



MAR ATHANASIUS COLLEGE OF ENGINEERING
KOTHAMANGALAM

CIVIL ENGINEERING DEPARTMENT

LIST OF COURSE OUTCOME

M.TECH 2015 SCHEME

STRUCTURAL ENGINEERING AND CONSTRUCTION MANAGEMENT

SEMESTER	SUBJECT CODE	SUBJECT NAME	CO NO:	CO DESCRIPTION
S1	05CE 6101	Advanced design of concrete structures	1	Understand the principles of structural design
			2	Design and develop analytical skills.
			3	Summarize the principles of structural design and detailing
			4	Understand the structural performance.
S1	05CE 6103	Theory of elasticity	1	Develop the concept of stress-strain tensors and their relationships In 3d continuum problem
			2	Idealize physical problems into plane stress and Plane strain problems and solve them using stress functions.
			3	Identify the effect of torsion in thin-walled and Irregular closed/open sections.
			4	Apply various failure criteria for general stress states at points.
S1	05CE 6105	Construction planning scheduling and control	1	To study basic concepts in the development of construction plans
			2	To understand the relevance of construction schedules.
			3	To understand the significance of cost control
			4	To acquire a deep knowledge in quality control
S1	05CE 6107	Construction management & engineering economics	1	Discuss and communicate the management evolution.
			2	Participate in the design and utilization of Computer based information systems.
			3	Evaluate and take economic decisions in construction projects.
			4	To understand the theory and practice in construction planning, Scheduling and control.

S1	05CE 6113	Modern construction materials	1	Review the behaviour of different construction materials
			2	Compare the various techniques for the characterization of Construction material
			3	Differentiate the factors that change the material properties
			4	Inspect the different method of analysis of the materials used in construction
S1	05CE6177	Research methodology	1	The significance of different types of research and its various stages.
			2	The different methods of data collection.
			3	Different methods for analyzing data and interpreting the results.
			4	The proper way of reporting and presenting the outcome.
S1	05CE 6191	Structural engineering design studio	1	Understand the principles of structural analysis and design of a structure using software
			2	To enable the students to take up any management project of relevance in the field of construction management and to tackle them using software
			3	An ability to write a substantial technical report/document
			4	Compete their subject knowledge globally
S2	05CE 6102	Finite element analysis	1	The students will understand the fundamental theory of the fea method.
			2	The students will understand the use of the basic finite elements for structural applications using truss, beam and plane elements.
			3	The students will identify mathematical model for solution of common engineering problems.
			4	The students will derive the element matrix equation by different methods by applying basic laws in mechanics.
S2	05CE 6104	Advanced concrete technology	1	Identify the functional role of aggregates, admixture and cement in concrete and determine its properties as per specification

			2	Acquire and determine the engineering properties of fresh and hardened concrete. To design a concrete mix methods to fulfill the required properties of fresh and hardened concrete
			3	Select and design special concrete depending on their specific applications by using special methodology
			4	Evaluate the effect of structure on service life based on durability and demonstrate the technique of nondestructive testing of concrete
S2	05CE6106	Project planning and implementation	1	Familiar with different stages of planning in construction
			2	Acquire knowledge about productivity analysis.
			3	Familiar with quality management
			4	Understand and learn the safety measures used in construction.
S2	05CE 6126	Construction personnel management	1	To acquire knowledge on manpower planning
			2	To acquire knowledge on organising a labour force in a construction organisation.
			3	To have an idea on human relations and organisational behaviour
			4	To get an idea on developing, maintaining and utilising a labour force in a construction organisation.
S2	05CE6132	Bridge engineering	1	Understand and use the basic concepts in proportioning and design of bridges in terms of aesthetics, geographical location and functionality.
			2	Develop an intuitive feeling about the sizing of bridge elements and the conceptual design part
			3	Assess the load flow mechanism and loads on bridges.
			4	Design of bridge and its foundation starting from conceptual design, selecting suitable bridge, geometry to sizing of its elements
S2	05CE 6166	Seminar - i	1	Present new thoughts and ideas about challenging streams in structural engineering

			2	Improve communication skills and attain good mannerism and body language during presentations.
			3	Compete their subject knowledge globally.
			4	To improve their ability to incorporate various suggestions and improvise them and to write a substantial technical report/document
S2	05CE 6188	Mini project	1	To develop practical ability and knowledge about practical problems related to the industry.
			2	To improve the presentation skills
			3	To write and present a substantial technical report/document
			4	To gain exposure to field problems and managing site conditions by making several visits to various construction sites which are at different stages of construction.
S2	05CE 6192	Computer applications lab	1	Understand the elements of finite element modelling, specification of loads and boundary condition, performing analysis and interpretation of results for final design
			2	Understand the principles of structural analysis and design of a structure using software
			3	An ability to write a substantial technical report/document
			4	Compete their subject knowledge globally
S3	05CE 7145	Maintenance and rehabilitation of structures	1	Understand the cause of deterioration of concrete structures.
			2	Design and develop analytical skills.
			3	Summarize the principles of repair and rehabilitation of structures.
			4	Understands the concept of serviceability and durability.
S3	05CE 7153	Construction project management	1	Acquire knowledge about identification of project, preparation of project reports and feasibility study of various construction projects.
			2	Acquire knowledge about material management

			3	Acquire knowledge about current practices in construction accounts and its management
			4	Acquire knowledge about risks and insurance in construction
S3	05CE 7167	Seminar – ii	1	Present new thoughts and ideas about challenging streams in structural engineering
			2	Improve communication skills and attain good mannerism and body language during presentations.
			3	Compete their subject knowledge globally.
			4	To improve their ability to incorporate various suggestions and improvise them and to write a substantial technical report/document
S3	05CE 7187	Project (phase-i)	1	To improve the technical skill
			2	An ability to write a substantial technical report/document
			3	To address a practical problem and to solve social issues.
			4	To improve the presentation skills
S4	05CE 7188	Project (phase-ii)	1	To improve the technical skill
			2	An ability to write a substantial technical report/document
			3	To address a practical problem and to solve social issues.
			4	To improve the presentation skills
2. CASE				
S1	05CE6001	Advanced design of concrete structures	1	Understand the principles of structural design
			2	Design and develop analytical skills.
			3	Summarize the principles of structural design and detailing
			4	Understand the structural performance.
S1	05CE6003	Theory of elasticity	1	Develop the concept of stress-strain tensors and their relationships in 3d continuum problem
			2	Idealize physical problems into plane stress and plane strain problems and solve them using stress functions.

			3	Identify the effect of torsion in thin-walled and irregular closed/open sections.
			4	Apply various failure criteria for general stress states at points.
S1	05CE6005	Structural dynamics	1	To understand the basic concepts of structural dynamics and relevance modelling structures as continuous system, single or multiple degree, of, freedom systems.
			2	To apply the principles of structural dynamics to practical problems.
			3	Express structural dynamics problem as equivalent problems of statics.
			4	Understand the significance of damping and resonance in structures.
S1	05CE6007	Prestressed concrete	1	Understand the basic concepts of prestressed concrete, methods and its use.
			2	Analyse, comprehend the design and detailing of prestressed concrete structures used in practice.
			3	Design and detailing of common prestressed structural elements.
			4	Innovative methods in prestressed members and construction.
S1	05CE6011	Advanced analysis of structures	1	Understand the energy principles and its application.
			2	Appreciate the significance of stiffness matrix method as a tool for analysing structural forms with far less computational effort.
			3	To obtain the output of the common structural forms using stiffness method.
			4	Flexibility matrix method and its application in common structural forms.
S1	05CE6077	Research methodology	1	The significance of different types of research and its various stages.
			2	The different methods of data collection.
			3	Different methods for analyzing data and interpreting the results.
			4	The proper way of reporting and presenting the outcome.

S1	05CE6091	Structural engineering design studio	1	Achieve knowledge and understand the principles of structural analysis, design and summarise the performance of structures for static and dynamic forces
			2	Understand the principles of structural analysis and design of a structure using software
			3	An ability to write a substantial technical report/document
			4	Compete their subject knowledge globally
S2	05CE6002	Finite element method	1	Tackle all engineering continuum problems and idealize actual physical problems into mathematical model and then to a finite element model.
			2	Solve continuum mechanics problem using existing finite element method software packages.
			3	Evaluate, interpret and assess the finite element analysis results for design and evaluation purposes.
			4	Extend the knowledge of the application of finite element method.
S2	05CE6004	Design of bridges	1	Understand and use the basic concepts in proportioning and design of bridges in terms of aesthetics, geographical location and functionality.
			2	Develop an intuitive feeling about the sizing of bridge elements and the conceptual design part.
			3	Assess the load flow mechanism and design of sub structures
			4	Case studies and innovations in bridge engineering.
S2	05CE6006	Theory of plates and shells	1	Understand the classification of plates and relevant theory to be applied for their analysis
			2	The classic theory of thin plates and apply navier's and levy's solution to analyse problems related to thin plates
			3	Analysis of circular plates subjected to axi-symmetric loads
			4	The behaviour of shells and apply classic theories for analysis of simple shells
S2	05CE6022	Earthquake resistant design of structures	1	The student will understand the basic concepts and its importance on the design of seismic resistant structures

			2	Select appropriate structural systems, configurations and proportions so as to resist earthquake effects and understand detailing of rcc and steel members
			3	Do the design and detailing of structures for seismic resistance as per indian standards and for ductile behaviour as per code provisions
			4	Summarize the seismic evaluation and retrofitting of structures and awareness about disaster management due to earthquakes
S2	05CE6032	Microstructure and innovations in structural concrete	1	Identify the structure property relationships
			2	Predict the reduction in the properties of concrete exposed to higher temperatures and familiarise various supplementary cementitious materials
			3	Approaches of mix design and specify the self compacting concrete
			4	Interpret xrd patterns, sem images and tga curves.
S2	05CE6066	Seminar - i	1	Present new thoughts and ideas about challenging streams in structural engineering
			2	Improve communication skills and attain good mannerism and body language during presentations
			3	Compete their subject knowledge globally
			4	To improve their ability to incorporate various suggestions and improvise them and to write a substantial technical report/document
S2	05CE6088	Mini project	1	To develop practical ability and knowledge about practical problems related to the industry
			2	To improve the presentation skills
			3	To write and present a substantial technical report/document
			4	To gain exposure to field problems and managing site conditions by making several visits to various construction sites which are at different stages of construction
S2	05CE6092	Computer applications lab	1	Achieve knowledge of analysis and development of programming skills

			2	Use industry and research standard software in a professional set up.
			3	Understand the elements of finite element modelling, specification of loads and boundary condition, performing analysis and interpretation of results for final design
			4	Compete their subject knowledge globally
S3	05CE7041	Stability of structures	1	Appreciate and understand the principles of strength and stability.
			2	Different approaches related to stability of columns.
			3	To understand the behaviour of beam column and frame buckling.
			4	To understand the behaviour of beam column and frame buckling.
S3	05CE7051	Numerical methods in structural engineering	1	Understand various computational methods available to solve practical problems and eigen value problems etc., applied in structural engineering.
			2	Enhance the capacity to select the most appropriate techniques for tackling problems by numerical integration in structural engineering.
			3	Inculcate an ability to solve numerically many types of problems numerical differentiation.
			4	Familiarise numerical differentiation in plate bending problems with different end and loading conditions.
S3	05CE7067	Seminar-ii	1	Present new thoughts and ideas about challenging streams in structural engineering
			2	Improve communication skills and attain good mannerism and body language during presentations.
			3	Compete their subject knowledge globally.
			4	To improve their ability to incorporate various suggestions and improvise them and to write a substantial technical report/document
S3	05CE7087	Project (phase 1)	1	Inculcate the reading habit and identify the hidden ideas & interrupt complexities in the journal paper
			2	To address a practical problem and establish solution techniques.

			3	Formulate mathematical models to suit the problem selected.
			4	Improve the preparation and presentation skills.
S4	05CE 7188	Project (phase-ii)	1	Organize and coordinate the investigation techniques in the correct hierarchy to suit the problem.
			2	Improve the skill for result analysis and interpretation.
			3	Correlate the interpreted solution with established and existing ideas.
			4	Impart an ability to write and present technical documents like report, journal papers etc.