SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA
Department of Civil Engineering

S3 CE

MA201	**Linear algebra and complex analysis**	**4**	**Ms Lickny I (AS)**

CO1	Demonstrate capacity for mathematical reasoning through analyzing, proving and explaining concepts from complex analysis.
CO2	Analyze Conformal mapping to change regions with complicated shapes into simpler ones.
CO3	Apply systems of linear equations to solve computational tasks including processing, designing, modeling and simulation.
CO4	CO4 The properties of eigenvalues are applied to simplify expensive calculations occurring in science and engineering

CE201	**Mechanics of Solids**	**4**	**Ms. Amrutha K**

CO1	Identify strength characteristic of a member subjected to axial load, bending, shear and torsion
CO2	Find the shear force and bending moment diagram for different support and loading conditions
CO3	Determine the principal and maximum shear stresses using equations and Mohr's circle
CO4	Solve the buckling problems of columns

HS210	**Life Skills**	**3**	**Ms. Amrutha K**

CO1	Improve the communication, problem solving skills and writing skills of prospective engineers
CO2	Convey thoughts and ideas thereby equipping them to face interviews and group discussions
CO3	Instill moral and social values, loyalty and to learn to appreciate the rights of others

CO4	Analyze a particular problem critically and obtain a solution by working in a group or team

CE203	**Fluid Mechanics**	**4**	**Ms Reshma Antony**

CO1	Discuss the principles of rigid body mechanics and concept of equilibrium
CO2	Identify applicable principles or theorems to solve problems of mechanics
CO3	Analyze the components of system of forces, applying properties of distributed areas and masses
CO4	Solve problems of rigid bodies in static and dynamic conditions

CE205	**Engineering Geology**	**4**	**Ms Sujana R**

CO1	Understand the significance and effects of weathering
CO2	Investigate the role of geological formations in the availability of subsurface water.
CO3	Discuss the characteristics of different rocks and constituent minerals.
CO4	Analyse the importance of geologic structures in construction.
CO5	Examine various natural disasters and management strategies.

CE 207	**Surveying**	**3**	**Ms Minu Ann Peter**

CO1	Understand the basic concept of surveying and familiarise the various instruments used for surveying
CO2	Solve the problems related to levelling
CO3	Identify the errors in surveying and apply corrections
CO4	Investigate the modern equipment of surveying

SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA
Department of Civil Engineering

CE 231	**CIVIL ENGINEERING DRAFTING LAB**	**1**	**Ms. Amrutha K**

CO1	To interpret different components of a building
CO2	To identify different rules and regulations for planning the buildings
CO3	To plan building drawings and to interpret the various drawings
CO4	To create Autocad Software knowledge

CE233	**Surveying Lab**	**1**	**Ms.Minnu Ann Peter**

CO1	Execute levelling using dumpy level
CO2	Execute surveying using theodolite and total station
CO3	Check the various equipment of surveying

S4 CE

MA 202	**Probability Distributions, Transforms and Numerical Methods**	**4**	**Ms. Lickny I**

CO1	Apply the concept of discrete and continuous probability distributions in Engineering and real life situations
CO2	Solve various equations occurring in Engineering by applying different Numerical techniques
CO3	Analyse the concepts of Fourier and Laplace transforms in interdisciplinary environments

SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA
Department of Civil Engineering

CE202	**Structural Analysis- I**	**4**	**Ms. Remya P M**

CO1	Analyse trusses and apply energy principles to study the displacement response of statically determinate structures
CO2	Apply unit load method and strain energy method to analyse trusses, beams and frames
CO3	Apply consistent deformation method to analyse statically indeterminate structures
CO4	Conceive the concept of Influence line diagrams to evaluate the moving loads
CO5	Analyse suspension bridges and arches and evaluate them

CE204	**Construction Technology**	**4**	**Ms. Amrutha K**

CO1	Understand Engineering properties and specifications of different construction materials
CO2	Study preparation of good quality concrete and its properties
CO3	Understand the construction of domestic as well as commercial building
CO4	Know the construction techniques of building components and its failures

CE206	**Fluid Mechanics- II**	**3**	**Ms. Reshma Antony**

CO1	To apply the fundamental theories of fluid mechanics for the analysis and design of hydraulic machines..
CO2	To understand the characteristics of various types of open channel flows and apply them to compute the length of water surface profiles.
CO3	To do the analysis of open channel flows & design of open channels.
CO4	To understand the basic modeling laws in fluid mechanics and dimensional analysis.

SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA

Department of Civil Engineering

CE208	**Geotechnical Engineering- I**	**3**	**Ms. Sujana R**

CO1	Analyse and Classify the soil based on various basic and index properties.
CO2	Understand the relation between soil properties, hydraulic condition of the soil and the stresses developed
CO3	To conduct various tests and to assess the strength and settlement characteristics of soil.
CO4	Evaluate the stability of slopes

HS200	**Business Economics**	**3**	**Viniminesh valsan**

CO1	To examine economic decision making,efficient allocation and utilisation of scarce resources and the scope of managerial economics.
CO2	To analyse market demand and supply,production techniques,calculation of costs,fixing the equilibrium price,investments returns,profitability of firms and to determine the price under various market situations.
CO3	To evaluate the functioning of an economy with national income,money supply,trade cycles and credit control methods by RBI.
CO4	To construct balance sheet,profitability index,its interpretation,capital budgeting and cost benefit analysis.

CE232	**Materials Testing Lab I**	**1**	**Ms. Remya P M & Ms. Vasudha V**

CO1	Evaluate strength of materials under imposed loads
CO2	Evaluate the ability of a material to be used as building materials and prepare reports based on the same
CO3	Work as an individual and as a member in a group
CO4	Apply the norms provided in Indian standard codes while evaluating materials

CE234	Fluid Mechanics Lab	1	Ms. Reshma Antony

CO1	To understand the different flow measurement equipment and their calibration procedures.
CO2	To analyze the performance characteristics pumps/turbines.
CO3	To develop the skill of experimentation techniques for the study of flow phenomena in channels/pipes.
CO4	To understand the parameters of Hydraulic Jump in Open channel Flow.

S5 CE

CE301	Design of Concrete Structures I	4	Ms. Minu Ann Peter

CO1	Understand the basic concepts of working stress and limit state method
CO2	Comprehend the IS code provisions for the design of structural elements
CO3	Design the structural elements such as beams and slabs with proper detailing
CO4	Design stairs and columns as per the IS code recommendations

CE303	Structural Analysis II	3	Ms Remya P M

CO1	Understand the theory behind force and displacement methods of analyses and hence analyse structures using force method
CO2	Analyse structures using displacement method such as Slope deflection method, moment distribution method, Kani's method etc.
CO3	Analyse curved beams and estimate their maximum bending moments
CO4	Apply plastic theory to analyse structures to arrive at optimised structures

SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA

Department of Civil Engineering

CE 305	**Geo-Technical Engineering II**	**3**	**Ms. Sujana R**

CO1	Calculate the stresses in soil under different types of loading.
CO2	IInvestigate into the lateral earth pressure based on different theories.
CO3	Understand the detailed design aspects of various types of foundations
CO4	Investigate soil parameters.

CE 307	**Geomatics**	**3**	**Ms. Ragi C Ravindran**

CO1	Investigate the methods of traversing and balancing the traverse
CO2	Differentiate between the simple, compound and transition curves
CO3	Understand the basic concept of GPS and to distinguish the GPS surveying methods
CO4	Possess knowledge on Remote Sensing and GIS

CE309	**Water Resources Engineering**	**3**	**Mr. Jithin David**

CO1	Identify various parameters influencing hydrology & to learn methods to quantify the rainfall data.
CO2	Create awareness about requirements of irrigation
CO3	Discuss the features of surface water and stream flow
CO4	Examine the various features of ground water hydrology

CE 371	**ENVIRONMENT AND POLLUTION**	**3**	**Mr. Sunny C P**

CO1	To Have basic knowledge of Environment and various pollution sources and their effects
CO2	To Understand Air pollution and its effect on human, vegetation and environment
CO3	To Remedy Water pollution and ways to maintain water quality

CO4	To Identify Solid waste and methods to recycle and reuse
CO5	To Know land pollution and noise pollution abate measures for life sustenance.

CE341	**Design Project**	**2**	**Ms. Amrutha K**

CO1	Identify and solve technical problems in Civil Engineering
CO2	Think innovatively on the development of components, products, processes or technologies in the engineering field
CO3	Analyze the problem requirements and arrive at workable design solutions
CO4	Encourage work in a group and improve the presentation and communication skill of a student

CE331	**Material Testing Lab II**	**1**	**Ms. Remya P M**

CO1	Integrate the hands on experience on material testing with their theoretical understanding of mechanical behaviour of materials
CO2	Prepare reports and present the results based on the test data complying with BIS codes/regulations
CO3	Refer codes and other reference materials for standard property data
CO4	Interpret the results and recommend the suitability of a material for a given load case.

CE333	**Geotechnical Engineering Lab**	**1**	**Ms. Sujana** **Ms. Ragi C Ravindran**

CO1	Determine the compaction characteristics required for field application
CO2	Evaluate settlement characteristics of soils
CO3	Assess permeability and shear strength of soils
CO4	Find out the index and engineering properties and to classify the soils

SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA
Department of Civil Engineering

S6 CE

CE302	Design of Hydraulic Structures	**4**	**Sunny C P**

CO1	Perform the stability analysis of hydraulic structures based on different theories
CO2	Evaluate the causes of failure of different types of dams and their design criteria
CO3	Design minor irrigation structures such as regulators, cross drainage works and canal falls
CO4	Prepare working drawings for lifelong applications

CE304	**Design of Concrete Structures II**	**3**	**Dr. Zacharia Varghese**

CO1	Design eccentrically loaded short columns and slender columns using SP:16 design charts.
CO2	Design earth retaining walls and design different types of footings for columns .
CO3	Design rectangular and circular water tanks using IS:3370 code coefficients and design circular slabs and domes.
CO4	Analyse prestressed concrete beams and estimate the loss in prestress.

CE306	**Computer Programming and Computational Techniques**	**3**	**Ms. Anusree K**

CO1	Understand Basic Concepts of Programming
CO2	Analyze basic engineering problems and design programs with C++ features
CO3	Examine various computational methods and their implementation
CO4	Implement numerical techniques for solving problems using C++ language

SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA
Department of Civil Engineering

CE308	**Transportation Engineering- I**	**3**	**Ms. Ragi C Ravindran**

CO1	Design various geometric elements of a highway
CO2	Comprehend the desirable properties of highway pavement materials
CO3	Design isolated signals by Webster's method
CO4	Plan and design basic airport facilities such as runway orientation, basic runway length, taxiways and aprons

CE366	**Traffic Engineering and Management**	**3**	**Mr. Vasudevan N.**

CO1	To understand various traffic management measures and traffic regulations.
CO2	To understand the concepts of Highway Capacity and level of service.
CO3	To identify and analyze various types of road intersections and to design the traffic signals.
CO4	Brief exposure to traffic safety aspects and basic concepts of traffic flow theory.

HS300	**Principles of Management**	**3**	**Ms. Remya P M**

CO1	Develop ability to critically analyse and evaluate a variety of management practices in the contemporary context
CO2	Understand and apply a variety of management and organisational theories in practice
CO3	Able to mirror existing practices or to generate their own innovative management competencies, required for today's complex and global workplace
CO4	Critically reflect on ethical theories and social responsibility ideologies to create sustainable organisations

SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA
Department of Civil Engineering

CE332	**Transportation Engineering Lab**	**1**	**Mr. Jithin David, Ms. Sujana R**

CO1	Evaluate the strength of subgrade soil.
CO2	Assess the strength and stability properties of coarse aggregate.
CO3	Investigate the suitability of the aggregate in road construction based on various shape tests
CO4	Estimate the grade and stability of bitumen.

CE334	**Computer Aided Civil Engineering Lab**	**1**	**Ms. Amrutha K, Ms.Aiswarya M S**

CO1	The students will be able to accomplish the skills for the use of Civil Engineering Drafting Software
CO2	The students will be able to familiarize with the software packages for analysis and Design of structures
CO3	The students will be able to enable the usage of Project Management Software
CO4	The students will be able to understand the Total Station data transfer and interpretation

CE352	**Comprehensive Exam**	**2**	**Mr. Sunny C P, Mr. Vasudevan N**

CO1	Students will be able to gain a thorough knowledge of concepts learnt in lower semesters
CO2	Students will be able to gain confidence in facing technical interviews
CO3	Students will be able to gain confidence to take up competitive exams

SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA
Department of Civil Engineering

S7 CE

CE 401	**Design of Steel Structures**	**4**	**Dr Zacharia Varghese**

CO1	Design structural steel connections and members subjected to tension.
CO2	Design steel girders – simple and compound beams, and plate girders.
CO3	Design axially loaded solid and built up columns and column bases.
CO4	Carry out analysis and design of structural steel roof trusses, purlins, bracings etc.
CO 5	Design of structural components using timber.

CE 403	**Structural Analysis III**	**3**	**Ms. Remya P M**

CO1	Analyse structures using approximate method
CO2	Analyse trusses, continuous beams and rigid frames using flexibility method
CO3	Apply Stiffness method to analyse trusses, continuous beams and rigid frames
CO4	Conceive Finite element procedures by direct stiffness method
CO5	Apply the basics of structural dynamics and analyse the response of SDOF systems

CE405	**Environmental Engineering I**	**3**	**Ms. Vasudha V**

CO1	To understand the significance of water demand
CO2	To analyze water quality parameters with reference to water quality standards
CO3	To learn different treatment units and it's design considerations
CO4	To understand the significance of various treatment techniques

CO 5	To understand various methods of water distribution systems

CE 407	**Transportation Engineering II**	**3**	**Ms. Ragi C Ravindran**

CO1	Understand the significance of railways
CO2	Design the geometric elements of railway track
CO3	Investigate the operation, control and maintenance of railway
CO4	Design a tunnel
CO 5	Understand the significance of dock and harbour

CE409	**Quantity Survey and Valuation**	**3**	**Mr. Sunny C P**

CO1	To know the need, type, specifications, method of measurements and knowledge of CPWD data and rates
CO2	To Work out rates of various items of works
CO3	To Prepare detailed, abstract estimate and bar bending schedule for various types of civil infrastructures
CO4	To Validation of real and landed properties
CO 5	To Prepare the schedule of programming of the project and manage any civil engineering project confidently either alone of jointly.

CE469	**Environmental Impact Assessment**	**3**	**Mr. Devis P C**

CO1	Have an understanding on Air and Water pollution and their effects on the environment.
CO2	Have an understanding about solid waste management-,its classification handling and disposal.s effects

CO3	To have knowledge of various tools and techniques related to Environmental Impact Assessment
CO4	Have an understanding of the impacts of pollutants and Global Environmental issues

CE431	**Environmental Engineering Lab**	**1**	**Mr. Devis P C & Ms. Vasudha V**

CO1	To equip the students in doing analysis of water samples
CO2	To equip the students to access quality parameters of water according to various standards
CO3	To equip the students in doing analysis of waste water samples

CE451	**Seminar and Project Preliminary**	**2**	**Dr. Zacharia Varghese, Mr. Jithin David**

Project

CO1	Identify areas of development in Civil Engineering and propose methods for improvement.
CO2	Propose methods and plans for solving existing problems in the field of Civil Engineering
CO3	Develop skills to improve team spirit and leadership
CO4	Develop skills to synthesize and present data in an effective manner

S8 CE

CE402	**Environmental engineering II**	**1**	**Devis P C**

CO1	Have an understanding of Domestic Waste water sources, Quantification & quality of Municipal waste water
CO2	Have an understating of Sewerage systems and Design of sewers
CO3	Have an understanding of the various types of treatment methods for wastewate**r**
CO4	Know the design aspects of various treatment units in wastewater treatment plant

CE404	**Civil Engineering Project Management**	**3**	**Aiswarya M S**

CO1	Students will be able to plan and schedule a construction project.
CO2	Students will be able to apply principles of ethics in decision making
CO3	Students will be able to familiarize with project cost, budget and the legal procedures in construction contracts
CO4	Students will be able to understand different quality and safety management practices in construction

CE474	**MUNICIPAL SOLID WASTE MANAGEMENT**	**3**	**Ms.Vasudha V**

CO1	To understand various types of waste and it's characteristics and waste generation methods
CO2	To learn about the collection and processing techniques in waste management.
CO3	To learn about various disposal techniques in waste management.
CO4	To give an overview on various composting methods and anaerobic processes involved in waste management

CE492	**Project**	**6**	**Dr. Zacharia Varghese and Mr. Jithin David**

CO1	Identify areas of development in Civil Engineering and propose methods for improvement.

CO2	Propose methods and plans for solving existing problems in the field of Civil Engineering
CO3	Develop skills to improve team spirit and leadership
CO4	Develop skills to synthesize and present data in an effective manner