MAR ATHANASIUS COLLEGE OF ENGINEERING

KOTHAMANGALAM

CIVIL ENGINEERING DEPARTMENT

LIST OF COURSE OUTCOME

B.TECH 2015 SCHEME

SEMESTER	COURSE CODE	COURSE NAME	CO NO:	CO DESCRIPTION
S1	MAT101	Linear algebra and calculus	1	Solve systems of linear equations, diagonalize matrices and characterize quadratic forms
			2	Compute the partial and total derivatives and maxima and minima of multivariable functions
			3	Compute multiple integrals and apply them to find areas and volumes of geometrical shapes, mass and centre of gravity of plane laminas
			4	Perform various tests to determine whether a given series is convergent, absolutely convergent or conditionally convergent
			5	Determine the taylor and fourier series expansion of functions and learn their applications
			6	
S1	PH 110	Engineering physics b	1	Compute the quantitative aspects of waves and oscillations in engineering systems.
			2	Apply the interaction of light with matter through interference, diffraction and identify these phenomena in different natural optical processes and optical instruments.
			3	Analyze the behaviour of matter in the atomic and subatomic level through the principles of quantum mechanics to perceive the microscopic processes in electronic devices.
			4	Apply the knowledge of ultrasonics in non-destructive testing and use the principles of acoustics to explain the nature and characterization of acoustic design and to provide a safe and healthy environment
			5	Apply the comprehended knowledge about laser and fibre optic communication systems in various engineering applications
S1	EST 110	Engineering graphics	1	Draw the projection of points and lines located in different quadrants
			2	Prepare multiview orthographic projections of objects by visualizing them in different positions
			3	Draw sectional views and develop surfaces of a given object

			4	Prepare pictorial drawings using the principles of isometric and perspective projections to visualize objects in three dimensions.
			5	Convert 3d views to orthographic views
			6	Obtain multiview projections and solid models of objects using cad tools

S1	EST 130	Basics of electrical & electronics engineering	1	Apply fundamental concepts and circuit laws to solve simple dc electric circuits
			2	Develop and solve models of magnetic circuits
			3	Apply the fundamental laws of electrical engineering to solve simple ac circuits in steady state
			4	Describe working of a voltage amplifier
			5	Outline the principle of an electronic instrumentation system
			6	Explain the principle of radio and cellular communication

S1	HUT 101	Life skills	1	Define and identify different life skills required in personal and professional life
			2	Develop an awareness of the self and apply well-defined techniques to cope with emotions and stress.
			3	Explain the basic mechanics of effective communication and demonstrate these through presentations.
			4	Take part in group discussions
			5	Use appropriate thinking and problem solving techniques to solve new problems
			6	Understand the basics of teamwork and leadership

S1	PHL 120	Engineering physics lab	1	Develop analytical/experimental skills and impart prerequisite hands on experience for engineering laboratories
			2	Understand the need for precise measurement practices for data recording
			3	Understand the principle, concept, working and applications of relevant technologies and comparison of results with theoretical calculations
			4	Analyze the techniques and skills associated with modern scientific tools such as lasers and fiber optics
			5	Develop basic communication skills through working in groups in performing the laboratory experiments and by interpreting the results

			6	

S1	ESL 130	Electrical & electronics workshop	1	Demonstrate safety measures against electric shocks.
			2	Identify the tools used for electrical wiring, electrical accessories, wires, cables, batteries and standard symbols
			3	Develop the connection diagram, identify the suitable accessories and materials necessary for wiring simple lighting circuits for domestic buildings
			4	Identify and test various electronic components
			5	Draw circuit schematics with eda tools
			6	Assemble and test electronic circuits on boards

S2	MAT 102	Vector calculus, differential equations and transforms	1	Compute the derivatives and line integrals of vector functions and learn their applications
			2	Evaluate surface and volume integrals and learn their inter-relations and applications.
			3	Solve homogeneous and non-homogeneous linear differential equation with constant coefficients
			4	Compute laplace transform and apply them to solve odes arising in engineering
			5	Determine the fourier transforms of functions and apply them to solve problems arising in engineering
			6	

S2	CYT 100	Engineering chemistry	1	Apply the basic concepts of electrochemistry and corrosion to explore its possible applications in various engineering fields.
			2	Understand various spectroscopic techniques like uv-visible, ir, nmr and its applications
			3	Apply the knowledge of analytical method for characterizing a chemical mixture or a compound. Understand the basic concept of sem for surface characterisation of nanomaterials.
			4	Learn about the basics of stereochemistry and its application. Apply the knowledge of conducting polymers and advanced polymers in engineering.
			5	Study various types of water treatment methods to develop skills for treating wastewater.
			6	

S2	EST 100	Engineering mechanics	1	Recall principles and theorems related to rigid body mechanics

			2	Identify and describe the components of system of forces acting on the rigid body
			3	Apply the conditions of equilibrium to various practical problems involving different force system
			4	Choose appropriate theorems, principles or formulae to solve problems of mechanics.
			5	Solve problems involving rigid bodies, applying the properties of distributed areas and masses
			6	

S2	EST 120	Basics of civil & mechanical engineering	1	Recall the role of civil engineer in society and to relate the various disciplines of civil engineering.
			2	Explain different types of buildings, building components, building materials and building construction
			3	Describe the importance, objectives and principles of surveying.
			4	Summarise the basic infrastructure services mep, hvac, elevators, escalators and ramps
			5	Discuss the materials, energy systems, water management and environment for green buildings.
			6	Analyse thermodynamic cycles and calculate its efficiency

S2	HUT 102	Professional communication	1	Analyze, interpret and effectively summarize a variety of textual content
			2	Create effective technical presentations
			3	Discuss a given technical/non-technical topic in a group setting and arrive at generalizations/consensus
			4	Identify drawbacks in listening patterns and apply listening techniques for specific needs
			5	Create professional and technical documents that are clear and adhering to all the necessary conventions
			6	

S2	EST 102	Programming in c	1	Analyze a computational problem and develop an algorithm/flowchart to find its solution
			2	Develop readable* c programs with branching and looping statements, which uses arithmetic, logical, relational or bitwise operators
			3	Write readable c programs with arrays, structure or union for storing the data to be processed
			4	Divide a given computational problem into a number of modules and develop a readable

				multi-function c program by using recursion if required, to find the solution to the computational problem
			5	Write readable c programs which use pointers for array processing and parameter passing
			6	Develop readable c programs with files for reading input and storing output

S2	CYL 120	Engineering chemistry lab	1	Understand and practice different techniques of quantitative chemical analysis to generate experimental skills and apply these skills to various analyses
			2	Develop skills relevant to synthesize organic polymers and acquire the practical skill to use tlc for the identification of drugs 3 develop the ability to understand a
			3	Develop the ability to understand and explain the use of modern spectroscopic techniques for analysing and interpreting the ir spectra and nmr spectra of some organic compounds
			4	Acquire the ability to understand, explain and use instrumental techniques for chemical analysis
			5	Learn to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments
			6	Function as a member of a team, communicate effectively and engage in further learning. Also understand how chemistry addresses social, economical and environmental problems and why it is an integral part of curriculum

S2	ESL 120	Civil & mechanical workshop	1	Ability to undertake survey using conventional equipments
			2	To acquire knowlwdge in taking accurate & complete notes in field work to serve as legal record
			3	To improve the ability to function as a member of survey party in completing assigned field work
			4	Identify basic mechanical workshop operations in accordance with the material and objects
			5	Apply appropriate tools and instruments with respect to the mechanical workshop trades
			6	Apply appropriate safety measures with respect to the mechanical workshop trades

S3	MA201		1	Identify analytic functions and harmonic functions.

		Linear algebra & complex analysis	2	Identify conformal mappings and some important transformations.
			3	Evaluation of integrals using cauchy integral formula.
			4	Evaluate real definite integrals as application of residue theorem.
			5	Solve any given system of linear equations.
			6	Find the eigenvalues of the matrix and how to diagonalize a matrix.

S3	CE201	Mechanics of solids	1	An ability to identify the strength characteristics iof various structural members subjected to axial loads
			2	An ability to develop and analyse abasic design of civil engineering complex indeterminate structures under axial load and change of temparature
			3	An ability to predict bending moment and shearing force of determinate structural members under lateral loading
			4	An ability to tackle engineering problems by predicting bending and shearing stresses under lateral loading
			5	An ability to analyse the response of oblique sections and the concept of stress tensor under combined loads and tha effect of structures under torsion
			6	An ability to understand the effect of column buckling and the deformation of structures under loads

S3	CE203	Fluid mechanics 1	1	Students will be able to understand various aspects of fluid statics in detail
			2	Students will be learning in detail about kinematics of fluid flow
			3	Students will have a better understanding in relation with dynamics of fluid flow
			4	Students will be able to gain knowledge in relation with dymanics of fluid flow
			5	Students will study in detail concepts in relation with pipe flow
			6	Students will get an idea in relation with boundary layer theory

S3	CE205	Geology	1	Students will be able to apply the knowledge from engineering geology to solve the problems affecting the society and take relevant measures to ensure the safety.

			2	Students will be able to solve the complex engineering problems regarding the availability of raw materials for construction and find suitable alternatives for the materials that are scarce
			3	The students shall interpret the various causes and effects of earthquakes and shall develop solutions to minimise the effects of earthquake.
			4	Identifying each mineral with respect to their physical properties helps students to classify the types and properties of rocks and their suitability in various fields of engineering.
			5	The knowledge of using various instruments helps the students to analyse various features on the earth and the attitude of geologic structures helps the students to analyse the complex engineering activities of the structures.
			6	By studying the various natural hazards, its causes, remedies and prevention can help students to tackle the occurrence of adverse situations in society.

S3	CE207	Surveying	1	Students will be able to use conventional surveying instruments like chain compass plane table etc....
			2	Students will be able to use levelling instruments
			3	Students will be able to attain knowledge in measurement of area & eartwork volume
			4	Students will be able to attain knowledge in triangulation survey
			5	Students will be able to attain knowledge in calculating mpv
			6	Students will be able to use various edm instruments

S3	HS210	Life skill	1	Communicate effectively
			2	Make effective presentation
			3	Face interview & group discussion
			4	Work in group & team
			5	Handle engineering ethics & human values
			6	Become an effective leader

S3	CE231	Civil engineering drafting lab	1	To understand the drawings of various components of buildings
			2	Preperation of buildings
			3	Interpretation of building drawings

			4	Use of a drafting software

S3	CE233	Surveying lab	1	Ability to undertake survey using conventional equipments
			2	To acquire knowlwdge in taking accurate & complete notes in field work to serve as legal record
			3	To improve the ability to function as a member of survey party in completing assigned field work
			4	To understand the need for licensed survey and to understand positioning information for propert & structure
			5	To develop the ability to utilize equipment according to the objective of project work
			6	To study about theodolite and total station

S4	MA202	Probability distributions, transforms andnumerical methods	1	To have a concept of discrete probability density functions and probabilty distributions like binomial distribution and poisson distribution.
			2	To have a concept of continuous probability density functions and probability distributions like norma ,gamma and exponential distribution.
			3	To use fourier integrals and fourier transforms in solving various engineering problems.
			4	To understand the concept of laplace and inverse laplace transforms and apply them to solve ordinary differential equations.
			5	To use the iteration and interpolation methods to solve engineering problems.
			6	To use the concept of numerical methods and their applications to solve linear systems and first order odes.

S4	CE202	Structural analysis i	1	Truss analysis using method of joints and section, castigliano’s theorem, strain energy
			2	Application of energy methods, and method of virtual work to statically determinate trusses, portal frames and beams
			3	Application of energy method to statically indeterminate trusses, portal frames and beams,
			4	Influence line diagram and moving loads
			5	Analysis of cables and suspension bridges
			6	Analysis of statically determinate arches

S4	CE204	Construction technology	1	To give an experience in the implementation of new technology concepts which are applied in field of advanced construction.
			2	To study different methods of construction to successfully achieve the structural design with recommended specifications.
			3	To study of construction equipments, and temporary works required to facilitate the construction process
			4	To provide a coherent development to the students for the courses in sector of advanced construction technology.
			5	To involve the application of scientific and technological principles of planning, analysis, design and management to construction technology.
			6	To present the new technology of civil engineering and concepts related advanced construction technology.

S4	CE206	Fluid mechanics ii	1	Get an insight of hydraulic turbines.
			2	Capable of understanding types of pumps and working of centrifugal pumps.
			3	Capable of analyzing open channel flows and designing open channels.
			4	Understand the dynamics behind hydraulic jump.
			5	Analyse gradully varied flow and design of trapezoidal channels.
			6	Understand the concept of dimensional analysis and model studies.

S4	CE208	Geotechnical engg i	1	Students will be able to understand the objectives of soil exploration and take judgements on various investigation steps
			2	Students will be able to understand the various methods, its procedures, apllicability and limitations of exploration methods
			3	Students will be able to corelate the values of various sounding methods with various engineering & index properties of soil
			4	The students will understand the various geophysical methods, its applications & limitations
			5	The students will acquire knowledge about the soil sampling and could take judgements in choosing the type of samplers
			6	The students will be capable to prepare the sub soil investigation reports

S4	HS200	Business economics	1	Make investment decisions based on capital budgeting methods in alignment microeconomic and macroeconomic theories.
			2	Able to analyse the profitability of the firm, economy of operation, determination of price under various market situations with good grasp on the effect of trade cycles in business.
			3	Gain knowledge on monetary theory, measures by rbi in controlling interest rate and emerging concepts like bitcoin.
			4	Gain knowledge of elementary accounting concepts used for preparing balance sheet and its interpretation.
			5	Identify the need for various credit control methods and the significance of national income concepts.
			6	Understand the functioning of the indian capital and money markets and the tax system.

S4	CE232	Material testing lab	1	Students will aquire knowledge on mechanical behavior of materials
			2	Students will be able to conduct experiments and determine the mechanical properties of materials

S4	CE234	Fluid mechanics lab	1	Ability to use different plumbing tools to construct piping systems
			2	Ability to calibrate flow rate measuring devices such as venturimeter, orifice meter and notches.
			3	Ability to measure the frictional losses in fluid flow and characterize laminar and turbulent flows.
			4	Ability to understand the importance of stability of the floating body.
			5	Ability to find the performance characteristics of hydraulic turbines and pumps under different working conditions.
			6	Ability to design of a piping systems and selection of suitable pump for transmission of drinking water.

S5	Ce301	Design of concrete structures i	1	Apply the fundamental concepts of limit state method
			2	Use is code of practice for the design of concrete elements

			3	Understand the structural behavior of reinforced concrete elements in bending, shear, compression and torsion.
			4	Design beams, slab, stairs, columns and draw the reinforcement details.
			5	Analyze and design for deflection and crack control of reinforced concrete members.
			6	Draw the reinforcement details of structural elements

S5	Ce303	Structural analysis ii	1	Assess the analysis of structures using force method
			2	Assess the analysis of structures using displacement methods
			3	Assess the analysis of structures using displacement methods
			4	Assess the analysis of structures using displacement methods
			5	Analysis of curved beams in plan
			6	Analysis of structures using plastic theory

S5	Ce305	Geotechnical engg	1	Students will be able to analyse the stresses transferred to the soil by various structures
			2	Students will be exposed to the geotechnical aspects of structures retaining soil
			3	Students will understand the possible bearing capacity & settlement failures challenging a design engineer
			4	The students will acquire basic design concepts of variouss shallow & deep foundations
			5	The students will be exposed to basic analysis of machine foundations covering undamped vibrations
			6	The students will get to know the basics of site investigations & guidelines practiced

S5	Ce307	Geomatics	1	Students will be able to create a fundamental basics on traverse surveying
			2	Students will be able to develop knowledge on fundamental concepts of curve surveying
			3	Students will be able to able to explain about the concepts of global navigation satellite system
			4	Students will be able to understand the methods in global positioning system
			5	Students will be able to get knowledge on remote sensing
			6	Students will be able to understand the concepts involved in geographical information system

S5	Ce309	Water resource engg	1	Students will be able to understand the hydrological cycle
			2	Students will be able to assess the surface runoff

			3	Students will be able to estimate the irrigation demand
			4	Students will be able to conduct stream flow measurement
			5	Students will be able to plan a reservoir
			6	Students will have the basic concepts of ground water hydrology

S5	Ce361	Advanced concrete technology	1	Identify the functional role of ingredients of concrete and apply this knowledge to mix design philosophy
			2	Acquire and apply fundamental knowledge in the fresh and hardened properties of concrete
			3	Evaluate the effect of the environment on service life performance, properties and failure modes of structural concrete demonstrate techniques of measuring the non destructive testing of concrete structure
			4	Develop an awareness of the utilisation of waste materials as novel innovative materials for use in concrete
			5	Design a concrete mix which fulfills the required properties for fresh and hardened concrete
			6	To study techniques of measuring the non destructive testing of concrete structure

S5	Ce363	Geotechnical investigation	1	Students will be able to understand the objectives of soil exploration and take judgements on various investigation steps
			2	Students will be able to understand the various methods, its procedures, apllicability and limitations of exploration methods
			3	Students will be able to corelate the values of various sounding methods with various engineering & index properties of soil
			4	The students will understand the various geophysical methods, its applications & limitations
			5	The students will acquire knowledge about the soil sampling and could take judgements in choosing the type of samplers
			6	The students will be capable to prepare the sub soil investigation reports

S5	Ce371	Environment and pollution	1	Understand the various aspects of ecology,ecosystem,material cycling
			2	Understanding the concepts of air pollution
			3	Recogonise the various aspects of water pollution
			4	Recogonise the various aspects of solid waste pollution
			5	Better understanding of soil degradation
			6	Develop basic understanding of noise pollution

S5	Ce341	Design project	1	To intiate on creative design thinking
			2	To make aware of the design process
			3	To familiarise prototyping
			4	Familiarise designing on various aspects of the product
			5	Familiarise value engineering
			6	Introduce optimisation in design and ipr related aspects

S5	Ce331	Materials testing lab ii	1	Students will be able to gain knowledge about the properties of construction materials with codal provisions.
			2	Students will be able to understand and compare the properties of fresh hardened concrete with indian standards.
			3	Enable the students to prepare concrete mixes of different grades.
			4	Enable the students to get a sound of knowledge in the selection of material's quality control to become a good practicing engineer.
			5	
			6	

S5	Ce333	Geotechnical engineering lab	1	Have capability to classify soils based on test results and interpret engineering behaviour based on test results
			2	Able to evaluate permeability and shear strength of soil
			3	Able to evaluate settlement characteristics of soil
			4	Able to evaluate compaction charcateristics required for field application
			5	Able to evaluate the swell characteristics of soil
			6	

S6	Ce302	Design of hydraulic structures	1	Students will be able to design diversion head work
			2	Students will be able to design canals
			3	Students will be able to design canal falls, aqueducts etc.
			4	Students will be able to do basic design of gravity dam
			5	Students will be able to design arch
			6	Students will be able to design embankment dam

S6	Ce304	Design of concrete structures ii	1	Design eccentrically loaded and slender columns using sp 16 design charts
			2	Design different types of foundations
			3	Design and detail cantilever retaining wall and understand the design principles of counterfort retaining wall

			4	Design and detail circular slabs and domes
			5	Design rectangular and circular water tank using is coefficients
			6	Gain knowledge of prestressed concrte fundamentals and analyse pre and post tensioned beams

S6	Ce306	Computer programming and computational techniques	1	Students will be able to analyze and program simple problems in c++
			2	Students will be able to build ip programs or more complex problems in c++
			3	Students will get acquainted with modular approach to com[plex problems
			4	The students will know bsics of oop style programming
			5	The students will be able to familiarize with basic numerical algorithms used in engineering
			6	The students will be able to familiarize with complex numerical algorithms used in engineering

S6	Ce308	Transportation engineering- i	1	Able to design the geometrics of roads - sd, radius, cross section elements
			2	To make the students aware of super elevation design, imporatance of transition curve and valley curve
			3	Able to design flexible pavements & its failures & traffic engineering charachters
			4	To provide awareness of design of traffic signal & study aircraft charachers which affect planning & design of aircrafts
			5	To provide the design of runways taxiways & various traffic control devices.
			6	

S6	Hs300	Principles of management	1	To understand the different management practice
			2	To know about the management thories and its application
			3	To know about the levels of planning
			4	To develop skill for making decisions in an organization
			5	To understand the hr functions
			6	To learn the different types of leadership qualities

S6	Ce362	Ground improvement techniques	1	An understanding about types of ground improvement techniques and soil distribution in india
			2	Knowledge about various types of grouts and its applications
			3	Knowledge about types of chemical stabilization and their construction methods
			4	Understanding about ground anchors, rock bolts, and soil nailing

			5	Knowledge about compaction of soil
			6	Understanding about various methods of dewatering of soil
S6	Ce 366	Traffic engg & management	1	Estimate basic characteristics of traffic stream
			2	Conduct traffic studies
			3	Design traffic signal systems
			4	Determine the capacity of highways
			5	Analyze traffic data
			6	Study about traffic flow characteristics
S6	Ce374	Air quality management	1	Understands the basics of air ollution roblems
			2	An abilityto know how the air pollutants affects on environment and ecosystem
			3	Basic knowledge on various asects of air pollutants
			4	Create an awareness regarding the disersion of air pollutants
			5	Knowledge on air quality monitoring and air quality standards
			6	Understans the various techniques that can be adoted for manging air ollution related roblems
S6	Ce332	Transportation engineering lab	1	Students will be able to assess quality of pavement materials
			2	Able to conduct various tests on aggregate used for road construction
			3	Able to conduct various tests on bitumen used for road construction
			4	Students will understand various qulaity standards for materials used for road construction
			5	Students will be able to do different quality control tests
			6	Students will be able to do different types of mix design
S6	Ce334	Computer aided civil engineering lab	1	Students will be able to read as well as prepare structural drawings indicating reinforcement details as per is codes
			2	Students will be able to model analyse and design structural elements like rcc beams, frames and steel truss using any software
			3	Students will be able to understand common terms used in construction industry and to use a project management software for a given set of activities
			4	Students will be able to acquire skills for carrying out detailed survey of a terrain of limited extent, to collect

				topographical features for planning and execution of civil engineering projects
			5	Survey camp enables the students to work in harmony within a group to achieve a given target within limited time and source, by proper planning and incorporating scheduling division of work communication and managerial skills
			6	

S6	Ce352	Comprehensive exam	1	Students will be able to understand the basic concepts of subjects studied upto semester 5
			2	Students can face the interviews with confidence
			3	Students will be able to think and study the practical application of theory they studied
			4	Understand the importance of confidence and knowledge in answering an interview
			5	Understand the relation between theory and practice
			6	Understood the need & requirements of industrial experience

S7	Ce401	Design of steel structures	1	Ability to design bolted and weldded connections
			2	Ability to design tension members
			3	Ability to design compression members
			4	Ability to design beams and palte girders
			5	Ability to design and analyse truss members
			6	Familiarisation an design of timbers members

S7	Ce403	Structural analysis- iii	1	Analyse structures using approximate method
			2	Analyse structures using matrix method
			3	Analyse trusses, continuous beams and rigid frames using flexibility method
			4	Analyse trusses, continuous beams and rigid frames by stiffness method
			5	Conceive finite element procedures by direct stiffness method
			6	Use the basics of structural dynamics and analyse the response of sdof systems

S7	Ce405	Environmental engineering- i i	1	To quantify the water required by the community considering various needs.
			2	To understand the basic characteristics of drinking water.
			3	To expose the basic design of water treatment units.
			4	To explain the mechanisms and operation of filters.
			5	To describe the mechanisms of disinfection and removal of dissolved compounds.

			6	To provide the adequate knowledge about the water distribution system.

S7	Ce407	Transportation engineering -ii	1	To enable the students to obtain the knowledge of the latest tecnology in design construction and maintenance of railway
			2	To develop an indepth knowledge of operation & control of railway physical features
			3	To develop a knowledge about basic design of railway features
			4	Apply basic concepts of harbour engineering
			5	Learn basic concept of dock and dredging
			6	Provide a sound knowledge of various modes of sustainable transport

S7	Ce409	Quantity surveying and valuation	1	Student will be able to prepare specification for using materials of construction and its items of works
			2	Student will be able to illustrate a detailed estimation of material consumption and abstracts for entire construction projects
			3	Student will learn how to analyze the rates for different items of works including labor and material.
			4	Interpret fundamental concepts of valuation
			5	Students will be able to identify various legal issues related to construction
			6	Student will have knowledge about building construction and material details
S7	Ce463	Bridge engineering	1	Students will get a fundamental knowledge on bridge engineering
			2	Understands the specifications for road bridges
			3	Students will be able to design solid slab bridges and box culverts
			4	Develop knowledge on designing of beam and slab bridges
			5	Able to design and check the stability of piers and abutments
			6	Understands the design of bearings and detail bridge foundations

S7	Ce467	Highway pavement design	1	Understand various taffic environmental and material characteristics influencing pavement behaviour
			2	Attain competency in standard practice of design of flexible pavements to construct bituminous roads
			3	Apreciate and follow the knowledge of design of rigid pavements to construct concrete roads

			4	Apreciate and follow the concept of temperature stresses, and design joints, dowel bars and tie bars in concrete pavements
			5	Recogonise the types of pavement distress and analyze the factors which influence pavement performance, evaluate the condition of pavement and strengthen existing pavements
			6	Develop basic understanding of principles of pavement management

S7	Ce469	Environmental impact assessment	1	To describe the environmental imbalances, indicators and explain the concept of eia
			2	To identify and describe elements to be affected by the proposed developments and/or likely to cause adverse impacts to the proposed project, including natural and man-made environment;
			3	To assess the impacts of various development on environment
			4	To summarise the methodologies for carrying out environmental impact assessment
			5	Applicataion of methodologies
			6	To gain knowledge on eia case studies

	Ce451	Seminar & project preliminary 0	1	Students will be able to apply engineering knowledge in practical problem solving
			2	Think innovatively on the development of components, products, processes or technologies in the engineering field,involving team work
			3	Develop creative thinking in finding viable solutions to engineering problems
			4	Apply knowledge gained in solving real life engineering problems
			5	Students will improve their presentation skills, conference presentation/publication in journal
			6	Students will improve their technical writing skills, publication in journal & report in standard format

S7	Ce431	Environmental engineering lab	1	To analyze the range of ph for assessing its potability
			2	To determine the dissolved oxygen of a gven water forchecking its potability
			3	To determine available chlorine in a sample of bleaching powder
			4	To analyse the various types of solids in a given water sample
			5	To determine organic matter of a given wastewater sample
			6	To determine the mpn in a water and assess the suitability for potability

S8	Ce402	Environmental engineering ii	1	To quantify the water required by the community considering various needs.
			2	To understand the basic characteristics of drinking water.
			3	To expose the basic design of water treatment units.
			4	To explain the mechanisms and operation of filters.
			5	To describe the mechanisms of disinfection and removal of dissolved compounds.
			6	To provide the adequate knowledge about the water distribution system.

S8	Ce404	Civil engineering project management	1	To impart knowledge on basic principles and planning and scheduling construction projects.
			2	To understand optimisation tools and codification basics
			3	To study the legal handling of issues of construction projects and to emphasis cost aspects
			4	To promote the ethical considerations and to learn computerisation requirements
			5	Emphasis material management and educate on safety practises in construction
			6	Familiarise contracting procedures and understand quality issues and quality management

S8	Ce464	Reinforced soil structures and geosynthetics	1	The students will understand the history and types of geosynthetics and their functions.
			2	Become aware of the situations where geosynthetics can be used.
			3	The students will understand the mechanism of reinforced soil.
			4	Ability to do design of reinforced soil retaining walls & reinforced earth beds.
			5	The students will understand the concept of bearing capacity improvement using soil reinforcement.
			6	Become aware of natural geotextiles and about design concepts of pvds

S8	Ce468	Structural dynamics and earthquake resistant design	1	An introduction to earthquake engineering &understand the basic characteristics of earthquake ground motions
			2	Understand the response to structural systems to earthquake excitation and select appropriate structural systems

			3	Understand the influence of building for in resisting earthquake
			4	Appreciate the importance of capacity design concept and ductility for earthquake resistant design
			5	To familiarise codal provisions for earthquake resistant structural design
			6	Apply concepts of repair and rehabilitation of earthquake affected structures

S8	Ce474	Municipal solid waste management	1	To create an awareness of different types of solid waste generated in our environment and their ill effects
			2	To create an idea about waste generation, methods of estimation of generation rate and composition of solid waste
			3	To study the various methods of collection system, transfer operation of solid wastes
			4	To study the various methods of processing of solid wastes
			5	To study the need of waste disposal and the various methods of disposal of solid waste
			6	To study about composting and its types

S8	Ce492	Project	1	Students will be able to apply engineering knowledge in practical problem solving
			2	Think innovatively on the development of components, products, processes or technologies in the engineering field,involving team work
			3	Develop creative thinking in finding viable solutions to engineering problems
			4	Apply knowledge gained in solving real life engineering problems
			5	Students will improve their presentation skills, conference presentation/publication in journal
			6	Students will improve their technical writing skills, publication in journal & report in standard format