV B. Tech Student	
12	B. Bharathi Naidu (120020033)	IV/IV B. Tech Student	

K L UNIVERSITY
DEPARTMENT OF CIVIL ENGINEERING
MINUTES OF DEPARTMENT ACADEMIC COMMITTEE MEETING

Meeting Particulars

Type of Meeting	INTERNAL ACADEMIC DISCUSSIONS
Department conducting the meeting	CIVIL ENGINEERING
Date of the meeting	11-02-16
Time of the meeting	9.30 A.M.
Venue of the meeting	HoD Chamber (Civil)

The following members were present:

S.No.	Name	Designation of the person	Position of the person in the meeting
1	Dr. C. Ravi Kumar Reddy	Professor & HOD	Chairman
2	Dr. K. Ramesh	Professor	Member
3	Mr. B. G. Rahul	Assistant Professor	Convener
4	Mr. S. Kanakambara Rao	Associate Professor	Member
5	Mr. P. Sundara Kumar	Associate Professor	Member
6	Dr. A. Siva Sankar	Associate Professor	Member
7	Dr. K. Rajasekhara Reddy	Associate Professor	Member
9	Mr. K. Shyam Chamberlin	Assistant Professor	Member
10	Mr. K. Hemantha Raja	Assistant Professor	Member
11	P. Nitish (120020007)	IV/IV B. Tech Student	Member
12	B. Bharathi Naidu (120020033)	IV/IV B. Tech Student	Member

Agenda:

1. To discuss the feedbacks received from stake holders on curriculum
2. To propose the curriculum for B. Tech 2016-17 admitting batch
3. Any other points with the permission of the DAC chairman

The following points were discussed and resolved:

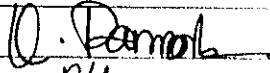

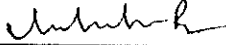


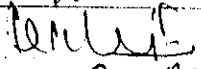
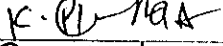


1. Upon discussing the feedback from academic peers, the committee resolved to recommend the following to BOS.

- a. Syllabus of Building Planning and Construction is reviewed & revised, and contents added is given in Annexure-1.
- b. Syllabus of all the professional elective courses have been reviewed and noticed that, prestressed concrete course required revision. Accordingly, the syllabus is revised and contents and added is given in Annexure-1.
2. The DAC members discussed and resolved to adopt innovative teaching pedagogies such as showing the relevant animations and quoting the live examples of construction activities going on in the campus.
3. The DAC members discussed and resolved to improve the quality of major, minor project work, term paper and practice school.
4. The DAC members discussed and resolved to prepare all the tutorial sheets in advance for courses having tutorial component.

Dr. C. Ravi Kumar Reddy
(Head of the Department)

K L University
Department of Civil Engineering
Department Academic Committee (DAC)

The following members attended the meeting on 11th February 2016 at 9:30 A.M.:

S.No.	Name	Designation of the person	Signature
1	Dr. C. Ravi Kumar Reddy	Professor & HoD	
2	Dr. K. Ramesh	Professor	
3	Mr. B. G. Rahul	Assistant Professor	
4	Mr. S. Kanakambara Rao	Associate Professor	
5	Mr. P. Sundara Kumar	Associate Professor	
6	Dr. A. Siva Sankar	Associate Professor	
7	Dr. K. Rajasekhara Reddy	Associate Professor	
9	Mr. K. Shyam Chamberlin	Assistant Professor,	
10	Mr. K. Hemantha Raja	Assistant Professor	
11	P. Nitish (120020007)	IV/IV B. Tech Student	
12	B. Bharathi Naidu (120020033)	IV/IV B. Tech Student	

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Department of Civil Engineering

Department Academic Committee Meeting (31/10/2015 & 11/02/2016)

Annexure I: Proposed B.Tech 2016-17 Course Structure

S.No	Course Name	L-T-P	Cr	Pre-Req.	Remarks
I	HUMANITIES AND SOCIAL SCIENCES(HS)				
	Rudiments of communication skills	0-0-4	2	NIL	Contents Removed
	Interpersonal Communication skills	0-0-4	2	NIL	NIL
	Professional communication skills	0-0-4	2	NIL	NIL
	Employability Skills	0-0-4	2	NIL	NIL
	Verbal and quantitative reasoning	0-0-4	2	NIL	NIL
	Corporate communication skills	0-0-4	2	NIL	NIL
	Ecology and Environment	2-0-0	2	NIL	NIL
	Human Values	2-0-0	2	NIL	NIL
II	BASIC SCIENCES(BS)				
	Single variable calculus and matrix algebra	02-02-2	4	NIL	NIL
	Mechanics	02-02-2	4	NIL	NIL
	Engineering materials	02-02-2	4	NIL	NIL
	Engineering Chemistry	02-02-2	4	NIL	NIL
	Biology for engineers	2-0-0	2	NIL	NIL
	Multivariate calculus	02-02-02	4	NIL	NIL
	Engineering geology	3-0-2	4	NIL	NIL
	Probability and optimization techniques	02-02-2	4	NIL	NIL
III	Engineering Sciences (ES)				
	C programming & data structures	02-04-2	5	NIL	Contents Added
	Engineering graphics	0-0-6	3	NIL	NIL
	Thermodynamics	02-02-2	4	NIL	NIL
	Measurements	0-0-4	2	NIL	NIL
	Introduction to engineering	2-0-2	3	NIL	NIL
	Solid mechanics	3-0-2	4	Engineering materials	NIL
	Object oriented programming	02-02-02	4	NIL	NIL
	Mechanics of fluids	02-02-2	4	Engineering materials	NIL
	Construction materials & concrete technology	3-0-2	4	NIL	NIL
IV	Professional Core (PC)				
	Structural Analysis	02-02-2	4	Solid mechanics	NIL
	Surveying	3-0-2	4	NIL	Contents Added
	Building Planning and Construction	3-0-2	4	NIL	Contents Added
	Environmental Engineering	3-0-2	4	NIL	NIL
	Hydraulics and Hydraulic Machines	3-0-2	4	Mechanics of fluids	Contents Removed
	Soil Mechanics	3-0-2	4	NIL	NIL
	Foundation Engineering	02-02-2	4	Soil Mechanics	NIL
	Design of Reinforced Concrete Structures	3-0-2	4	Structural Analysis	Contents Added
	Design of Steel Structures	02-02-2	4	NIL	NIL
	Advanced Structural Analysis	3-0-2	4	Structural Analysis	NIL
	Transportation Engineering	3-0-2	4	NIL	NIL
	Quantity Surveying and Estimation	3-0-2	4	NIL	NIL
	Advanced Design of Reinforced Concrete Structures	3-0-2	4	Design of Reinforced Concrete Structures	NIL
	Water Resources Engineering	02-02-2	4	NIL	NIL
V	PROFESSIONAL ELECTIVES(PE)				

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I	STRUCTURAL ENGINEERING STREAM				
	Advanced Design of Steel Structures	3-0-0	3	Design of Steel Structures	NIL
	Bridge Engineering	3-0-0	3	NIL	NIL
	Earthquake Resistant Design of Structures	3-0-0	3	NIL	NIL
	Prestressed Concrete	3-0-0	3	NIL	Contents Added
	Prefabricated Structures	3-0-0	3	NIL	NIL
II	GEOTECHNICAL ENGINEERING STREAM				
	Ground Improvement Techniques	3-0-0	3	NIL	NIL
	Advanced Foundation Engineering	3-0-0	3	NIL	NIL
	Geotechnical Earthquake Engineering	3-0-0	3	NIL	NIL
	Design of Earth Retaining Structures	3-0-0	3	NIL	NIL
	Rock Mechanics	3-0-0	3	NIL	NIL
III	ENVIRONMENTAL AND WATER RESOURCES				
	Advanced Open Channel Hydraulics	3-0-0	3	NIL	NIL
	Design of Hydraulic Structures	3-0-0	3	NIL	NIL
	Environmental Impact Assessment	3-0-0	3	NIL	NIL
	Solid Waste Management and Landfills	3-0-0	3	NIL	Syllabus Removed
	Rural Water Supply & Sanitation	3-0-0	3	NIL	NIL
IV	TRANSPORTATION ENGINEERING STREAM				
	Advanced Highway Engineering	3-0-0	3	NIL	NIL
	Traffic Engineering	3-0-0	3	NIL	NIL
	Advanced Pavement Design Engineering	3-0-0	3	NIL	NIL
	Urban Transport Systems Planning	3-0-0	3	NIL	NIL
	Railways, Docks, Harbors and airports	3-0-0	3	NIL	NIL
V	GENERAL STREAM				
	Modern Construction Materials	3-0-0	3	NIL	NIL
	Advanced Concrete technology	3-0-0	3	NIL	NIL
	Advanced Surveying	3-0-0	3	NIL	NIL
	Green Buildings	3-0-0	3	NIL	Contents Removed
	Construction Management	3-0-0	3	NIL	
OPEN ELECTIVES					
	Open Elective - I	3-0-0	3	NIL	NIL
	Open Elective II	3-0-0	3	NIL	NIL
	Open Elective III	3-0-0	3	NIL	NIL
	Open Elective IV	3-0-0	3	NIL	NIL
	Open Elective - V	3-0-0	3	NIL	NIL
VII	PROJECT				
	Term Paper	0-0-4	2	NIL	
	Practice School	0-0-16	8	NIL	NIL
	Minor Project	0-0-4	2	NIL	NIL
	Major Project	0-0-16	8	NIL	NIL
	Employability Skills	1-0-2	0	NIL	NIL
	Advanced Employability Skills	1-0-2	0	Employability Skills	NIL
	Sports, Games, Yoga	0-0-2	0	NIL	NIL
	NCC, NSS, NSO, CEA	0-0-2	0	NIL	NIL
	Quantitative Aptitude and Reasoning	0-0-2	0	NIL	NIL

Ch. by

1.1.2 Percentage of programmes where syllabus revision was carried out during the last five years

2016-17				
Program Code of revised syllabus	Program name of revised syllabus	No. of Courses offered during this academic year	Number of Courses Revised	Percentage of syllabus content added or replaced
002	B. Tech (Civil Engineering)	48	8	18

List of Syllabus Revised Courses for A.Y. 2016-17

S. No	Course Code	Course Name	L-T-P	Cr.	Removed	Added
1	15EN1101	Rudiments of Communication Skills	0-0-4	2	Contents Removed	--
2	15CS1001	C Programming & Data Structures	2-4-2	5	--	Contents Added
3	15CE2207	Building Planning and Construction	3-0-2	4	--	Contents Added
4	15CE2105	Surveying	3-0-2	4	--	Contents Added
5	15CE4158	Prestressed Concrete	3-0-0	3	--	Contents Added
6	15CE3112	Design of Concrete Structures	3-0-2	4	--	Contents Added
7	15CE2209	Hydraulics and Hydraulic Machines	3-0-2	4	Contents Removed	--
8	15CE4174	Green Buildings	3-0-0	3	Contents Removed	--

Ch. Wj

RUDIMENTS OF COMMUNICATION SKILLS

Course code: 15 EN 1101

(L T P): 0-0-4

Pre Requisite: NIL

Credits: 2

Syllabus:

Speaking & listening skills - Vowels in English, Diphthongs, Consonants, Word stress, Intonation, Words in Groups - English Conversation Practice, Difference between British English and American English, Received Pronunciation and Dialects, American Spelling and American Grammar, American Pronunciation, Listen and respond, Speak and Listen, Listen and Speak.

Speaking and listening exercises from Effective Speech Richard W Clark- Speaking to persuade, listening to understand.

General writing skills - Paragraph Writing: Seven 'C's of writing, Identifying & writing Topic sentences, Linkers, Coordinates, Sequencing, Letter Writing: Formal & Informal formats- Full block, Semi block, Modified block- Types & tone of letters, content & brevity, Note Making & Note Faking.

Reading skills - Reading comprehension Practice exercises (TOEFL Level) - Reading for information, reading for specifics - Theme, Attitude, Identifying tone.

Soft skills - Introduction to soft skills, Body Language, Postures, Gestures, Eye contact, Personality styles, Grooming, Dress code, Group discussion - Format, Do's and Don'ts, scoring method

Text book:

1. Material produced by the Dept.

References Book:

1. Mark Hancock and Sylvie Donna, "English pronunciation in use: Intermediate", 2nd edition, Cambridge publication.
2. Krishna Mohan & N P Singh, "Speaking English Effective (English) 2nd Edition", Laxmi Publications-New Delhi, (2005).
3. Mr. Gopaldaswamy Ramesh et al, "The Ace of Soft Skills", Pearson publishers, (2010).
4. Richard W.Clark, "Effective speech", Glencoe Pub. Co., (1988).



RUDIMENTS OF COMMUNICATION SKILLS

Course code: 15 EN 1101

(L T P): 0-0-4

Pre Requisite: NIL

Credits: 2

Syllabus:

Speaking & listening skills - Vowels in English, Diphthongs, Consonants, Word stress, Intonation, Words in Groups - English Conversation Practice, Difference between British English and American English, Received Pronunciation and Dialects, American Spelling and American Grammar, American Pronunciation, Listen and respond, Speak and Listen, Listen and Speak.

Speaking and listening exercises from Effective Speech Richard W Clark- Speaking to persuade, listening to understand.

General writing skills - Paragraph Writing: Seven 'C's of writing, Identifying & writing Topic sentences, Linkers, Coordinates, Sequencing, Letter Writing: Formal & Informal formats- Full block, Semi block, Modified block- Types & tone of letters, content & brevity, Note Making & Note Taking.

Reading skills - Reading comprehension Practice exercises (TOEFL Level) - Reading for information, reading for specifics - Theme, Attitude, Identifying tone.

Soft skills - Introduction to soft skills, Body Language, Postures, Gestures, Eye contact, Personality styles, Grooming, Dress code, Group discussion - Format, Do's and Don'ts, scoring method

Text book:

1. Material produced by the Dept.

References Book:

1. Mark Hancock and Sylvie Donna, "English pronunciation in use: Intermediate", 2nd edition, Cambridge publication.
2. Krishna Mohan & N P Singh, "Speaking English Effective (English) 2nd Edition", Laxmi Publications-New Delhi, (2005).
3. Mr. Gopaldaswamy Ramesh et al, "The Ace of Soft Skills", Pearson publishers, (2010).
4. Richard W.Clark, "Effective speech", Glencoe Pub. Co., (1988).



C PROGRAMMING & DATA STRUCTURES

COURSE CODE : 15 CS 1001

(L T P): 2-4-2

PRE REQUISITE : NIL

CREDITS : 4

Algorithm Analysis: Mathematical Background, Model, Analyze, Running Time Calculations, Lists, **Stacks and Queues:** Abstract Data Types (ADTs), The List ADT, vector and list in the STL, Implementation of vector, Implementation of list, The Stack ADT, The Queue ADT, **Trees:** Preliminaries, Binary Trees, The Search Tree ADT—Binary Search Trees, AVL Trees, Splay Trees, Tree Traversals (Revisited), B-Trees, Red black trees **Hashing:** General Idea, Hash Function, Separate Chaining, Hash Tables without Linked Lists, Rehashing, Hash Tables in the Standard Library, Extendible Hashing, **Priority Queues (Heaps):** Model, Simple Implementations, Binary Heap, Applications of Priority Queues, **Sorting:** Preliminaries, Insertion Sort, A Lower Bound for Simple Sorting Algorithms, Shell sort, Heap sort, Merge sort, Quick sort, Indirect Sorting, A General Lower Bound for Sorting, Bucket Sort, External Sorting.

TEXT BOOKS:

1. Mark Allen Weiss, Data Structures and Algorithm Analysis in C, 2008, Third Edition, Pearson Education.

REFERENCE BOOKS:

1. Pearson Education, First Edition by A. V. Aho, J. E. Hopcroft, And J. D. Ullman, Data Structures and Algorithms" Reprint 2003.
2. Second Edition, by R. F. Gilberg, B. A. Forouzan, Data Structures", Thomson India Edition, 2005
3. Jean-Paul Tremblay, Paul g. Sorenson, An Introduction to Data Structures with Applications Tata Mc Graw hill Edition – Second Edition.
4. by Seymour Lipschutz- Theory and Problems of Data Structures Mc Graw hill Edition
5. C by Robert Kruse, C.L. Tondo, Bruce Leung, Data Structures & Program Design in Shashi Mogalla.
6. Michael T. Goodrich, Data Structures and Algorithms in C++ Roberto Tamassia, David Mount.
7. Yedidyah Langsam, Moshe J. Augenstein, Data Structures using C & C++ by Aaron M. Tenenbaum.

Carly

C PROGRAMMING & DATA STRUCTURES

COURSE CODE : 15 CS 1001

(L T P): 2-4-2

PRE REQUISITE : NIL

CREDITS : 4

Algorithm Analysis: Mathematical Background, Model, Analyze, Running Time Calculations, Lists, **Stacks and Queues:** Abstract Data Types (ADTs), The List ADT, vector and list in the STL, Implementation of vector, Implementation of list, The Stack ADT, The Queue ADT, **Trees:** Preliminaries, Binary Trees, The Search Tree ADT—Binary Search Trees, AVL Trees, Splay Trees, Tree Traversals (Revisited), B-Trees, Red black trees **Hashing:** General Idea, Hash Function, Separate Chaining, Hash Tables without Linked Lists, Rehashing, Hash Tables in the Standard Library, Extendible Hashing, **Priority Queues (Heaps):** Model, Simple Implementations, Binary Heap, Applications of Priority Queues, **Sorting:** Preliminaries, Insertion Sort, A Lower Bound for Simple Sorting Algorithms, Shell sort, Heap sort, Merge sort, Quick sort, Indirect Sorting, A General Lower Bound for Sorting, Bucket Sort, External Sorting.

~~Graph Algorithms, Shortest Path Algorithms, Minimum Spanning Trees~~

TEXT BOOKS:

1. Mark Allen Weiss, Data Structures and Algorithm Analysis in C, 2008, Third Edition, Pearson Education.

REFERENCE BOOKS:

1. "Data Structures and Algorithms" Reprint 2003, Pearson Education, First Edition by A. V. Aho, J. E. Hopcroft, And J. D. Ullman, Data Structures and Algorithms" Reprint 2003.
2. "Second Edition, by R. F. Gilberg, B. A. Forouzan, Data Structures", Thomson India Edition, 2005
3. Jean-Paul Tremblay, Paul g. Sorenson, An Introduction to Data Structures with Applications Tata Mc Graw hill Edition – Second Edition.
4. by Seymour Lipschutz- Theory and Problems of Data Structures Mc Graw hill Edition
5. C by Robert Kruse, C.L. Tondo, Bruce Leung, Data Structures & Program Design in Shashi Mogalla.
6. Michael T. Goodrich, Data Structures and Algorithms in C++ Roberto Tamassia, David Mount.
7. Yedidyah Langsam, Moshe J. Augenstein, Data Structures using C & C++ by Aaron M. Tenenbaum.

CS. W

Building Planning and Construction

Course code : 15 CE 2207
Pre Requisite : Nil

(L T P) : 3-0-2
Credits : 4

Syllabus:

Building Planning: Introduction to Buildings, Classification of Buildings, National Building Code Building Planning: Selection of Site, Orientation, Ventilation, Furniture requirements, Roominess, Sanitation, Lighting, Space for equipment for air-conditioning, Space for machinery etc.; Aspect and prospect, Privacy, Elegance and economy; Climatic considerations; Materials selection, Wall thickness and Scales.

Building Bye-Laws & Regulations: Objectives of Building Bye-Laws, Building regulations; Calculation of Plinth Area (PA), floor area and carpet area; Floor Area Ratio (FAR), Floor Space Index (FSI), Height of Buildings as per local code book.

Masonry: Masonry, Stone Masonry, Rubble and Ashlar Masonry, Brick Masonry, Bond, Types of bonds, English and Flemish bond, Composite masonry, Stone masonry, Concrete Masonry, Reinforced masonry, Types of walls, Types of Partition walls.

Floors and roofs: Floors, Types of floor, Details of concrete and Terrazzo floors, Roofs, Types of Roofs, Flat roofs, Sloping roofs, Shell Roofs, Roof coverings, AC sheets, GI sheets, Lintels, Classification of lintels, Arches, Classification of arches, Types of weathering courses, Damp proofing, Methods of damp proofing.

Stairs and supporting structure: Staircase, Types of staircase, Types of doors and windows, Wooden and metallic door frames, Ventilators, Fixtures and fastening for doors and windows, Shoring, Types, Underpinning, Types, Scaffolding, Components, Types, Form work, Form work for columns, beam, stairs, walls.

Building amenities: Thermal insulation, Heat transference, Insulating material, Method of application, Ventilation, Requirements, Types of ventilation, Air conditioning, Fire proof.

Text Books:

1. Dr. N. Kumara Swamy, A. Kameswara Rao, building planning and drawing Charotar Publishing House, 7th Edition, 2013.
2. P C Varghese, Building construction Prentice hall of India (P) Ltd, New Delhi, 2007.

Reference Books:

1. MG Shah, Building Drawing Tata McGraw-Hill, New Delhi, 2006.
2. B. C Punmia, Building construction Laxmi Publications, New Delhi.



BUILDING PLANNING AND CONSTRUCTION

Course code : 15 CE 2207

Pre Requisite : NIL

(L T P) : 3-0-2

Credits : 4

Syllabus:

Building Planning: Introduction to Buildings, Classification of Buildings, National Building Code Building Planning: Selection of Site, Orientation, Ventilation, Furniture requirements, Roominess, Sanitation, Lighting, Space for equipment for air-conditioning, Space for machinery etc.; Aspect and prospect, Privacy, Elegance and economy; Climatic considerations; Materials selection, Wall thickness and Seales.

Building Bye-Laws & Regulations: Objectives of Building Bye-Laws, Building regulations; Calculation of Plinth Area (PA), floor area and carpet area; Floor Area Ratio (FAR), Floor Space Index (FSI), Height of Buildings as per local code book.

Masonry: Masonry, Stone Masonry, Rubble and Ashlar Masonry, Brick Masonry, Bond, Types of bonds, English and Flemish bond, Composite masonry, Stone masonry, Concrete Masonry, Reinforced masonry, Types of walls, Types of Partition walls.

Floors and roofs: Floors, Types of floor, Details of concrete and Terrazzo floors, Roofs, Types of Roofs, Flat roofs, Sloping roofs, Shell Roofs, Roof coverings, AC sheets, GI sheets, Lintels, Classification of lintels, Arches, Classification of arches, Types of weathering courses, Damp proofing, Methods of damp proofing.

Stairs and supporting structure: Staircase, Types of staircase, Types of doors and windows, Wooden and metallic door frames, Ventilators, Fixtures and fastening for doors and windows, Shoring, Types, Underpinning, Types, Scaffolding, Components, Types, Form work, Form work for columns, beam, stairs, walls.

Building amenities: Thermal insulation, Heat transference, Insulating material, Method of application, Ventilation, Requirements, Types of ventilation, Air conditioning, Fire proof

Construction methods, materials and methods

Text Books:

1. Dr. N. Kumara Swamy, A. Kameswara Rao, building planning and drawing Charotar Publishing House, 7th Edition, 2013.

2. P C Varghese, Building construction Prentice hall of India (P) Ltd, New Delhi, 2007.

Reference Books:

1. MG Shah, Building Drawing Tata McGraw-Hill, New Delhi, 2006.

2. B. C Punmia, Building construction Laxmi Publications, New Delhi.

SURVEYING

Course code : 15 CE 2105
Pre Requisite : NIL

(L T P) : 3-0-2
Credits : 4

Syllabus:

Surveying Introduction - Overview of plane surveying (chain, compass and plane table). Objectives, Principles and classifications.

Distances and Direction - Distance measurement conventions and methods; use of chain and tape. Electronic distance measurements, Meridians, Azimuths and Bearings, declination, computation of angle.

Leveling and Contouring - Concept and Terminology, Temporary and permanent adjustments- method of leveling. Characteristics and Uses of contours- methods of conducting contour surveys and their plotting.

Computation of Areas and Volumes - Area from field notes, computation of areas along irregular boundaries and area consisting of regular boundaries. Embankments and cutting for a level section and two level sections with and without transverse slopes, determination of the capacity of reservoir, volume of barrow pits.

Theodolite - Theodolite, description, uses and adjustments - temporary and permanent, measurement of horizontal and vertical angles. Principles of Electronic Theodolite, Trigonometrical leveling, Traversing.

Tachometric Surveying - Stadia and tangential methods of Tacheometry. Distance and Elevation formulae for Staff vertical position.

Curves - Types of curves, design and setting out simple curves. Introduction to geodetic surveying

Total Station: Introduction Accessories with description - Features of total station Onboard software electronic data reading - Summary of total stations characteristics.

Text Books:

1. R. Subramanian, Surveying and Levelling Oxford University Press, 2nd edition, 2012
2. B.C. Punnia Surveying Vol - I, II, III Laxmi publications, Delhi-6

Reference Books:

1. Kanetkar, T.P. & S.V. Kulkarni, Puna vidyarthi girha, Prakashan Surveying and levelling part I & II, 23rd edition, 1993.
2. Arora K. R. "Surveying Vol-I", Rajsons Publications Pvt. Ltd, 10th Edition, 20



SURVEYING

Course code : 15 CE 2105
Pre Requisite : NIL

(L T P) : 3-0-2
Credits : 4

Syllabus:

Surveying Introduction - Overview of plane surveying (chain, compass and plane table). Objectives, Principles and classifications.

Distances and Direction - Distance measurement conventions and methods; use of chain and tape. Electronic distance measurements, Meridians, Azimuths and Bearings, declination, computation of angle.

Leveling and Contouring - Concept and Terminology, Temporary and permanent adjustments- method of leveling. Characteristics and Uses of contours- methods of conducting contour surveys and their plotting.

Computation of Areas and Volumes - Area from field notes, computation of areas along irregular boundaries and area consisting of regular boundaries. Embankments and cutting for a level section and two level sections with and without transverse slopes, determination of the capacity of reservoir, volume of barrow pits.

Theodolite - Theodolite, description, uses and adjustments - temporary and permanent, measurement of horizontal and vertical angles. Principles of Electronic Theodolite, Trigonometrical leveling, Traversing.

Tachometric Surveying - Stadia and tangential methods of Tacheometry. Distance and Elevation formulae for Staff vertical position.

Curves - Types of curves, design and setting out simple curves. Introduction to geodetic surveying

Total Station: Introduction Accessories with description - Features of total station Onboard software electronic data reading - Summary of total stations characteristics **Field procedure of total stations** **Introduction to topographic data collection using total station** **Introduction to Geographic information system (GIS)**

Text Books:

1. R. Subramanian, Surveying and Levelling Oxford University Press, 2nd edition, 2012
2. B.C. Punmia Surveying Vol - I, II, III Laxmi publications, Delhi-6

Reference Books:

1. Kanetkar, T.P. & S.V. Kulkarni, Puna vidyarthi girha, Prakashan Surveying and levelling part I & II, 23rd edition, 1993.
2. Arora K. R. "Surveying Vol-I", Rajsons Publications Pvt. Ltd, 10th Edition, 2012.

Ch. G.

PRESTRESSED CONCRETE

Course code : 15 CE 4158

Pre Requisite : 15 CE 3112

(L T P) : 3-0-0

Credits : 3

Syllabus:

Basic terminology and concepts of prestressing; Need for High strength steel and high strength concrete; as material for prestressed concrete Advantages of prestressed concrete. Prestressing Systems: pretensioning; Post tensioning; Thermoelectric prestressing; chemical prestressing.

Analysis of Prestress and Bending Stresses: Resultant stresses; Pressure (Thrust) line and internal resisting couple; Concept of Load balancing; Stresses in tendons; Cracking moment. Losses of Prestress: due to elastic deformation, shrinkage, creep of concrete, relaxation of stress in steel, friction and anchorage slip; Total losses allowed for in design.

Deflections: Factors influencing deflections; Short term deflections of un-cracked members; Effect of tendon profile on deflections. Ultimate flexural strength of simple sections using simplified IS code Recommendations.

DESIGN OF PRESTRESSED CONCRETE BEAM: Design of sections for flexure - stress condition - minimum section modulus - stresses at transfer - service loads - prestressing force - eccentricity - check for stresses - initial and final conditions - limit state of collapse in flexure - shear. IS Code recommendations; Ultimate shear resistance. Design of shear reinforcement.

Design of end blocks: Transmission of prestress in pretensioned members; Transmission Length; Anchorage stress in post tensioned members; Bearing stress and bursting tensile force stresses in end blocks-Methods.

Text Books:

1. N. Krishna Raju; Prestressed Concrete Tata McGraw - Hill Publishing Company Limited, New Delhi.
2. P. Dayarathnam; Pre-stressed Concrete- Oxford and IBH Publishing Co.
3. Indian standard code of practice for prestressed concrete (IS -1343-1980); Bureau of Indian standards New Delhi

Reference Books:

1. N. Rajagopalan; Prestressed concrete Narosa Publishing House.
2. T.Y. Lin and Ned H. Burns Design of pre-stressed concrete structures - John Wiley & Sons, New York.
3. N.C. Sinha & S.K. Roy Fundamental of pre-stressed concrete-

Ch. by

PRESTRESSED CONCRETE

Course code : 15 CE 4158

Pre Requisite : 15 CE 3112

(L T P) : 3-0-0

Credits : 3

Syllabus:

Basic terminology and concepts of prestressing; Need for High strength steel and high strength concrete; as material for prestressed concrete Advantages of prestressed concrete, Prestressing Systems: pretensioning; Post tensioning; Thermoelectric prestressing; chemical prestressing.

Analysis of Prestress and Bending Stresses; Resultant stresses; Pressure (Thrust) line and internal resisting couple; Concept of Load balancing; Stresses in tendons; Cracking moment. Losses of Prestress: due to elastic deformation, shrinkage, creep of concrete, relaxation of stress in steel, friction and anchorage slip; Total losses allowed for in design.

Deflections; Factors influencing deflections; Short term deflections of un-cracked members; Effect of tendon profile on deflections. Ultimate flexural strength of simple sections using simplified IS code Recommendations.

DESIGN OF PRESTRESSED CONCRETE BEAM: Design of sections for flexure - stress condition - minimum section modulus - stresses at transfer - service loads - prestressing force - eccentricity - check for stresses - initial and final conditions - limit state of collapse in flexure - shear. IS Code recommendations: Ultimate shear resistance. Design of shear reinforcement.

Design of end blocks; Transmission of prestress in pretensioned members; Transmission Length; Anchorage stress in post tensioned members; Bearing stress and bursting tensile force stresses in end blocks-Methods. **IS Code provisions for design and detailing of prestressed concrete beams.**

Text Books:

1. N. Krishna Raju; Prestressed Concrete Tata McGraw - Hill Publishing Company Limited, New Delhi.
2. P. Dayarathnam; Pre-stressed Concrete- Oxford and IBJ Publishing Co.
3. Indian standard code of practice for prestressed concrete (IS -1343-1980); Bureau of Indian standards New Delhi

Reference Books:

1. N. Rajagopalan; Prestressed concrete Narosa Publishing House.
2. T.Y. Lin and Ned H. Burns Design of pre-stressed concrete structures - John Wiley & Sons, New York.
3. N.C. Sinha & S.K. Roy Fundamental of pre-stressed concrete-

Ch. Wj

Design of Reinforced Concrete Structures

Course code : 15 CE 3112
Pre Requisite : 15CE2206, 15CE2104

(L T P) : 3-0-2
Credits : 4

Syllabus:

Introduction to working stress method: Introduction, Design for bending, Analysis and design of singly reinforced and doubly reinforced beams.

Introduction to limit state design: Concepts of limit state design, Characteristic loads, Characteristic strength, Partial loads and Material Safety factors, Representative stress, Strain curves, Assumptions in limit state design, Stress block parameters, Limiting moment of resistance.

Singly and doubly reinforced beams: Limit state analysis and design of singly reinforced, doubly reinforced beams. **Flanged sections:** Limit state design of T and L beam sections.

Shear, torsion and bond: Limit state analysis and design of sections for shear and torsion, Concept of bond, anchorage and development length, IS Code provisions, Design examples in simply supported beams.

Slabs: Design of one way slabs, Two way slabs, Continuous slabs using IS coefficients. **Columns:** Short and long columns Uni axial loads.

Footings: Footings: Different types of footings–Design of isolated, square, rectangular and circular footings.

Text Books:

1. Pillai & Devdas Menon, "Reinforced concrete design", 3rd Edition, Tata McGraw Hill, New Delhi, 2009.
2. A.K.Jain, "Reinforced Concrete Design", 5th edition, Charotar Publications, 2010.
3. M.L.Gambhir, "Design of Reinforced Concrete Structures" 6th Edition, PHI, Delhi, 2013.

Reference Books:

1. N.C. Sinha and S.K Roy, "Fundamentals of Reinforced Concrete", 4th Edition, S. Chand publishers, 2002
2. N. Krishna Raju and R.N. Pranesh, "Reinforced Concrete Design", 8th Edition, New age International Publishers, New Delhi, 2004.



Design of Reinforced Concrete Structures

Course code : 15 CE 3112
Pre Requisite : 15CE2206, 15CE2104

(L T P) : 3-0-2
Credits : 4

Syllabus:

Introduction to working stress method: Introduction, Design for bending, Analysis and design of singly reinforced and doubly reinforced beams.

Introduction to limit state design: Concepts of limit state design, Characteristic loads, Characteristic strength, Partial loads and Material Safety factors, Representative stress, Strain curves, Assumptions in limit state design, Stress block parameters, Limiting moment of resistance.

Singly and doubly reinforced beams: Limit state analysis and design of singly reinforced, doubly reinforced beams. **Flanged sections:** Limit state design of T and L beam sections.

Shear, torsion and bond: Limit state analysis and design of sections for shear and torsion. Concept of bond, anchorage and development length, I.S Code provisions. Design examples in simply supported beams.

Slabs: Design of one way slabs, two way slabs, Continuous slabs using IS coefficients.

Columns: Short and long columns Uni axial loads ~~Uni axial bending and Biaxial bending~~ IS code provisions.

Footings: Footings: Different types of footings—Design of isolated, square, rectangular and circular footings.

Text Books:

1. Pillai & Devdas Menon, "Reinforced concrete design", 3rd Edition, Tata McGraw Hill, New Delhi, 2009.
2. A.K.Jain, "Reinforced Concrete Design", 5th edition, Charotar Publications, 2010.
3. M.L.Gambhir, "Design of Reinforced Concrete Structures" 6th Edition, PIII, Delhi, 2013.

Reference Books:

1. N.C. Sinha and S.K Roy, "Fundamentals of Reinforced Concrete", 4th Edition, S. Chand publishers, 2002
2. N. Krishna Raju and R.N. Pranesh, "Reinforced Concrete Design", 8th Edition, New age International Publishers, New Delhi, 2004.

Ch. W.

Hydraulics and Hydraulic Machines

Course code : 15 CE 2209

Pre Requisite : 15 CE 2102

(L T P) : 3-0-2

Credits : 4

Syllabus:

Open Channel Flow: Definition, classification, and Comparison between open channel flow and pipe flow. Types of channels, Chezy's and Manning's equation, Flow through rectangular, Trapezoidal and Circular channels Most efficient channel section -Rectangular, Trapezoidal. Specific energy, Specific energy diagram, Critical flow, critical flow in rectangular channel, critical slope, Froude's number Channel transitions.

Gradually Varied Flow (GVF): Gradually varied flow in rectangular channels-equation. Water surface slope w.r.t. channel bed and horizontal, Classification of channel slopes, classification of surface profiles, Backwater and draw down curves.

Rapidly Varied Flow (RVF): Hydraulic jump, elements and characteristics of hydraulic jump. Types of hydraulic jump. Location and applications of hydraulic jump. Energy loss in a hydraulic jump.

Impact of Jets: Force exerted by the jet on a stationary plate vertical, inclined and curved. Force exerted by a jet on a hinged plate on moving plates, force exerted by jet on flat plates and series of vanes.

Turbines: Introduction, classification of turbines, pelton wheel, velocity triangles and work done on Pelton wheel. Design of Pelton wheel.

Reaction Turbines Radial flow reaction turbine, Velocity triangles and work done by water on runner, Francis turbine, Design of Francis turbine, Axial flow reaction turbine Kaplan turbine, head and efficiency, Draft tube types, draft tube theory, efficiency of draft tube, Specific speed, Unit quantities, Selection of turbines, Cavitation.

Centrifugal Pumps: Manometric head; losses and efficiencies; work done, working principle; priming; velocity triangles; performance and characteristics curves; multistage and double suction pumps, Cavitation effects.

Reciprocating Pumps: Classification of reciprocating pump, working principle. Discharge through reciprocating pump, Negative slip Discharge, work done, and power required to drive double acting pump.

Text Books:

1. P. N. Modi & S. N. Seth; Hydraulics & Fluid Mechanics Standard Book house, New Delhi

A. K. Jain; Fluid Mechanics Khanna Publishers, Delhi

Reference Books:

1. V.T.Chow, Open Channel flow Mc.Graw Hill book company

2. Subramanya K, "Flow in Open channels", Tata McGraw-Hill Publishing Company, 1994.

3. Robert W.Fox and Alan T. Mc Donald, "Introduction to Fluid Mechanics" Fourth Edition, John Willey & sons, New York, 1995.

4. Jagadhishlal; Hydraulic Machines Metropolitan Company, Delhi.

Hydraulics and Hydraulic Machines

Course code : 15 CE 2209
Pre Requisite : 15 CE 2102

(L T P) : 3-0-2
Credits : 4

Syllabus:

Open Channel Flow: Definition, classification, and Comparison between open channel flow and pipe flow. Types of channels, Chezy's and Manning's equation, Flow through rectangular, Trapezoidal and Circular channels Most efficient channel section -Rectangular, Trapezoidal. Specific energy, Specific energy diagram, Critical flow, critical flow in rectangular channel, critical slope, Froude's number Channel transitions.

Gradually Varied Flow (GVF): Gradually varied flow in rectangular channels-equation, Water surface slope w.r.t. channel bed and horizontal, Classification of channel slopes, classification of surface profiles, Backwater and draw down curves.

Rapidly Varied Flow (RVF): Hydraulic jump, elements and characteristics of hydraulic jump, Types of hydraulic jump, Location and applications of hydraulic jump, Energy loss in a hydraulic jump.

Impact of Jets: Force exerted by the jet on a stationary plate vertical, inclined and curved, Force exerted by a jet on a hinged plate on moving plates, force exerted by jet on flat plates and series of vanes.

Turbines: Introduction, classification of turbines, Pelton wheel, velocity triangles and work done on Pelton wheel, Design of Pelton wheel.

Reaction Turbines Radial flow reaction turbine, Velocity triangles and work done by water on runner, Francis turbine, Design of Francis turbine, Axial flow reaction turbine Kaplan turbine, head and efficiency, Draft tube types, draft tube theory, efficiency of draft tube, Specific speed, Unit quantities, Selection of turbines, Cavitation.

Centrifugal Pumps: Manometric head; losses and efficiencies; work done, working principle; priming; velocity triangles; performance and characteristics curves; multistage and double suction pumps, Cavitation effects.

Reciprocating Pumps: Classification of reciprocating pump, working principle, Discharge through reciprocating pump, Negative slip Discharge, work done and power required to drive double acting pump.

Text Books:

2. P. N. Modi & S. N. Seth; Hydraulics & Fluid Mechanics Standard Book house, New Delhi
- A. K. Jain; Fluid Mechanics Khanna Publishers, Delhi

Reference Books:

5. V. T. Chow, Open Channel flow Mc.Graw Hill book company
6. Subramanya K, "Flow in Open channels", Tata McGraw-Hill Publishing Company, 1994.
7. Robert W. Fox and Alan T. Mc Donald, "Introduction to Fluid Mechanics" Fourth Edition, John Willey & sons, New York, 1995.
8. Jagadhislal; Hydraulic Machines Metropolitan Company, Delhi.

Green Buildings

Course code : 15 CE 4174

Pre Requisite : NIL

(L T P): 3-0-0

Credits : 3

Syllabus:

Green Buildings, Green Building Principles, Benefits of green building Global warming, requirement of Green Building, Rating Systems IGBC, GRIHA, USGBC, LEED, BREEAM, CASBEE, GBTool, HK-Beam. Requisites for Constructing a Green Building, sustainable construction focus point: site, water, energy, material, indoor air quality, construction procedures.

Rating systems in India, IGBC green home rating system, Benefits of IGBC, procedure to get IGBC certification, procedure to become IGBC certified engineering professional, GRIHA ratings, procedure to get GRIHA certification.

Site issues: site analysis and design, site development and layout, Building and Site Requirements, Transportation, Plant Materials and Management.

Water issues: watershed protection, drainage of concentrated Runoff, water efficiency and conservation, rain water harvesting, water reclamation.

Sustainable materials: Reduce / Reuse / Recycle, Natural Sources, concrete, masonry, metals, wood and plastic, finishes, Green paints

Passive solar design, Day lighting, Building envelope, Renewable energy, Significance, design principle, ventilation control, occupant activity control, significance of acoustics.

Environmental construction guidelines, building operations and maintenance.

Economics of green buildings, Selecting environmentally and economically balanced building materials, Project cost, Income and expenses.

Text Books (Max. 2 books):

1. R.K. Gautham, Green homes, BS publications.
2. Public Technology Inc., US Green Building Council. Sustainable building technical manual- Green building design, constructions and operation
3. A bridged reference guide to IGBC Green homes rating system Version 1.0

Reference Books:

1. Tree Hugger Consulting, Green Building A Basic Guide to Building and Remodeling Sustainably
2. Tom Woolley, Sam Kimmins, Paul Harrison and Rob Harrison; E & FN Spon, an imprint of Thomson Science & Professional Green BIM: Successful Sustainable Design with Building Information Modeling, Eddy Krygiel, Bradley Nies, Green Building Handbook, Volume 1 Willy publishing Inc.



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Course code : 15 CE 4174
Pre Requisite : NIL

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