



# KIET GROUP OF INSTITUTIONS, DELHI – NCR, GHAZIABAD

## DEPARTMENT OF CIVIL ENGINEERING



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**

**Academic Session : 2019 - 2020 Semester : 3rd**

**Course Outcomes**

**Course Name : Fluid Mechanics, Course Code : KCE 303**

**After completion of this course, the student will be able to**

**CO-1:** Understand the broad principles of fluid statics, kinematics and dynamics

**CO-2:** Understand definitions of basic terms used in fluid mechanics

**CO-3:** Understand classifications of fluid flow.

**CO-4:** Apply the continuity, momentum and energy principles

**CO-5:** Apply dimensional analysis

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	2	1	1	-	-	-	-	1	-	-	1	-	-
CO-2	3	2	-	-	-	-	-	-	1	-	-	1	-	-
CO-3	3	2	-	-	-	-	-	-	1	-	-	1	-	-
CO-4	3	3	2	2	-	-	-	-	1	-	-	1	-	-
CO-5	3	2	2	2	-	-	-	-	1	1	-	1	-	-



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**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 3rd**

**Course Outcomes**  
**Course Name : Building Planning & Drawing Lab, Course Code : KCE 351**

**After completion of this course, the student will be able to**

**CO-1:** Apply the principles of planning and bye-laws (National building code) used for building planning

**CO-2:** Draft the plan, elevation and sectional views of the buildings using AutoCAD

**CO-PO Mapping**

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	-	1	-	-	2	1	3	1	1	-	1	-	-
CO-2	3	-	1	-	3	1	-	-	2	2	-	3	-	-



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Program : B.Tech (Civil Engineering)  
Academic Session : 2019 - 2020 Semester : 3rd  
Course Outcomes

Course Name : Surveying & Geomatics Lab, Course Code : KCE 352

After completion of this course, the student will be able to

**CO-1:** Demonstrate and handle various conventional surveying instruments such as chain/tape, compass, theodolite, auto-level in the field of civil engineering applications such as highway profiling, setting out curves etc.

**CO-2:** Measure distances, horizontal & vertical angles and coordinates using electronic total station.

**CO-3:** Apply the principles of photogrammetric surveying and take observations using mirror stereoscope and parallax bar.

**CO-4:** Measure coordinates using GPS and understand digitization using GIS and visual interpretation of standard FCC.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	3	3	2	2	1	-	1	3	2	-	-	-	-
CO-2	3	3	2	2	3	1	-	-	3	2	-	-	-	-
CO-3	3	3	3	1	2	1	-	-	3	2	-	-	-	-
CO-4	3	3	2	1	3	1	1	1	1	2	-	-	-	-



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**Program : B.Tech (Civil Engineering)**

**Academic Session : 2019 - 2020 Semester : 3rd**

**Course Outcomes**

**Course Name : Engineering Mechanics, Course Code : KCE 301**

**After completion of this course, the student will be able to**

**CO-1:** Use scalar and vector analytical techniques for analyzing forces in statically determinate structures.

**CO-2:** Apply fundamental concepts of kinematics and kinetics of particles to the analysis of simple, practical problems.

**CO-3:** Apply basic knowledge of mathematics and physics to solve real-world problems.

**CO-4:** Understand basic dynamics concepts – force, momentum, work and energy .

**CO-5:** Understand and be able to apply Newton's laws of motion.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	3	2	2	-	1	-	-	1	-	-	2	2	-
CO-2	3	3	2	2	-	-	-	-	1	-	-	2	2	-
CO-3	3	3	2	3	-	2	-	-	1	-	-	2	2	-
CO-4	3	3	2	3	-	1	-	-	1	-	-	2	2	-
CO-5	3	3	2	2	-	-	-	-	1	-	-	3	2	-



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**DEPARTMENT OF CIVIL ENGINEERING**



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**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 3rd**  
**Course Outcomes**

**Course Name : Fluid Mechanics Lab, Course Code : KCE 353**

**After completion of this course, the student will be able to**

**CO-1:** Evaluate Bernoulli's Theorem & Momentum equation in pipe flow.

**CO-2:** Apply continuity equation and flow visualisation in pipe flow.

**CO-3:** Verify the concept of buoyancy and hence metacentre point.

**CO-4:** Illustrate the concept of wind tunnel.

**CO-PO Mapping**

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	2	3	1	-	-	-	-	1	-	-	1	-	-
CO-2	3	2	3	1	-	-	-	-	1	-	-	1	-	-
CO-3	3	2	3	1	-	-	-	-	1	-	-	1	-	-
CO-4	3	2	3	1	2	-	-	-	1	-	-	1	-	-



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Academic Session : 2019 - 2020 Semester : 3rd  
Course Outcomes  
Course Name: Mathematics III, Course Code: KAS 303

After completion of this course, the student will be able to

**CO-1:** Learn the concept of Laplace transform and apply in solving real life problems.

**CO-2:** Evaluate the fourier integral of a function. They study the properties & applications of Fourier transformation, also explore the Z transform of a given function to find the solution of difference equation.

**CO-3:** Learn the concept of Formal Logic, Group and Rings to Rings to evaluate real life problems.

**CO-4:** Apply the concept of Set, Relation, function and Counting Techniques

**CO-5:** Apply the concept of Lattices and Boolean Algebra to create Logic Gates and Circuits, Truth Table, Boolean Functions.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	2	2	2	2	1	2	1	1	-	-	1	1	1
CO-2	3	3	3	2	1	1	2	1	1	-	-	-	1	1
CO-3	3	3	3	1	2	2	1	1	1	1	1	1	3	1
CO-4	3	2	3	1	1	2	2	2	1	1	1	1	3	1
CO-5	3	2	1	1	1	2	2	1	1	1	1	1	3	1



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**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 3rd**  
**Course Outcomes**  
**Course Name : Mini Project, Course Code : KCE 354**

**After completion of this course, the student will be able to**

**CO-1:** Understand a system, component or process to meet desired progress of project.

**CO-2:** Prepare Project Report for a project in Civil Engineering domain.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	3	3	3	2	2	2	2	3	2	3	2	3	3
CO-2	3	3	3	3	2	2	2	2	3	3	3	2	3	1



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**Academic Session : 2019 - 2020 Semester : 3rd**  
**Course Outcomes**  
**Course Name: Surveying & Geomatics, Course Code: KCE 302**

**After completion of this course, the student will be able to**

**CO-1:** Describe the function of surveying and work with survey instruments, take observations, and prepare plan, profile, and cross-section and perform calculations.

**CO-2:** Calculate, design and layout horizontal and vertical curves.

**CO-3:** Operate a total station and GPS to measure distance, angles, and to calculate differences in elevation. Reduce data for application in a geographic information system.

**CO-4:** Relate and apply principles of photogrammetry for surveying.

**CO-5:** Apply principles of Remote Sensing and Digital Image Processing for Civil Engineering problems.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	3	2	3	2	1	-	-	3	1	-	2	-	-
CO-2	3	3	2	3	2	2	-	-	2	1	-	2	-	-
CO-3	3	3	3	3	3	2	2	-	2	1	-	2	-	-
CO-4	3	3	3	3	2	1	1	-	2	1	-	2	-	-
CO-5	3	3	3	3	3	1	2	-	2	1	-	2	-	-





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**Academic Session : 2019 - 2020 Semester : 3rd**

**Course Outcomes**

**Course Name: Technical Communication, Course Code: KAS 301**

**After completion of this course, the student will be able to**

**CO-1:** Enable students understand the basics, process, level and flow of communication without barrier and enhance interpersonal skills of students.

**CO-2:** Make students learn and use principles of business communication and practice those in proper formats using appropriate structure in order to develop professional attitude among students.

**CO-3:** Make students explore and imbibe various nuances and ethics of delivery in presentation along with audio-visual aids and also learn to effectively work as an individual as well as in team.

**CO-4:** Enable students, appear in group discussion, interviews and various other activities at work place effectively with grammatical and socio-linguistic competence and appropriate verbal and non-verbal cues.

**CO-5:** Make student understand and imbibe voice-dynamics appropriately.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	-	-	-	-	-	1	-	1	3	3	2	2	-	-
CO-2	-	-	-	-	-	-	-	-	2	3	3	3	-	-
CO-3	-	-	-	-	-	1	-	-	2	3	2	3	-	-
CO-4	-	-	-	-	-	-	-	-	2	3	2	3	-	-
CO-5	-	-	-	-	-	-	-	-	3	3	2	3	-	-



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Program : B.Tech (Civil Engineering)

Academic Session : 2019 - 2020 Semester : 4th

Course Outcomes

Course Name : Energy Science and Engineering, Course Code : KOE 043

After completion of this course, the student will be able to

**CO-1:** Apply concepts of energy conversion in power cycles.

**CO-2:** Understand and apply the concepts of nuclear energy.

**CO-3:** Understand and apply the concepts of solar energy.

**CO-4:** Differentiate between conventional and non-conventional energy and elaborate about various energy sources.

**CO-5:** Apply concepts of energy audit for optimization of energy consumption.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
<b>CO-1</b>	3	2	1	-	-	1	1	-	1	1	-	1	-	-
<b>CO-2</b>	3	2	2	1	2	1	1	1	1	1	-	1	-	-
<b>CO-3</b>	3	2	2	1	2	1	1	1	1	1	-	1	-	-
<b>CO-4</b>	3	2	2	1	2	3	3	-	1	1	-	1	-	-
<b>CO-5</b>	3	1	-	-	2	3	3	2	1	1	-	1	-	-



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**Program : B.Tech (Civil Engineering)**

**Academic Session : 2019 - 2020 Semester : 4th**

**Course Outcomes**

**Course Name : Hydraulics & Hydraulic Machine Lab, Course Code : KCE 453**

**After completion of this course, the student will be able to**

**CO-1:** Investigate flow characteristics and various parameters for open channel

**CO-2:** Assess the performance of pumps and turbines.

**CO-PO Mapping**

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	3	3	2	-	2	2	-	1	-	-	-	-	-
CO-2	3	1	1	1	-	1	1	-	1	-	-	-	-	-



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**Program : B.Tech (Civil Engineering)**

**Academic Session : 2019 - 2020 Semester : 4th**

**Course Outcomes**

**Course Name : Human Values and Professional Ethics, Course Code : KVE 401**

**After completion of this course, the student will be able to**

**CO-1:** Understand the need, basic guidelines, content and process for Value Education with reference to Technical Education.

**CO-2:** Understand Harmony in the Human Being - Harmony in Myself.

**CO-3:** Understand Harmony in the Family and Society- Harmony in Human-Human Relationship.

**CO-4:** Understand Harmony in the Nature and Existence - Whole existence as Co-existence.

**CO-5:** Apply Holistic Understanding of Harmony on Professional Ethics.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	-	-	-	-	-	3	3	3	3	1	-	2	-	-
CO-2	-	-	-	-	-	3	3	3	3	1	-	2	-	-
CO-3	-	-	-	-	-	3	3	3	3	1	-	2	-	-
CO-4	-	-	-	-	-	3	3	3	3	1	-	2	-	-
CO-5	-	-	-	-	-	3	3	3	3	1	-	2	-	-



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**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 4th**  
**Course Outcomes**

**Course Name : Hydraulic Engineering & Machines, Course Code : KCE 403**

**After completion of this course, the student will be able to**

**CO-1:** Apply their knowledge of fluid mechanics in addressing problems in open channels.

**CO-2:** Solve problems in uniform, gradually and rapidly varied flows in steady state conditions.

**CO-3:** Apply knowledge in hydraulic machineries like pumps and turbines.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	2	2	2	-	-	-	-	1	-	-	2	-	-
CO-2	3	3	3	3	-	-	-	-	1	-	-	2	-	-
CO-3	3	3	2	2	1	-	-	-	1	-	1	2	-	-



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**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 4th**  
**Course Outcomes**  
**Course Name : Introduction to Solid Mechanics, Course Code : KCE 402**

**After completion of this course, the student will be able to**

- CO-1:** Describe the concepts and principles of stresses and strains.  
**CO-2:** Analyse solid mechanics problems using classical methods and energy methods.  
**CO-3:** Analyse structural members subjected to combined stresses.  
**CO-4:** Calculate the deflections at any point on a beam subjected to a combination of loads  
**CO-5:** Understand the behaviour of columns, springs and cylinders against loads.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	2	3	2	1	-	1	-	-	-	-	1	2	2	2
CO-2	3	3	2	2	-	-	-	-	-	-	1	2	2	2
CO-3	3	3	3	2	-	-	-	-	-	-	1	2	2	2
CO-4	2	3	2	3	-	1	-	-	-	-	1	1	2	2
CO-5	2	2	2	3	1	1	-	-	-	-	1	2	2	2



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**Program : B.Tech (Civil Engineering)**

**Academic Session : 2019 - 2020 Semester : 4th**

**Course Outcomes**

**Course Name : Materials, Testing & Construction Practices, Course Code : KCE 401**

**After completion of this course, the student will be able to**

**CO-1:** Identify various building materials and to understand their basic properties.

**CO-2:** Understand the use of non-conventional civil engineering materials.

**CO-3:** Study suitable type of flooring and roofing in the construction process.

**CO-4:** Characterize the concept of plastering, pointing and various other building services.

**CO-5:** Exemplify the various fire protection, sound and thermal insulation techniques, maintenance and repair of buildings.

**CO-PO Mapping**

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	-	-	2	-	-	-	-	1	-	-	1	-	-
CO-2	3	-	-	2	-	2	2	-	1	-	-	1	-	-
CO-3	3	-	-	2	-	2	2	2	1	-	-	2	-	-
CO-4	3	-	-	2	2	2	2	2	1	-	-	2	-	-
CO-5	3	-	-	2	3	2	2	2	1	-	-	2	-	2



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**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 4th**  
**Course Outcomes**  
**Course Name : Material Testing Lab, Course Code : KCE 451**

**After completion of this course, the student will be able to**

**CO-1:** Determine the quality of bricks, cement, fine aggregate and coarse aggregate and its suitability for construction purpose.

**CO-2:** Design the mix, make the specimens and test the same for the strength for comparison with design strength.

**CO-3:** Develop ability to function as a member of a team to complete the assigned task

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	1	-	1	1	1	1	-	1	1	1	2	-	2
CO-2	3	2	2	2	2	1	1	-	1	1	1	2	-	2
CO-3	-	-	-	-	-	-	-	-	3	1	-	1	-	2





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**Academic Session : 2019 - 2020 Semester : 4th**  
**Course Outcomes**  
**Course Name : Material Testing Lab, Course Code : KCE 451**

**After completion of this course, the student will be able to**

- CO-1:** Verify the deflection in different structural members by using apparatus  
**CO-2:** Determine the engineering properties of solid Materials.  
**CO-3:** Explain the behaviour of beams and columns under different end conditions.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	2	2	2	-	1	-	-	1	1	-	2	2	-
CO-2	3	2	2	2	2	1	-	-	1	1	-	2	2	-
CO-3	3	2	2	2	-	1	-	-	1	1	-	2	2	-



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Program : B.Tech (Civil Engineering)

Academic Session : 2019 - 2020 Semester : 5th

Course Outcomes

Course Name : Concrete Technology, Course Code : RCE 052

After completion of this course, the student will be able to

**CO-1:** Understand the properties of constituent material of concrete.

**CO-2:** Apply admixtures to enhance the properties of concrete.

**CO-3:** Design the concrete mix for desired strengths using difference methods.

**CO-4:** Evaluate the strength and durability parameters of concrete.

**CO-5:** Apply the concept of advanced concrete in construction industry.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
<b>CO-1</b>	3	-	-	2	-	-	-	-	1	-	-	1	-	3
<b>CO-2</b>	3	-	1	2	2	2	2	1	1	-	-	2	-	3
<b>CO-3</b>	3	3	3	3	2	2	2	2	1	2	-	1	3	3
<b>CO-4</b>	3	3	2	2	3	-	-	-	1	-	-	1	2	3
<b>CO-5</b>	3	1	-	-	1	2	2	1	1	-	2	2	-	3



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**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 5th**  
**Course Outcomes**  
**Course Name : CAD Lab - 1, Course Code : RCE 552**

**After completion of this course, the student will be able to**

- CO-1:** Understand latest software tools in analysis and design of civil engineering.  
**CO-2:** Apply software tools for structural analysis and design.  
**CO-3:** Apply software tools for numerical solution to geotechnical engineering problems

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	1	1	1	3	-	-	-	2	2	-	2	-	-
CO-2	3	3	3	3	3	-	-	2	2	2	-	2	3	-
CO-3	3	3	3	3	3	-	-	2	2	2	-	2	3	-



# KIET GROUP OF INSTITUTIONS, DELHI – NCR, GHAZIABAD

## DEPARTMENT OF CIVIL ENGINEERING



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**

**Academic Session : 2019 - 2020 Semester : 5th**

**Course Outcomes**

**Course Name : Concrete Technology Lab, Course Code : RCE 554**

**After completion of this course, the student will be able to**

**CO-1:** Evaluate the properties of constituent material of concrete.

**CO-2:** Assess the quality parameters of fresh & hardened concrete.

**CO-3:** Design the concrete mix for desired strength.

**CO-4:** Evaluate strength of concrete using Non-Destructive methods

**CO-PO Mapping**

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	2	2	-	-	-	-	1	1	1	-	1	-	2
CO-2	3	2	3	2	2	-	-	-	1	1	-	1	-	2
CO-3	3	2	3	2	-	-	-	-	1	1	-	1	-	2
CO-4	3	2	-	3	3	1	3	-	1	1	-	1	2	2





# KIET GROUP OF INSTITUTIONS, DELHI – NCR, GHAZIABAD

## DEPARTMENT OF CIVIL ENGINEERING



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 5th**  
**Course Outcomes**  
**Course Name : Design of Structure - 1, Course Code : RCE 502**

**After completion of this course, the student will be able to**

- CO1. Analyse the structure by suitable methods to calculate unknown forces, slope and deflection.
- CO2. Apply influence line principles for analysis of indeterminate beams and arches.
- CO3. Analyse and design cable structure using influence line diagram.
- CO4. Apply basics of force and stiffness methods of matrix analysis for beams, frames and trusses.
- CO5. Apply the concepts of plastic analysis to analyse the structure by using different mechanism.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	3	-	1	-	-	-	-	1	-	-	2	3	-
CO-2	3	3	2	1	-	-	-	-	1	-	-	2	2	-
CO-3	3	3	3	2	-	-	-	-	1	-	-	2	2	-
CO-4	3	3	2	2	-	-	-	-	1	-	-	2	3	-
CO-5	3	3	1	2	-	-	-	-	1	-	-	2	1	-



# KIET GROUP OF INSTITUTIONS, DELHI – NCR, GHAZIABAD

## DEPARTMENT OF CIVIL ENGINEERING



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 5th**

**Course Outcomes**  
**Course Name : Geotechnical Engineering Lab, Course Code : RCE 551**

**After completion of this course, the student will be able to**

- CO-1:** Determine index properties of soil sample.
- CO-2:** Classify the soils on the basis of Indian standard.
- CO-3:** Determine permeability and compaction characteristics of soil.
- CO-4:** Assess shear strength parameters of soil samples.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
<b>CO-1</b>	3	1	1	2	-	-	-	-	1	1	-	2	-	-
<b>CO-2</b>	3	1	1	2	-	-	-	-	1	1	-	2	-	-
<b>CO-3</b>	3	1	3	2	-	-	-	-	1	2	-	2	-	-
<b>CO-4</b>	3	1	3	3	-	-	-	-	1	2	-	2	-	-



# KIET GROUP OF INSTITUTIONS, DELHI – NCR, GHAZIABAD

## DEPARTMENT OF CIVIL ENGINEERING



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 5th**  
**Course Outcomes**  
**Course Name : Geotechnical Engineering, Course Code : RCE 501**

**After completion of this course, the student will be able to**

- CO-1:** Classify the soil and determine its Index properties.
- CO-2:** Evaluate permeability and seepage properties of soil.
- CO-3:** Interpret the compaction and consolidation characteristics & effective stress concept of soil.
- CO-4:** Determine the shear strength, earth pressure and slope stability of soil.
- CO-5:** Analyse bearing capacity and settlement characteristics of soil for shallow and deep foundation.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	2	1	1	-	1	1	-	2	1	-	2	-	-
CO-2	3	3	2	2	-	1	1	-	-	1	-	1	1	-
CO-3	3	3	2	2	-	1	1	-	-	1	-	1	1	1
CO-4	3	3	2	2	-	1	1	-	-	1	-	1	2	-
CO-5	3	3	3	3	-	1	1	-	-	1	-	1	3	-





# KIET GROUP OF INSTITUTIONS, DELHI – NCR, GHAZIABAD

## DEPARTMENT OF CIVIL ENGINEERING



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 5th**  
**Course Outcomes**  
**Course Name : Managerial Economics, Course Code : RAS 501**

**After completion of this course, the student will be able to**

- CO-1:** Explain meaning, definition and scope of engineering economics, demand and supply.  
**CO-2:** Explain the concept and characteristics of supply, demand forecasting and performance measures.  
**CO-3:** Describe the various forms of cost and return to scale.  
**CO-4:** Appraise market structures and propose management decisions based on features of different market structures.  
**CO-5:** Analyse features of Indian Economy and various concepts of National Income.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	2	2	1	2	1	2	3	-	1	1	1	1	-	-
CO-2	2	2	1	2	2	2	1	-	2	1	3	-	-	-
CO-3	3	2	1	2	2	2	2	1	-	1	3	2	-	-
CO-4	2	2	1	2	2	2	2	-	1	1	1	-	-	-
CO-5	2	1	1	2	2	1	2	-	-	1	3	1	-	-



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## DEPARTMENT OF CIVIL ENGINEERING



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 5th**  
**Course Outcomes**

**Course Name : Quantity Estimation and Management, Course Code : RCE 503**

**After completion of this course, the student will be able to**

CO 1: Understand the importance of units of measurement and preliminary estimate for administrative approval of projects.

CO 2: Understand the contracts and tender documents in construction projects.

CO 3: Analyse and assess the quantity of materials required for civil engineering works as per specifications.

CO 4: Evaluate and estimate the cost of expenditure and prepare a detailed rate analysis report.

CO 5: Analyse and choose cost effective approach for civil engineering projects.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	3	3	2	1	-	-	1	1	1	1	2	-	2
CO-2	-	1	-	1	-	-	-	1	1	1	1	2	-	2
CO-3	2	2	3	3	1	-	-	1	1	1	1	2	-	2
CO-4	3	3	2	3	1	-	-	-	1	1	2	1	-	2
CO-5	3	3	2	2	2	-	-	-	1	1	3	1	-	2



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## DEPARTMENT OF CIVIL ENGINEERING



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 5th**  
**Course Outcomes**  
**Course Name :Sociology, Course Code : RAS 502**

**After completion of this course, the student will be able to**

- CO-1:** Understand Nature, Scope and Importance of Industrial Sociology.
- CO-2:** Understand Industrial System and various Aspects of Industrialization.
- CO-3:** Understand Industrial Policies and Regulations of India.
- CO-4:** Explain contemporary issues in industrial sociology.
- CO-5:** Apply models of industrialization in context with social and cultural issues.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	-	-	-	-	-	3	1	-	3	-	2	1	-	-
CO-2	1	-	-	-	-	3	1	-	3	-	2	1	-	-
CO-3	-	-	-	-	-	3	1	-	3	-	-	2	-	-
CO-4	-	-	-	-	-	3	1	-	3	-	2	2	-	-
CO-5	-	-	-	-	-	3	1	-	3	2	-	3	-	-



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## DEPARTMENT OF CIVIL ENGINEERING



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

Program : B.Tech (Civil Engineering)

Academic Session : 2019 - 2020 Semester : 6th

Course Outcomes

Course Name : Transportation Engineering , Course Code : RCE 603

After completion of this course, the student will be able to

**CO-1:** Explain the development of roads, their alignment & conduct survey.

**CO-2:** Design the various geometric parameters of road.

**CO-3:** Assess the traffic characteristics & design the road intersections & signals.

**CO-4:** Examine the properties of highway materials & their application.

**CO-5:** Apply methods to construct various types of roads.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	2	2	1	-	-	1	1	-	1	1	-	-	-	-
CO-2	3	3	3	2	-	1	2	2	1	2	-	-	-	-
CO-3	3	3	3	2	-	1	2	2	1	2	-	-	-	-
CO-4	3	2	2	1	-	1	2	-	1	1	-	-	-	-
CO-5	3	2	1	-	-	2	2	-	1	-	-	-	-	2



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## DEPARTMENT OF CIVIL ENGINEERING



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 6th**  
**Course Outcomes**  
**Course Name: Transportation Engineering Lab, Course Code : RCE 653**

**After completion of this course, the student will be able to**

**CO-1:** Determine properties of aggregates and assess its suitability in construction for transportation infrastructure.

**CO-2:** Determine properties of bitumen and check its suitability for pavement construction.

**CO-3:** Investigate traffic and speed study on highway.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	2	-	-	-	1	-	-	1	2	-	-	-	-
CO-2	3	2	-	-	-	1	-	-	1	2	-	-	-	-
CO-3	3	3	-	2	3	1	-	-	1	2	-	2	-	-



# KIET GROUP OF INSTITUTIONS, DELHI – NCR, GHAZIABAD

## DEPARTMENT OF CIVIL ENGINEERING



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 6th**  
**Course Outcomes**  
**Course Name : Structure Detailing Lab, Course Code : RCE 654**

**After completion of this course, the student will be able to**

**CO-1:** Apply latest software tools for structural drafting and detailing of building components.

**CO-2:** Create bar bending schedule for structural components of a building.

**CO-3:** Understand full set of structural drawing of a building.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	1	-	-	3	-	-	1	1	2	-	2	2	-
CO-2	3	1	-	-	3	-	-	1	1	2	-	1	2	-
CO-3	3	-	-	-	-	-	-	-	2	1	-	1	-	-



# KIET GROUP OF INSTITUTIONS, DELHI – NCR, GHAZIABAD

## DEPARTMENT OF CIVIL ENGINEERING



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 6th**  
**Course Outcomes**  
**Course Name : Sociology, Course Code : RAS 602**

**After completion of this course, the student will be able to**

- CO-1:** Understand Nature, Scope and Importance of Industrial Sociology.
- CO-2:** Understand Industrial System and various Aspects of Industrialization.
- CO-3:** Understand Industrial Policies and Regulations of India.
- CO-4:** Explain contemporary issues in industrial sociology.
- CO-5:** Apply models of industrialization in context with social and cultural issues.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	-	-	-	-	-	3	1	-	3	-	2	1	-	-
CO-2	1	-	-	-	-	3	1	-	3	-	2	1	-	-
CO-3	-	-	-	-	-	3	1	-	3	-	-	2	-	-
CO-4	-	-	-	-	-	3	1	-	3	-	2	2	-	-
CO-5	-	-	-	-	-	3	1	-	3	2	-	3	-	-



# KIET GROUP OF INSTITUTIONS, DELHI – NCR, GHAZIABAD

## DEPARTMENT OF CIVIL ENGINEERING



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 6th**  
**Course Outcomes**  
**Course Name : Industrial Management, Course Code : RAS 601**

**After completion of this course, the student will be able to**

- CO-1:** Understand the Concept and scope of Industrial management and productivity.
- CO-2:** Understand theories and principles of modern management.
- CO-3:** Apply the concept of work-study and Inventory control to achieve organizational goals.
- CO-4:** Apply the quality control techniques in industrial management.
- CO-5:** Apply the concept of project management tools for industrial projects.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	1	-	-	-	-	1	-	1	1	-	1	2	-	-
CO-2	2	-	-	-	-	2	2	1	1	-	1	2	-	-
CO-3	2	2	2	3	2	-	-	-	2	2	3	1	-	-
CO-4	2	2	3	3	2	1	-	-	2	2	3	1	-	-
CO-5	2	2	3	3	2	-	-	-	3	2	3	1	-	-





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## DEPARTMENT OF CIVIL ENGINEERING



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 6th**  
**Course Outcomes**  
**Course Name : Foundation Design, Course Code : RCE 061**

**After completion of this course, the student will be able to**

- CO-1:** Apply the process of soil exploration using various methods.
- CO-2:** Analyse bearing capacity and settlement of soil for shallow foundation.
- CO-3:** Design the various types of shallow and deep foundation.
- CO-4:** Understand the characteristics of well foundations and retaining wall.
- CO-5:** Understand the concept of soil reinforcement.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	2	-	2	1	1	-	-	1	-	-	1	-	-
CO-2	3	3	2	-	3	-	-	-	1	-	-	-	2	-
CO-3	3	3	3	-	-	-	-	-	1	2	-	-	2	-
CO-4	3	2	-	-	-	-	-	-	1	-	-	-	-	-
CO-5	3	2	-	-	-	-	2	-	1	-	-	2	-	-



**KIET GROUP OF INSTITUTIONS, DELHI – NCR, GHAZIABAD**  
**DEPARTMENT OF CIVIL ENGINEERING**



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 6th**  
**Course Outcomes**  
**Course Name : Environmental Engineering, Course Code : RCE 602**

**After completion of this course, the student will be able to**

- CO-1:** Assess water demand and optimal size of water mains.
- CO-2:** Design the distribution system & assess the capacity of reservoir.
- CO-3:** Determine physical, chemical & biological parameter of water.
- CO-4:** Design treatment units for water and waste water.
- CO-5:** Apply emerging technologies for treatment of waste water.

**CO-PO Mapping**

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	3	3	3	2	3	3	1	2	1	-	1	-	-
CO-2	3	3	3	3	2	2	3	1	2	1	-	1	-	-
CO-3	3	3	1	1	1	3	3	3	2	1	-	1	-	-
CO-4	3	3	3	3	3	3	3	2	3	1	-	1	-	-
CO-5	3	3	3	3	3	3	3	3	2	1	-	3	-	-



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(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 6th**  
**Course Outcomes**  
**Course Name : Environmental Engineering Lab, Course Code : RCE 652**

**After completion of this course, the student will be able to**

**CO-1:** Measure and compare the physical, chemical and biological properties of water & waste water.

**CO-2:** Measure the level of air pollution (Particulate Matter) and noise pollution.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	2	2	1	3	3	3	2	1	1	-	2	-	-
CO-2	3	3	2	1	1	3	3	2	1	1	-	2	-	-



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(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 6th**  
**Course Outcomes**  
**Course Name : Cyber Security, Course Code : RUC 601**

**After completion of this course, the student will be able to**

- CO-1:** Understand the need of information system and security risks.
- CO-2:** Understand security risk and preventive tools in information system.
- CO-3:** Develop Secure Information Systems and assuring risk governance.
- CO-4:** Identify the need of Security Policies in emerging technologies.
- CO-5:** Understand Information Security Standards and Acts.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
<b>CO-1</b>	3	1	-	-	-	1	-	-	1	-	-	2	-	-
<b>CO-2</b>	3	2	3	3	3	1	-	-	1	-	-	2	-	-
<b>CO-3</b>	3	3	3	3	3	2	2	3	3	2	2	2	-	-
<b>CO-4</b>	1	-	-	-	2	2	-	2	1	-	-	2	-	-
<b>CO-5</b>	1	-	-	-	-	-	-	2	1	-	-	2	-	-



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**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 6th**  
**Course Outcomes**  
**Course Name : CAD Lab - 2, Course Code : RCE 651**

**After completion of this course, the student will be able to**

**CO-1:** Apply GIS software for georeferencing, digitizing and interpreting satellite images.

**CO-2:** Apply software tools for analysis and design of water distribution system.

**CO-3:** Apply software tools for numerical solution to geotechnical engineering problems.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	3	1	3	3	1	2	-	1	1	-	2	-	-
CO-2	3	3	3	3	3	2	-	-	1	1	-	2	-	-
CO-3	3	3	3	3	3	-	-	-	1	1	-	2	3	-



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**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 6th**  
**Course Outcomes**

**Course Name : Design of Structures II, Course Code : RCE 601**

**After completion of this course, the student will be able to**

- CO-1:** Design RCC beams for flexure by IS methods.
- CO-2:** Design RCC beams for shear by IS methods.
- CO-3:** Design RCC slabs and staircase by IS methods.
- CO-4:** Design the RCC compression members by IS methods.
- CO-5:** Design various types of footings and cantilever retaining wall.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
<b>CO-1</b>	3	3	3	2	2	1	-	2	1	1	-	2	2	-
<b>CO-2</b>	3	3	3	2	2	1	-	2	1	1	-	2	2	-
<b>CO-3</b>	3	3	3	2	2	1	-	2	1	1	-	2	2	-
<b>CO-4</b>	3	3	3	2	2	1	-	2	1	1	-	3	2	-
<b>CO-5</b>	3	3	3	2	2	1	-	2	1	1	-	2	2	-



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## DEPARTMENT OF CIVIL ENGINEERING



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

Program : B.Tech (Civil Engineering)

Academic Session : 2019 - 2020 Semester : 7th

Course Outcomes

Course Name : Geology and Soil Mechanics, Course Code : RCE 071

After completion of this course, the student will be able to

**CO-1:** Understand different rock forming minerals and their suitability as engineering material.

**CO-2:** Analyse folds and faults in rock masses & their behaviour.

**CO-3:** Summarize the concepts of earthquakes & landslides and preventive measures in earthquake/landslide prone areas.

**CO-4:** Examine the sites for tunnels, dams, bridges and highways.

**CO-5:** Understand basic concepts of soil mechanics.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
<b>CO-1</b>	3	3	1	3	-	-	1	-	1	1	-	2	1	2
<b>CO-2</b>	3	3	2	3	-	1	2	-	1	1	-	2	1	-
<b>CO-3</b>	3	3	3	3	-	1	2	-	1	1	-	2	2	2
<b>CO-4</b>	3	3	3	3	1	2	2	1	2	2	2	2	3	3
<b>CO-5</b>	3	3	1	1	-	1	1	-	1	1	-	2	-	-



# KIET GROUP OF INSTITUTIONS, DELHI – NCR, GHAZIABAD

## DEPARTMENT OF CIVIL ENGINEERING



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 7th**  
**Course Outcomes**  
**Course Name : Industrial Training, Course Code : RCE 753**

**After completion of this course, the student will be able to**

**CO-1:** Develop new skills and awareness about state of art practices in various Engineering disciplines.

**CO-2:** Operate and communicate efficiently as a part of multi-tasking professionals' team.

**CO-3:** Apply reasoning and logical aptitude while working in society, dealing with real life problems.

**CO-4:** Compose and present technical reports effectively.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	1	-	1	2	1	1	1	1	1	2	2	2	2
CO-2	2	1	-	-	-	1	-	2	1	2	2	1	-	-
CO-3	1	1	-	-	-	2	-	1	1	1	1	2	-	-
CO-4	-	1	-	-	-	-	-	1	1	3	2	2	-	-





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## DEPARTMENT OF CIVIL ENGINEERING



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 7th**  
**Course Outcomes**  
**Course Name : Mini Project, Course Code : RCE 752**

**After completion of this course, the student will be able to**

- CO-1:** Compose detailed project report for a project in civil engineering domain.  
**CO-2:** Design a system, component or process to meet desired progress of project.  
**CO-3:** Formulate solution to the different civil engineering projects.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	3	3	3	2	2	2	2	3	3	3	2	3	1
CO-2	3	3	3	3	2	2	2	2	3	2	3	2	3	3
CO-3	3	3	3	3	2	2	2	2	3	2	3	2	3	3



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## DEPARTMENT OF CIVIL ENGINEERING



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**

**Academic Session : 2019 - 2020 Semester : 7th**

**Course Outcomes**

**Course Name : Non-Destructive Testing Lab, Course Code : RCE 751**

**After completion of this course, the student will be able to**

**CO-1:** Determine strength of the concrete using non-destructive testing methods.

**CO-2:** Determine strength of the steel using non-destructive testing methods.

**CO-3:** Apply specific codes, standards and specifications related to non-destructive methods for testing of concrete and structural steel.

**CO-PO Mapping**

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	3	3	3	3	1	1	-	2	1	-	2	-	1
CO-2	3	3	3	3	3	1	1	-	2	1	-	2	-	1
CO-3	3	3	3	3	-	-	-	2	-	-	-	2	-	-



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## DEPARTMENT OF CIVIL ENGINEERING



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 7th**  
**Course Outcomes**  
**Course Name : Project-1, Course Code : RCE 754**

**After completion of this course, the student will be able to**

- CO-1:** Operate effectively as an individual and member of the team to solve complex civil engineering problems
- CO-2:** Apply engineering knowledge to solve real life problems and involve in self-learning process
- CO-3:** Apply modern tools for analysis and design of complex engineering problems
- CO-4:** Develop ethical solutions of engineering problems taking into account its impact on society, environment and sustainability
- CO-5:** Compose and present detailed project report of his/ her work and defend effectively.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	3	3	3	2	2	2	3	3	2	2	2	1	-
CO-2	3	3	3	2	2	2	2	2	2	2	1	2	3	-
CO-3	3	3	3	3	3	2	2	2	2	2	1	3	3	-
CO-4	3	3	3	2	2	2	3	3	2	2	1	2	2	-
CO-5	2	2	2	1	1	1	1	3	2	3	3	1	1	-



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## DEPARTMENT OF CIVIL ENGINEERING



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

Program : B.Tech (Civil Engineering)

Academic Session : 2019 - 2020 Semester : 7th

Course Outcomes

Course Name : Railways, Airports and Waterways, Course Code : RCE 076

After completion of this course, the student will be able to

**CO1** : Explain the importance of railway infrastructure.

**CO2** : Identify the factors governing design of railway infrastructures.

**CO3** : Analyse and design the railway track system.

**CO4** : Understand the concepts of airport engineering and design components of airport.

**CO5** : Associate with the concepts of water transport system.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
<b>CO-1</b>	1	1	1	-	-	-	-	-	1	1	-	1	-	-
<b>CO-2</b>	3	3	3	2	2	1	1	-	1	2	1	1	2	1
<b>CO-3</b>	2	1	1	-	2	-	-	-	1	1	1	1	-	-
<b>CO-4</b>	3	3	3	2	2	1	1	-	1	2	1	1	2	1
<b>CO-5</b>	1	1	1	-	-	-	-	-	1	1	-	1	-	-



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## DEPARTMENT OF CIVIL ENGINEERING



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

Program : B.Tech (Civil Engineering)

Academic Session : 2019 - 2020 Semester : 7th

Course Outcomes

Course Name : Rural Development Engineering, Course Code : RCE 072

After completion of this course, the student will be able to

**CO-1:** Apply the basic concepts of rural development planning using appropriate technology.

**CO-2:** Apply the various techniques of rural housing construction using low cost construction material.

**CO-3:** Apply the knowledge of water supply & sanitation in rural development.

**CO-4:** Understand the concepts of low cost roads in rural areas.

**CO-5:** Assess the feasibility of low cost irrigation & watershed management techniques.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	1	3	1	2	3	3	1	1	2	-	2	-	1
CO-2	3	1	1	-	1	3	3	1	1	2	-	-	1	2
CO-3	3	2	2	1	-	1	1	1	2	1	-	-	-	-
CO-4	2	1	1	-	-	1	2	-	1	-	-	1	-	-
CO-5	2	3	3	-	-	1	1	-	1	-	-	1	-	-



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## DEPARTMENT OF CIVIL ENGINEERING



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**

**Academic Session : 2019 - 2020 Semester : 7th**

**Course Outcomes**

**Course Name : Design of Structure - III, Course Code : RCE 701**

**After completion of this course, the student will be able to**

**CO-1:** Understand properties of steel and types of loads acting on steel structures.

**CO-2:** Design welded and bolted type of connections for elementary steel structures.

**CO-3:** Design tension members for elementary steel structures.

**CO-4:** Design compression members such as simple columns, braced and latticed columns and column bases.

**CO-5:** Design flexural members such as beams, purlins and girders.

**CO-PO Mapping**

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	2	1	1	-	1	1	-	-	-	-	1	2	-
CO-2	3	3	3	2	-	1	1	3	1	-	-	1	3	-
CO-3	3	3	3	2	-	1	1	3	1	-	-	1	3	-
CO-4	3	3	3	2	-	1	1	3	1	-	-	1	3	-
CO-5	3	3	3	2	-	1	1	3	1	-	-	1	3	-



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## DEPARTMENT OF CIVIL ENGINEERING



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**

**Academic Session : 2019 - 2020 Semester : 7th**

**Course Outcomes**

**Course Name : Structural Health Monitoring And Rehabilitation, Course Code : RCE 073**

**After completion of this course, the student will be able to**

**CO-1:** Understand the fundamentals of maintenance and repair strategies.

**CO-2:** Identify for serviceability and durability aspects of concrete.

**CO-3:** Identify the materials and techniques used for repair of structures.

**CO-4:** Decide the appropriate repair and retrofitting techniques.

**CO-5:** Use appropriate health monitoring technique and demolition methods.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	2	2	2	2	2	-	-	1	1	-	2	-	-
CO-2	3	3	-	2	2	2	-	-	1	1	-	2	-	-
CO-3	3	1	-	2	2	2	-	-	1	1	-	2	-	-
CO-4	3	3	3	2	2	2	-	-	1	1	-	2	-	-
CO-5	3	3	2	2	2	2	-	-	1	1	-	2	-	-



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## DEPARTMENT OF CIVIL ENGINEERING



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**

**Academic Session : 2019 - 2020 Semester : 7th**

**Course Outcomes**

**Course Name : Understanding the Human Being Comprehensively-Human Aspirations and its Fulfilment, Course Code : ROE 074**

**After completion of this course, the student will be able to**

**CO-1:** Understand the universal nature of human being and relatedness to others.

**CO-2:** Understand the human aspirations, goal, activities and purpose of life.

**CO-3:** Understand the harmony in self and nature.

**CO-4:** Understand human tradition and its various attributes.

**CO-5:** Develop sustainable solution to the problems of society and nature.

**CO-PO Mapping**

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	-	-	-	-	-	3	3	3	3	1	-	-	-	-
CO-2	-	-	-	-	-	3	3	3	3	1	-	-	-	-
CO-3	-	-	-	-	-	3	3	3	3	1	-	-	-	-
CO-4	-	-	-	-	-	3	3	3	3	1	-	-	-	-
CO-5	-	-	2	-	-	3	3	3	3	1	1	1	-	-





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## DEPARTMENT OF CIVIL ENGINEERING



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 7th**  
**Course Outcomes**  
**Course Name : Water Resources, Course Code : RCE 702**

**After completion of this course, the student will be able to**

- CO-1:** Explain the application of water in different irrigation methods.  
**CO-2:** Design the canals and drainage sections.  
**CO-3:** Design the regulatory and river training works.  
**CO-4:** Design the weir, barrages and cross drainage works.  
**CO-5:** Design the dams, spillways and explain the generation of hydroelectric power.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	2	2	1	1	-	1	1	-	1	-	-	1	-	-
CO-2	3	2	2	2	-	2	1	-	1	-	-	-	1	-
CO-3	2	2	2	2	-	1	2	-	1	-	-	-	1	-
CO-4	3	3	2	2	-	2	1	-	1	-	-	-	1	-
CO-5	3	2	2	-	-	2	2	-	1	-	-	1	-	-



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## DEPARTMENT OF CIVIL ENGINEERING



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

Program : B.Tech (Civil Engineering)

Academic Session : 2019 - 2020 Semester : 8th

Course Outcomes

Course Name : Engineering Hydrology & Ground Water Management, Course Code : RCE 085

After completion of this course, the student will be able to

**CO-1:** Understand the basic concept of hydrological cycle and its various phases.

**CO-2:** Understand the concept of run off and apply the knowledge to construct the hydrograph.

**CO-3:** Apply the various methods to assess the flood.

**CO-4:** Assess the quality of various forms of water and their aquifer properties.

**CO-5:** Understand the well hydraulics and apply ground water modelling techniques.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	1	-	-	-	-	-	-	-	-	-	-	-	-
CO-2	3	3	3	2	-	-	-	-	-	1	-	2	-	-
CO-3	3	3	3	3	-	3	-	-	-	2	-	2	-	-
CO-4	3	2	2	2	-	2	-	-	-	2	-	-	-	-
CO-5	3	3	3	3	3	2	3	2	1	3	-	2	-	2



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## DEPARTMENT OF CIVIL ENGINEERING



(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 8th**  
**Course Outcomes**

**Course Name : Earthquake Resistant Design of Structure, Course Code : RCE 088**

**After completion of this course, the student will be able to**

**CO-1:** Explain basic concept of seismology.

**CO-2:** Understand the technique of modelling of structures & dynamics of single degree of freedom system.

**CO-3:** Explain the dynamics of multi degree freedom system, idealization of structures and its seismic response.

**CO-4:** Design the earthquake resistant structures.

**CO-5:** Design the machine foundation.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	2	2	1	1	-	-	-	-	-	-	-	-	-	-
CO-2	3	3	3	2	-	-	-	-	-	-	-	2	-	-
CO-3	3	3	3	3	-	-	-	-	-	-	-	2	-	-
CO-4	3	3	3	3	-	-	2	1	2	2	-	2	3	-
CO-5	3	3	3	3	-	-	2	2	2	2	-	2	3	-



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(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 8th**  
**Course Outcomes**  
**Course Name : Project-2, Course Code : RCE 852**

**After completion of this course, the student will be able to**

- CO-1:** Operate effectively as an individual and member of the team to solve complex civil engineering problems
- CO-2:** Apply engineering knowledge to solve real life problems and involve in self-learning process
- CO-3:** Apply modern tools for analysis and design of complex engineering problems
- CO-4:** Develop ethical solutions of engineering problems taking into account its impact on society, environment and sustainability
- CO-5:** Compose and present detailed project report of his/ her work and defend effectively.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
<b>CO-1</b>	3	3	3	3	2	2	2	3	3	2	2	2	1	-
<b>CO-2</b>	3	3	3	2	2	2	2	2	2	2	1	2	3	-
<b>CO-3</b>	3	3	3	3	3	2	2	2	2	2	1	3	3	-
<b>CO-4</b>	3	3	3	2	2	2	3	3	2	2	1	2	2	-
<b>CO-5</b>	2	2	2	1	1	1	1	3	2	3	3	1	1	-



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**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 8th**  
**Course Outcomes**  
**Course Name : Renewable Energy Resources, Course Code : ROE 086**

**After completion of this course, the student will be able to**

- CO-1:** Identify various non-conventional energy resources and their applications.  
**CO-2:** Interpret various methods of solar energy applications.  
**CO-3:** Apply concept of geothermal energy conversion processes, magneto-hydrodynamics and fuel cells.  
**CO-4:** Apply concept of wind energy conversion and thermionic conversions.  
**CO-5:** Explain the conversion methodologies of biomass and ocean energy.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	3	1	-	-	-	-	-	-	-	-	-	2	-	-
CO-2	3	1	2	-	2	2	2	-	-	-	-	2	-	-
CO-3	3	1	2	2	2	2	2	-	2	1	1	2	-	-
CO-4	3	1	2	2	2	2	2	-	2	1	1	2	-	-
CO-5	3	1	2	2	2	2	2	-	-	-	-	2	-	-



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(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 8th**  
**Course Outcomes**  
**Course Name : Seminar, Course Code : RCE 851**

**After completion of this course, the student will be able to**

**CO-1:** Identify, understand and discuss current, real-world issues.

**CO-2:** Acquire, understand and convey intended meaning of chosen topic using verbal and non-verbal method of communication.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	2	2	-	-	2	1	2	1	2	2	-	2	-	-
CO-2	2	2	-	-	2	1	2	1	3	3	-	2	-	-



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**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 8th**  
**Course Outcomes**  
**Course Name : Solid Waste Management, Course Code : RCE 084**

**After completion of this course, the student will be able to**

- CO-1:** Understand the concept of solid waste management.
- CO-2:** Explain handling and processing of solid waste.
- CO-3:** Apply the concept of landfilling for disposal of solid waste.
- CO-4:** Design composting and other solid waste conversion units.
- CO-5:** Understand the various hazardous waste, risk assessment and legislation.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	2	-	-	-	-	3	3	2	-	-	-	-	-	-
CO-2	3	-	-	-	-	3	3	2	-	-	-	2	-	-
CO-3	3	2	2	1	-	3	3	2	1	2	-	1	-	-
CO-4	3	2	2	1	-	3	3	2	1	2	-	2	-	-
CO-5	2	-	-	-	-	3	3	2	-	-	-	2	-	-



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(An ISO – 9001:2008 Certified & 'A' Grade accredited Institution by NAAC)

**Program : B.Tech (Civil Engineering)**  
**Academic Session : 2019 - 2020 Semester : 8th**  
**Course Outcomes**

**Course Name : Value Relationship & Ethical Human Conduct, Course Code : ROE 088**

**After completion of this course, the student will be able to**

**CO-1:** Understand the importance of relationship among humans and rest of nature.

**CO-2:** Understand the expressions for different established values.

**CO-3:** Apply the concept of justice in different relationships and contacts.

**CO-4:** Identify the role of education, health, production & justice in the society to maintain universal human order & undivided society.

**CO-5:** Understand the various human traditions and the linkages between those traditions.

### CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1 (PO-13)	PSO-2 (PO-14)
CO-1	-	-	-	-	-	2	2	3	1	-	-	2	-	-
CO-2	-	-	-	-	-	2	2	3	1	-	-	2	-	-
CO-3	-	-	-	-	-	2	2	3	1	-	-	2	-	-
CO-4	-	-	-	-	-	2	2	3	1	-	-	2	-	-
CO-5	-	-	-	-	-	2	2	3	1	-	-	2	-	-