



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Mauje: Khamshet, Pune-Mumbai Highway(NH4), Tal:Maival, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

Civil Engineering Department

Program Specific Outcomes (PSOs)

| | |
|-------|--|
| PSO 1 | Apply knowledge in analysis, design, survey, testing and construction of civil engineering structures along with knowledge of mathematics, basic science and soft skill to solve complex Civil Engineering problems. |
| PSO 2 | Understand economic, environmental, societal, health and safety factors involved in Civil Engineering. |
| PSO 3 | Develop skill for continuous self-learning and research in civil engineering to fulfill the needs of society, ethically. |

Program Outcome (POs)

| | |
|------|---|
| PO 1 | Engineering Knowledge – Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solutions of complex problems. |
| PO 2 | Problem Analysis – Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. |
| PO 3 | Design/Development of solutions – Design solutions for complex engineering problems and design system components or processes that meet the specified need with appropriate considerations for public health and safety, and the cultural, societal, and environmental considerations. |
| PO 4 | Conduct investigation of complex problems – Used research based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusion. |
| PO 5 | Modern tool usage – Create, select and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of limitations. |
| PO 6 | The engineer and society – Apply reasoning informed by the contextual knowledge to assess societal, health, safety legal and cultural issues and consequent responsibilities relevant to professional engineering practice. |
| PO 7 | Environment and Sustainability – Understand the impact of professional engineering solutions in societal and environmental |



| | |
|-------|--|
| | contexts, and demonstrate the knowledge of, and need of sustainable development. |
| PO 8 | Ethics- Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice. |
| PO 9 | Individual and Team work – Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings. |
| PO 10 | Communication – Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentation, give and receive clear instructions. |
| PO 11 | Project Management and Finance – Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments. |
| PO 12 | Life Long Learning – Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadcast context of technological change. |

**Course Outcomes: Students should be able to
First Year (FE) Civil Engineering (Curriculum 2015 Pattern)
Semester-I**

| | |
|-----------------------------|--|
| Subject | Engineering Mathematics -I |
| Subject Code | CE 101 (107001) |
| Course Outcome (COs) | |
| CE 101.1 | Understand the concepts of matrices that serve as an essential basis for several computational techniques. |
| CE 101.2 | Understand and solve algebraic and transcendental equations. |
| CE 101.3 | Acquire the knowledge of infinite series, Taylor series & Malaren's series, Understand and determine the convergence of series |
| CE 101.4 | Apply the knowledge of series expansions of functions |



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Maaje: Khamshet, Pune-Mumbai Highway(NH4), Tal:Maval, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

| | |
|----------|---|
| CE 101.5 | Prove the results of partial differentiation. Apply partial differentiation for evaluating and proving the results. |
| CE 101.6 | Apply Jacobian for evaluating and proving the results based on Errors and approximations, Maxima and minima. |

| | |
|-----------------------------|---|
| Subject | Engineering Physics |
| Subject Code | CE102 (107002) |
| Course Outcome (COs) | |
| CE102.1 | Students are enabled to derive the diffraction grating formula. |
| CE102.2 | Students are capable to Calculate the reverberation time of a room and suggest how to design a room with optimal reverberation time |
| CE102.3 | Students will be able to explain working principle of lasers. |
| CE102.4 | Ability to estimate the charge carrier mobility and density in intrinsic & extrinsic Semiconductor, PN Junction diode |
| CE102.5 | Students are capable to calculate the wavelength of a particle as a function of its momentum. |
| CE102.6 | Ability to explain different methods of growth and synthesis of nano particles and its application in Engineering. |

| | |
|-----------------------------|---|
| Subject | Engineering Graphics I |
| Subject Code | CE 103(102006) |
| Course Outcome (COs) | |
| CE 103.1 | Students will be able to develop the manual drawing skill, drawing interpretation skill. |
| CE 103.2 | Students will be able to develop the physical realization of the dimension & views of the objects. |
| CE 103.3 | Student will be able to develop imagination of Physical Objects to be represented on paper for Engineering Communication. |

| | |
|---------------------|-------------------------------------|
| Subject | Basic Electrical Engineering |
| Subject Code | CE 104(103004) |



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Mauje: Khamshet, Pune-Mumbai Highway(NH4), Tal:Maval, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

| Course Outcome (COs) | |
|-----------------------------|--|
| CE104.1 | Relation between Voltage and Current. |
| CE104.2 | Energy conversions. |
| CE104.3 | Direction of Induced emf. |
| CE104.4 | Transform of energy. |
| CE104.5 | Understanding of a pure parameter. |
| CE104.6 | Concept of three phase supply. |
| CE104.7 | Response of element is identical with various sources. |

| | | |
|-----------------------------|---|--|
| Subject | Basic Civil & Environmental Engineering | |
| Subject Code | CE 105(101005) | |
| Course Outcome (COs) | | |
| CE105.1 | Understand the scientific terminologies related to civil engineering. | |
| CE105.2 | Familiarize with different components, equipment and technical of civil engineering materials of construction | |
| CE105.3 | Describe the structure and function of an ecosystem. | |
| CE105.4 | Explains the concept of built environment and its importance | |
| CE105.5 | Explain the causes, effects and control measures of various types of pollutions. | |

| | | |
|-----------------------------|---|--|
| Subject | Fundamental of programming language -I | |
| Subject Code | CE 106(110003) | |
| Course Outcome (COs) | | |
| CE106.1 | To learn & acquire art of computer programming. | |



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Mauje: Khamshet, Pune-Mumbai Highway(NH4), Tal:Maval, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

| | |
|---------|--|
| CE106.2 | To know about some popular programming language and how to choose a programming language for solving a problem using a computer. |
| CE106.3 | To learn basics of Programming in C |

| | |
|-----------------------------|---|
| Subject | Workshop Practice |
| Subject Code | CE 107(102006) |
| Course Outcome (COs) | |
| CE107.1 | Introduction to different material in engineering practices with respect to their workability, formability & machinability with hand tools & power & to develop skills through hands on experience. |

Semester-II

| | |
|-----------------------------|--|
| Subject | Engineering Mathematics II |
| Subject Code | CE 108(107008) |
| Course Outcome (COs) | |
| CE108.1 | Solve the differential equations by choosing proper method of solution. |
| CE108.2 | Solve the problems on orthogonal trajectories, simple electrical circuits, and heat flow by applying the methods of Ordinary differential Equations. |
| CE108.3 | Apply the properties of special functions to evaluate integral. |
| CE108.4 | Apply the properties of special functions to evaluate integral. Sketch the curve with full justification. |
| CE108.5 | Demonstrate knowledge and understanding of plane and solid geometry & use geometrical skills to solve simple real-world problems |
| CE108.6 | Evaluate double integral and change the order of the integration. Evaluate area bounded between two curves, mass of Lamina, moment of inertia. |



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Mauje: Khamshet, Pune-Mumbai Highway(NH4), Tal:Maval, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

| | |
|-----------------------------|---|
| Subject | Engineering Chemistry |
| Subject Code | CE 109(107009) |
| Course Outcome (COs) | |
| CE 109.1 | Technology involved in improving quality of water for its industrial use. |
| CE 109.2 | Basic concepts of electro analytical techniques that facilitate rapid and reliable measurements. |
| CE 109.3 | Chemical structure of polymers and its effect on their various properties when used as engineering materials. To lay foundation for application the applications of polymers for specific applications and as composite materials. |
| CE 109.4 | Study of fossil fuel and derived fuels with its properties and applications. |
| CE 109.5 | An insight into carbon and hydrogen compounds with aspects of modern chemistry. |
| CE 109.6 | The principles of chemical and electrochemical reactions causing corrosion and methods used for minimizing the corrosion. |

| | |
|-----------------------------|---|
| Subject | Basic Mechanical Engineering |
| Subject Code | CE 110(102013) |
| Course Outcome (COs) | |
| CE110.1 | This Course will help the students to acquire knowledge of mechanical engineering. |
| CE110.2 | Describe the scope of mechanical engineering with multidisciplinary industries. |
| CE110.3 | Understand & identify common machine element with their functions & power transmission devices. |
| CE110.4 | Learn conventional machine tools & understand the concept of design in mechanical engineering. |
| CE 110.5 | Impart knowledge of basic concept of thermodynamics applied to industrial applications. |
| CE 110.6 | Understand lying principles of energy conversion system & power plant. |

| | |
|----------------|------------------------------|
| Subject | Engineering Mechanics |
|----------------|------------------------------|



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Mauje: Khamshet, Pune-Mumbai Highway(NH4), Tal:Maval, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

| | |
|-----------------------------|---|
| Subject Code | CE 111(101011) |
| Course Outcome (COs) | |
| CE111.1 | Apply fundamental knowledge of mathematics, science, and engineering. |
| CE111.2 | Design and conduct mechanics experiments. |
| CE111.3 | Analyze and interpret experimental and computational mechanics data |
| CE111.4 | Design a system, component or process to meet desired needs by synergistically combining mechanics of materials, fluid mechanics, and dynamics, when necessary. |
| CE111.5 | Identify, formulate, and solve engineering problems involving mechanics of rigid bodies. |
| CE111.6 | Effectively function as a member of multi-disciplinary technical team and engage in life-long learning. |

| | |
|-----------------------------|--|
| Subject | Basic Electronics Engineering |
| Subject Code | CE 112(104012) |
| Course Outcome (COs) | |
| CE 112.1 | Get knowledge of some basic electronic components and circuits |
| CE 112.2 | Understand basics of diodes and transistor circuits |
| CE 112.3 | Understand working of some IC based circuits |
| CE 112.4 | Analyze the logic gates and their usage in digital circuits |
| CE 112.5 | Expose the students to working of some power electronics devices, transducers and application of transducers |
| CE 112.6 | Understand the basic aspect of electronic communication systems |

| | |
|---------------------|--|
| Subject | Fundamental of programming language -II |
| Subject Code | CE 113(110010) |



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Mauje: Khamshet, Pune-Mumbai Highway(NH4), Tal:Maval, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

| Course Outcome (COs) | |
|-----------------------------|--|
| CE113.1 | To learn & acquire art of computer programming. |
| CE113.2 | To know about some popular programming language and how to choose a programming language for solving a problem using a computer. |
| CE113.3 | To learn basics of Programming in C , Advanced Programming. |

| Subject | Engineering Graphics II |
|-----------------------------|--|
| Subject Code | CE 114(102006) |
| Course Outcome (COs) | |
| CE114.1 | Students will be able to develop the computerized drawing skill, drawing interpretation skill. |
| CE114.2 | Students will be able to develop the physical realization of the dimension & views of the objects. |
| CE114.3 | Student will be able to develop imagination of Physical Objects to be represented on software. |

Semester-II

| Subject | Fluid Mechanics |
|-----------------------------|--|
| Subject Code | CE207(201004) |
| Course Outcome (COs) | |
| CE207.01 | Use fluid properties, dimensional analysis for solving problems of fluid flow. |
| CE207.02 | Solve fluid statics problems |



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Maaje: Khamshet, Pune-Mumbai Highway(NH4), Tal:Maval, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

| | |
|----------|---|
| CE207.03 | Measure fluid pressure. |
| CE207.04 | Calibrate discharge measuring instrument like venturimeter, orifice meter. |
| CE207.05 | Distinguish between various types of fluid flows and find the fluid velocity using principles of Kinematics and Dynamics. |
| CE207.06 | Design pipes to carry particular amount of discharge. |

| | |
|-----------------------------|--|
| Subject | Architectural Planning and Design of Building |
| Subject Code | CE208(201005) |
| Course Outcome (COs) | |
| CE208.01 | Make use of principles of planning and principles of architectural Planning |
| CE208.02 | Analyze the available primary or secondary data and plan different types of structures considering futuristic need of an area. |
| CE208.03 | Improve the status of existing structures by proposing appropriate green measures |
| CE208.04 | Plan effectively various types of buildings according to their utility with reference to different codes. |
| CE208.05 | Understand and resolve contemporary issues at multi-dimensional functional levels. |

| | |
|-----------------------------|-----------------------|
| Subject | Structural Analysis I |
| Subject Code | CE209(201008) |
| Course Outcome (COs) | |



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Maaje: Khamshet, Pune-Mumbai Highway(NH4), Tal:Maval, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

| | |
|----------|---|
| CE209.01 | Understand the basic concept of static and kinematic indeterminacy, slope and deflection of determinate and indeterminate beams for analysis of structures. |
| CE209.02 | Analyze indeterminate beams structures and frames. |
| CE209.03 | Evaluate determinate and indeterminate trusses and its application in the field. |
| CE209.04 | Apply influence line diagrams for the analysis of structures under moving load. |
| CE209.05 | Analyze two and three hinged arches and its application. |
| CE209.06 | Apply plastic analysis for indeterminate steel structures by limits state method. |

| | |
|-----------------------------|--|
| Subject | Engineering Geology |
| Subject Code | CE210(207009) |
| Course Outcome (COs) | |
| CE210.01 | Explain the basic concepts of engineering geology. |
| CE210.02 | Differentiate between the different rock types, their inherent characteristics and their application in civil engineering. |
| CE210.03 | Understand physical properties, mechanical properties of the minerals and their application in civil engineering |
| CE210.04 | Identify favorable and unfavorable conditions for the buildings, roads, dam, tunneling etc through the rocks. |
| CE210.05 | Explain mass wasting processes, effects of mass wasting process on the civil engineering structures and remedial measures. |
| CE210.06 | Interpret geohydrological characters of the rocks present at the foundations of the dams, percolation tanks, tunnels. |



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Mauje: Khamshet, Pune-Mumbai Highway(NH4), Tal:Maval, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

| | |
|----------|---|
| CE210.07 | Understand Seismic activities and its effect on the civil engineering construction. |
| CE210.08 | Identify geological hazards and presence of ground water. |

| | |
|-----------------------------|--|
| Subject | Concrete Technology |
| Subject Code | CE211(207007) |
| Course Outcome (COs) | |
| CE211.01 | Understand chemistry, properties, and classification of cement, fly ash, aggregates and admixtures, and hydration of cement in concrete. |
| CE211.02 | Prepare and test the fresh concrete |
| CE211.03 | Test hardened concrete with destructive and nondestructive testing instruments |
| CE211.04 | Get acquainted to concrete handling equipments and different special concrete types |
| CE211.05 | Design concrete mix of desired grade |
| CE211.06 | Predict deteriorations in concrete and repair it with appropriate methods and techniques. |



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Mauje: Khamshet, Pune-Mumbai Highway(NH4), Tal:Maival, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

| | |
|-----------------------------|--|
| Subject | Soft Skill |
| Subject Code | CE212 (201010) |
| Course Outcome (COs) | |
| CE 212.01 | To help the students in building interpersonal skills. |
| CE 212.02 | To develop skill to communicate clearly. |
| CE 212.03 | To enhance team building and time management skills. |
| CE 212.04 | To learn active listening and responding skills. |

| | |
|-----------------------------|---|
| Subject | Audit Course 2 Road Safety Management |
| Subject Code | |
| Course Outcome (COs) | |
| CE 213.01 | To provide basic overview on road safety & traffic management issues in view of the alarming increase in vehicular population of the country. |
| CE 213.02 | To explain the engineering & legislative measures for road safety. |



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Mauje: Khamshet, Pune-Mumbai Highway(NH4), Tal:Maval, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

CE 213.03

To discuss measures for improving road safety education levels among the public.

Course Outcomes: Students should be able to
Third Year Civil Engineering (TE) (Curriculum 2015 Pattern)
Semester-I

| | |
|-----------------------------|--|
| Subject | Hydrology and water resource engineering. |
| Subject Code | CE 301 (301001) |
| Course Outcome (COs) | |
| CE 301.01 | Build on the student's background in hydrology and hydraulics and understanding of water resources systems. |
| CE 301.02 | Understand the basic requirements of irrigation and various irrigation techniques, requirements of the crops |
| CE 301.03 | Develop skills in the ground water flow, type of aquifer and yield from the well |
| CE 301.04 | Knowledge about Runoff, Floods and estimation of future flood frequencies. |
| CE 301.05 | Knowledge of design of reservoir, operation and sedimentation |
| CE 301.06 | Knowledge of Water management and effects , causes and remedial measures of water logging and drainage. |



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Mauje: Khamshet, Pune-Mumbai Highway(NH4), Tal:Maval, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

| | |
|-----------------------------|--|
| Subject | Infrastructure Engineering and Construction Techniques |
| Subject Code | CE 302 (301002) |
| Course Outcome (COs) | |
| CE 302.01 | Understand the scope of Infrastructure in development and identify various components of railways. |
| CE 302.02 | Comprehend the amenities of rail track, its maintenance and development of railways. |
| CE 302.03 | Apply different construction techniques in underwater construction. |
| CE 302.04 | Understand types, methods of excavation, equipments used in tunneling under various rock structures. |
| CE 302.05 | Understand types, requirements, applications of docks, harbors and ports. |
| CE 302.06 | Identify and comprehend the application of various construction equipments. |

| | |
|-----------------------------|---------------------|
| Subject | Structural Design-I |
| Subject Code | CE 303 (301003) |
| Course Outcome (COs) | |



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Mauje: Khamshet, Pune-Mumbai Highway(NH4), Tal:Maval, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

| | |
|-----------|---|
| CE 303.01 | Knowledge of steel structure and understand various Indian Standard codes and its application and capable in design of tension member |
| CE 303.02 | Understand Buckling classification , design of strut and axially loaded column |
| CE 303.03 | Capable in design of column and column bases |
| CE 303.04 | Capable in design of laterally supported beam as per codal provision. |
| CE 303.05 | Capable in design of beam to beam connection and beam to column connection |
| CE 303.06 | Capable in design of Gantry Girder and roof truss |

| | |
|-----------------------------|--|
| Subject | Structural Analysis-II |
| Subject Code | CE 304 (301004) |
| Course Outcome (COs) | |
| CE 304.01 | Ability to idealized & analyze statically determinate and indeterminate structures by slope-deflection method. |
| CE 304.02 | Ability to analyze Beam & frame structures by moment distribution method. |
| CE 304.03 | Determine internal forces and reactions in determinate and indeterminate structures subjected to moving loads. |
| CE 304.04 | Ability to solve statically indeterminate structures using matrix (Stiffness) Method. |
| CE 304.05 | To determine deflection of beams & frames using central difference method or classical method. |
| CE 304.06 | Familiarity with Finite element structural engineering used for complex structures. |



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Mauje: Khamshet, Pune-Mumbai Highway(NH4), Tal:Maval, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

| | |
|-----------------------------|---|
| Subject | Fluid Mechanics II |
| Subject Code | CE 305 (301005) |
| Course Outcome (COs) | |
| CE 305.01 | Understand the Fluid Flow around Submerged Objects & Unsteady Flow |
| CE 305.02 | Understand the Open channel flow & its depth – energy relationship. |
| CE 305.03 | Understand the Uniform flow in open channels & concept of hydraulic jump & its phenomenon. |
| CE 305.04 | Understand the Force and work done due to impact of jet & centrifugal pumps principle & it's working. |
| CE 305.05 | Understand the Hydropower generation& Performance of hydraulic turbines |
| CE 305.06 | Understand the Gradually Varied Flow in Open Channels& its computations. |

| | |
|---------------------|----------------------------------|
| Subject | Employability Skills development |
| Subject Code | CE 306 (301006) |



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Mauje: Khamshet, Pune-Mumbai Highway(NH4), Tal:Maval, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

| Course Outcome (COs) | |
|-----------------------------|---|
| CE 306.01 | Development of Employability skills. |
| CE 306.02 | Development of Interpersonal skills. |
| CE 306.03 | Understand and development of Presentation skills. |
| CE 306.04 | To develop communication skills. |
| CE 306.05 | To make awareness of Commercial profession. |
| CE 306.06 | To develop Personal skills to work as leader and ability to work in a team. |

Semester-II

| | |
|-----------------------------|--|
| | Advanced Surveying |
| Subject | |
| Subject Code | CE 307 (301007) |
| Course Outcome (COs) | |
| CE 307.01 | Understand geodetic and triangulation surveying and apply SBPS in solving engineering problems |



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Mauje: Khamshet, Pune-Mumbai Highway(NH4), Tal: Maval, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

| | |
|-----------|--|
| CE 307.02 | Know objects, applications of Hydrographic Surveying. |
| CE 307.03 | Importance of Remote sensing and GIS, Apply GIS in solving engineering problems |
| CE 307.04 | Plan and execute triangulation survey, Know the triangulation adjustments, Identify and correct errors in field measurements |
| CE 307.05 | Make measurements on satellite images and aerial photographs using photogrammetric concepts |
| CE 307.06 | Know trigonometric leveling and setting out construction works. |

| | |
|-----------------------------|--|
| Subject | Project Management and Engineering Economics |
| Subject Code | CE 308 (301008) |
| Course Outcome (COs) | |
| CE 308.01 | Understand the importance and functions of management in construction industry. |
| CE 308.02 | Carryout scheduling and network analysis of construction projects.. |
| CE 308.03 | Understand management of materials and equipment and Safety norms. |
| CE 308.04 | Carryout resource allocation and acquire knowledge of soft ware's. |
| CE 308.05 | Understand economics of construction projects and its importance in decision making. |
| CE 308.06 | Study use of project appraisal report and understand the role of Project Management Consultant |

| | |
|----------------|------------------------|
| Subject | Foundation Engineering |
|----------------|------------------------|



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Mauje: Khamshet, Pune-Mumbai Highway(NH4), Tal:Maval, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

| | |
|-----------------------------|---|
| Subject Code | CE 309(301009) |
| Course Outcome (COs) | |
| CE 309.01 | Develop an understanding of the subsurface investigations for foundations. |
| CE 309.02 | Compute the bearing capacity. |
| CE 309.03 | Understand the concept of settlement and consolidation settlement. |
| CE 309.04 | To know the deep foundations and its types and suitability. |
| CE 309.05 | Understand the types of cofferdams and knowledge of properties of black cotton soils. |
| CE 309.06 | Develop an understanding of the soil reinforcement and earthquake geo-techniques. |

| | |
|-----------------------------|---|
| Subject | Structural Design-II |
| Subject Code | CE 310(301010) |
| Course Outcome (COs) | |
| CE 310.01 | Understanding of the concepts Working stress method, Ultimate load method and Limit state method. Design philosophy |
| CE 310.02 | Understanding principles of limit state design and design of singly and doubly reinforced beams and slab. |
| CE 310.03 | Design slab and staircase. |
| CE 310.04 | Design of flexural members |
| CE 310.05 | Analyze and design for shear, torsion bond and Redistribution of moments in continuous reinforced concrete beam |
| CE 310.06 | Design column and footing. |



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Mauje: Khamshet, Pune-Mumbai Highway(NH4), Tal:Maval, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

| | |
|-----------------------------|---|
| Subject | Environmental Engineering-I |
| Subject Code | CE 311(301011) |
| Course Outcome (COs) | |
| CE 311.01 | Explain sources, effects, preventive measures of noise pollution, air pollution and municipal solid waste. |
| CE 311.02 | Comprehend components of water supply scheme, appropriateness of water intake structures, quantity and quality of water. |
| CE 311.03 | Comprehend principles of water treatment, describe and design aeration fountain and sedimentation tanks. |
| CE 311.04 | Describe and design of Coagulation, Flocculation processes and Filtration. |
| CE 311.05 | Understand disinfection processes, water softening methods, demineralization, fluoridation and defluoridation. |
| CE 311.06 | Describe and design parts of water distribution systems and Rain water harvesting system and to understand the concept of packaged water treatment units. |

| | |
|-----------------------------|--|
| Subject | Seminar |
| Subject Code | 312(301012) |
| Course Outcome (COs) | |
| CE 312.01 | Analysis and comprehension of proof-of-concept and related data. |
| CE 312.02 | Establish motivation for any topic of interest and develop a thought process for technical presentation. |



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Mauje: Khamshet, Pune-Mumbai Highway(NH4), Tal:Maval, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

| | |
|-----------|--|
| CE 312.03 | Organize a detailed literature survey and build a document with respect to technical publications. |
| CE 312.04 | Make use of new and recent technology (e.g. Latex) for creating technical reports |
| CE 312.05 | Effective presentation and improve soft skills. |

Course Outcomes: Students should be able to
Final Year Civil Engineering (BE) (Curriculum 2012 Pattern)

| | |
|-----------------------------|---|
| Subject | Environmental Engineering II |
| Subject Code | CE401(401 001) |
| Course Outcome (COs) | |
| CE 401.01 | Determine the sewage characteristics and comprehend the quality and quantity of sewage. |
| CE 401.02 | Understand the process and component parts of waste water treatment. Also students can design screen chambers, grit chambers and primary settling tank. |
| CE 401.03 | Design secondary treatment units along with activated sludge process and trickling filters. |
| CE 401.04 | Comprehend the need, working principle and design of low cost treatment methods. |
| CE 401.05 | Understand the importance, merits and demerits of onsite sanitation and packaged sewage treatment units. |



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Mauje: Khamshet, Pune-Mumbai Highway(NH4), Tal:Maval, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

| | |
|-----------|---|
| CE 401.06 | Carry out risk assessment of waste water generated by Industries such as sugar, distillery etc and treatment technologies adopted by such industries. |
|-----------|---|

| | |
|-----------------------------|---|
| Subject | Transportation Engineering |
| Subject Code | CE402(401 002) |
| Course Outcome (COs) | |
| CE 402.01 | Understand the types of roads, various engineering surveys and traffic studies carried out for data collection for design of roads. |
| CE 402.02 | Design the geometric elements of roads |
| CE 402.03 | Acquire knowledge about the various road construction materials, their quality testing and design & construction of pavements |
| CE 402.04 | Understand the various concepts and terms related to Air Transportation System. |
| CE 402.05 | Acquire knowledge about components of bridges, data collection and design loads on Bridges. |
| CE 402.06 | Acquire knowledge about classification, construction and maintenance of Bridges |



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Maaje: Khamshet, Pune-Mumbai Highway(NH4), Tal:Maval, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

| | |
|-----------------------------|--|
| Subject | Structural Design and Drawing III |
| Subject Code | CE403(401 003) |
| Course Outcome (COs) | |
| CE 403.01 | Analyse a prestressed concrete beam accounting for losses also design the anchorage zone for post tensioned members |
| CE 403.02 | Analyse & design of vertical & horizontal shear in post tensioned prestressed concrete for flange section and the design of post tensioned slab. |
| CE 403.03 | Identify various methods of analysis and design for frame type structure under lateral and vertical loading condition. |
| CE 403.04 | Develop an appreciation of the design philosophy for deep excavation and retaining wall projects. |
| CE 403.05 | Design combined reinforced concrete foundation using both conventional approaches and elastic methods. |
| CE 403.06 | Design structural elements of a water retaining structure (Water tanks) for serviceability limit state of crack control and ultimate limit state |

| | |
|-----------------------------|--|
| Subject | Elective I- Architecture and Town Planning |
| Subject Code | CE404(401 004) |
| Course Outcome (COs) | |
| CE 404.01 | Understand concepts, theories, and practices of the discipline of architecture |



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Maaje: Khamshet, Pune-Mumbai Highway(NH4), Tal:Maval, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

| | |
|-----------|---|
| CE 404.02 | Acquire knowledge of urban quality of life with importance of sustainable planning with case study analysis |
| CE 404.03 | Acquire knowledge of different levels of town planning with detailed components of planning |
| CE 404.04 | Acquire knowledge of different civic services and role of planning agencies for various planning levels |
| CE 404.05 | Understand legislative mechanism of town planning |
| CE 404.06 | Acquire knowledge of technological applications in town planning |

| | |
|-----------------------------|---|
| Subject | Elective II -TQM & MIS in Civil Engineering |
| Subject Code | CE405(401 005) |
| Course Outcome (COs) | |
| CE 405.01 | Understand the concept of quality in construction and its importance |
| CE 405.02 | Understand the concept of MIS in construction and necessary support systems and resources |
| CE 405.03 | Understand the concept of Six Sigma in construction and its use to minimize the defects in construction |
| CE 405.04 | Understand the terminology of quality systems and documentation of QMS |
| CE 405.05 | Understand various MIS structures and cost of quality |
| CE 405.06 | Acquire knowledge of ERP software, GIS, GPS, Android subsystems for documentation and monitoring of construction projects |



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Mauje: Khamshet, Pune-Mumbai Highway(NH4), Tal:Maval, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

| | |
|-----------------------------|--|
| Subject | Project –I |
| Subject Code | CE 406(401006) |
| Course Outcome (COs) | |
| CE 406.01 | Identify, formulate and solve problems related to civil engineering. |
| CE 406.02 | Work in a group as a part of multidisciplinary team with professional responsibility |
| CE 406.03 | Analysis and design of structure to meet desired needs within realistic constraints. |
| CE 406.04 | Review literature and finalize problem statement. |
| CE 406.05 | Plan activity schedule and implementation in a given time span. |
| CE 406.06 | Prepare and present technical report. |
| CE 406.07 | Apply modern design and analysis tools. |

Semester-II

| | |
|----------------|-------------------------------|
| Subject | Dams and Hydraulic Structures |
|----------------|-------------------------------|



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Mauje: Khamshet, Pune-Mumbai Highway(NH4), Tal:Maval, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

| | |
|-----------------------------|---|
| Subject Code | CE 407(401007) |
| Course Outcome (COs) | |
| CE 407.01 | Understand the various types of dams and select a particular type considering technical, economic, environmental, climatic, topographic and social factors |
| CE 407.02 | Understand the importance of dam safety and instrumentation required to assess the health of dam. |
| CE 407.03 | Understand the construction & maintenance of gravity dam, earth dam, arch dam, buttress dam and Carry out stability analysis of gravity dam, earth dam & weir. |
| CE 407.04 | Acquire knowledge about components, classification, significance and selection of spillway, energy dissipating devices, spillway gates, diversion head works, canal, canal structures, cross drainage works and River training structures |
| CE 407.05 | Design of Ogee spillway, weir on permeable foundation, lined canal, cross drainage works. |
| CE 407.06 | Acquire knowledge about components, classification and layout of hydropower plants. |

| | |
|-----------------------------|--|
| Subject | Quantity Surveying, Contracts and Tenders |
| Subject Code | CE 408(401008) |
| Course Outcome (COs) | |
| CE 408.01 | Workout approximate estimates and understand terminology of estimation |



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Mauje: Khamshet, Pune-Mumbai Highway(NH4), Tal:Maval, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

| | |
|-----------|--|
| CE 408.02 | Taking out quantities & Detailed estimate up to plinth |
| CE 408.03 | Prepare detailed estimate for super structure, Understand the concept of Valuation and carryout valuation of real estate |
| CE 408.04 | Draft specifications for various items of work and carry out rate analysis for those items |
| CE 408.05 | Understand terminology of tendering and execution of works, draft tender notice for civil engineering works |
| CE 408.06 | Acquire knowledge about Contracts and Arbitration, draft conditions of contract |

| | |
|-----------------------------|--|
| Subject | Elective III- Air Pollution and control |
| Subject Code | CE 409(401009) |
| Course Outcome (COs) | |
| CE 409.01 | Understand meteorological aspects governing the air pollution. |
| CE 409.02 | Comprehend sampling and analysis of ambient air. |
| CE 409.03 | Describe and understand causes, sources, effects, measurement methods and control measures of indoor air pollution. |
| CE 409.04 | Understand various processes and equipments used for control of air pollution. |
| CE 409.05 | Understand economics of air pollution control and legislations used for air pollution control. |
| CE 409.06 | Comprehend methodology of environmental impact assessment and management and know environmental impacts of various industries. |



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Maaje: Khamshet, Pune-Mumbai Highway(NH4), Tal:Maval, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

| | |
|-----------------------------|---|
| Subject | Elective IV- Construction Management |
| Subject Code | CE 410 A(401 009) |
| Course Outcome (COs) | |
| CE 410A.01 | Understand the importance, applications and scope of construction management. |
| CE 410A.02 | Prepare the construction project schedule and apply the concept of work study. |
| CE 410A.03 | Understand the need, importance and provisions of some important labour laws associated with construction sector and acquire knowledge of financial aspects of construction projects. |
| CE 410A.04 | Analysis risk associated with construction project using some mathematical models, mitigation of project risks and understand concepts of value engineering. |
| CE 410A.05 | Acquire knowledge of various techniques of materials management and human resource management. |
| CE 410A.06 | Acquire knowledge about basic terminologies and applications of artificial intelligence technique in civil engineering |

| | |
|-----------------------------|--|
| Subject | Elective IV- Statistical Analysis and Computational Methods in Civil Engineering |
| Subject Code | CE 410 B(401 010) |
| Course Outcome (COs) | |
| CE 410B.01 | Apply some numerical methods for root finding. |
| CE 410B.02 | Understand various rules of numerical Integration and apply Gauss Quadrature method. |



Suman Ramesh Tulsiani Technical Campus

Faculty of Engineering

Mauje: Khamshet, Pune-Mumbai Highway(NH4), Tal:Maval, Dist: Pune- 410405

Approved By A.I.C.T.E. New Delhi, Recognized by Govt. of Maharashtra, Affiliated to University of Pune

| | |
|------------|--|
| CE 410B.03 | Apply optimization techniques |
| CE 410B.04 | Perform statistical analysis |
| CE 410B.05 | Calculate probability and understand probability distributions |
| CE 410B.06 | Perform correlation analysis and regression analysis |

| | |
|-----------------------------|--|
| Subject | Project – II |
| Subject Code | CE 411(401 011) |
| Course Outcome (COs) | |
| CE 410.01 | Identify, formulate and solve problems related to mechanical engineering. |
| CE 410.02 | Work in a group as a part of multidisciplinary team with professional responsibility |
| CE 410.03 | Analysis and design of structure to meet desired needs within realistic constraints. |
| CE 410.04 | Review literature and finalize problem statement. |
| CE 410.05 | Plan activity schedule and implementation in a given time span. |
| CE 410.06 | Prepare and present technical report. |
| CE 410.07 | Apply modern design and analysis tools. |