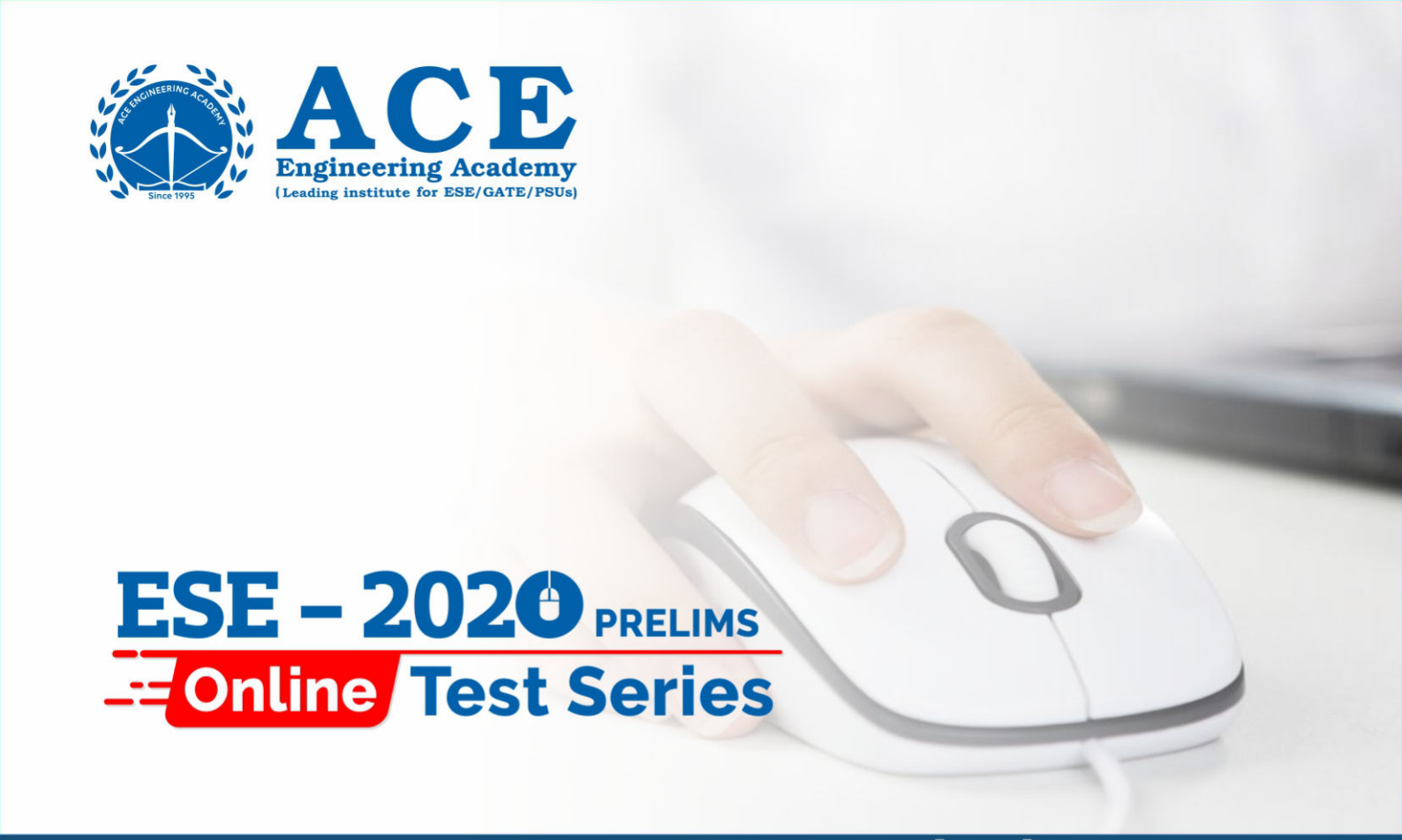
ACE Engineering Academy
(Leading institute for ESE/GATE/PSUs)



ESE – 2020 PRELIMS
Online Test Series

CIVIL ENGINEERING (CE)

No. of Tests : 44 + Free **30 Practice Tests of ESE - 2019 Online Test Series**

	ESE- 2020 Test Series	Practice Tests ESE - 2019 Test Series
Subject Wise Grand Tests	22	22
Multi Subject Grand Tests	10	-
Full Length Mock Tests	12	8

All tests will be available till ESE -2020 (Prelims) Examination.

TEST SERIES HIGHLIGHTS

- ★ All India Rank will be given for each test.
- ★ Test wise and overall statistics.
- ★ Comparison with toppers.
- ★ Question wise and test wise time analysis & comparison with toppers on time management.

Subject-wise Tests

Tests will be activated at 06:00 pm on scheduled day

Test No	Subject Name	No. of Questions	Max Marks	Duration	Date of Activation
CE-01	Transportation Engineering	50	100	60 Min	15-05-2019
CE-02	Solid Mechanics	50	100	60 Min	
CE-03	Flow of Fluids, Hydraulic Machines and Hydro Power	50	100	60 Min	21-05-2019
CE-04	Engineering Mathematics and Numerical Analysis	33	66	40 Min	
CE-05	Environmental Engineering	50	100	60 Min	28-05-2019
CE-06	Basics of Energy and Environment	33	66	40 Min	
CE-07	Structural Analysis	50	100	60 Min	04-06-2019
CE-08	General Principles of Design, Drawing, Importance of Safety	33	66	40 Min	
CE-09	Geo-technical Engineering and Foundation Engineering	50	100	60 Min	11-06-2019
CE-10	Ethics and values in Engineering profession	33	66	40 Min	
CE-11	Design of Concrete and Masonry structures	50	100	60 Min	18-06-2019
CE-12	Information and Communication Technologies (ICT)	33	66	40 Min	
CE-13	Surveying and Geology	50	100	60 Min	25-06-2019
CE-14	Engineering Aptitude covering Logical reasoning and Analytical ability	33	66	40 Min	
CE-15	Design of Steel Structures	50	100	60 Min	02-07-2019
CE-16	Basics of Material Science and Engineering	33	66	40 Min	
CE-17	Hydrology and Water Resources Engineering	50	100	60 Min	09-07-2019
CE-18	Standards and Quality practices in production, construction, maintenance and services	33	66	40 Min	
CE-19	Building Materials	50	100	60 Min	16-07-2019
CE-20	Basics of Project Management	33	66	40 Min	
CE-21	Construction Practice, Planning and Management	50	100	60 Min	23-07-2019
CE-22	Current Issues of National and International importance related to social, Economic and Industrial Development	33	66	40 Min	

Full Length Mock Tests -1st Series

Test No	Mock codes	No. of Questions	Max Marks	Duration	Date of Activation
CE-23	Mock-1 PAPER-1	100	200	2 Hours	05-08-2019
CE-24	Mock-1 PAPER-2	150	300	3 Hours	
CE-25	Mock-2 PAPER-1	100	200	2 Hours	12-08-2019
CE-26	Mock-2 PAPER-2	150	300	3 Hours	

Multi Subject Grand Tests

Test No	Subjects codes	No. of Questions	Max Marks	Duration	Date of Activation
CE-27	Flow of Fluids, Hydraulic Machines and Hydro Power + Surveying and Geology	50	100	60 Min	20-08-2019
CE-28	Basics of Energy and Environment + Engineering Aptitude covering Logical reasoning and Analytical ability	33	66	40 Min	
CE-29	Solid Mechanics + Construction Practice, Planning and Management + Water Resources Engineering	50	100	60 Min	27-08-2019
CE-30	Engineering Mathematics and Numerical Analysis + Current Issues of National and International importance related to social, Economic and Industrial Development	33	66	40 Min	
CE-31	Design of Steel Structures + Transportation Engineering + Geo-technical Engineering and Foundation Engineering	50	100	60 Min	03-09-2019
CE-32	Basics of Project Management + Basics of Material Science and Engineering	33	66	40 Min	
CE-33	Environmental Engineering + Structural Analysis	50	100	60 Min	10-09-2019
CE-34	Information and Communication Technologies (ICT) + General Principles of Design, Drawing, Importance of Safety	33	66	40 Min	
CE-35	Building Materials + Design of Concrete and Masonry structures + Hydrology	50	100	60 Min	17-09-2019
CE-36	Ethics and values in Engineering profession + Standards and Quality practices in production, construction, maintenance and services	33	66	40 Min	

Full Length Mock Tests -2nd Series

Test No	Mock codes	No. of Questions	Max Marks	Duration	Date of Activation
CE-37	Mock-3 PAPER-1	100	200	2 Hours	30-09-2019
CE-38	Mock-3 PAPER-2	150	300	3 Hours	
CE-39	Mock-4 PAPER-1	100	200	2 Hours	14-10-2019
CE-40	Mock-4 PAPER-2	150	300	3 Hours	
CE-41	Mock-5 PAPER-1	100	200	2 Hours	18-12-2019
CE-42	Mock-5 PAPER-2	150	300	3 Hours	
CE-43	Mock-6 PAPER-1	100	200	2 Hours	25-12-2019
CE-44	Mock-6 PAPER-2	150	300	3 Hours	

NOTE: The Dates of above MOCK Tests may Change according to the ESE – 2020(Prelims) Exam schedule.

Free Practice Tests of ESE (Prelims)-2019 Online Test Series

Subject-wise Tests

Test No	Subject Name	No. of Questions	Max Marks	Duration	Date of Activation
CE-P1	Solid Mechanics	50	100	60 Min	15-05-2019
CE-P2	Flow of Fluids, Hydraulic Machines and Hydro Power	50	100	60 Min	
CE-P3	Geo-technical Engineering and Foundation Engineering	50	100	60 Min	
CE-P4	Structural Analysis	50	100	60 Min	
CE-P5	Design of Concrete and Masonry structures	50	100	60 Min	
CE-P6	Environmental Engineering	50	100	60 Min	
CE-P7	Surveying and Geology	50	100	60 Min	
CE-P8	Design of Steel Structures	50	100	60 Min	
CE-P9	Hydrology and Water Resources Engineering	50	100	60 Min	
CE-P10	Transportation Engineering	50	100	60 Min	
CE-P11	Building Materials	50	100	60 Min	
CE-P12	Construction Practice, Planning and Management	50	100	60 Min	
CE-P13	Basics of Energy and Environment	33	66	40 Min	30-05-2019
CE-P14	Standards and Quality practices in production, construction, maintenance and services	33	66	40 Min	
CE-P15	Basics of Project Management	33	66	40 Min	
CE-P16	Information and Communication Technologies (ICT)	33	66	40 Min	
CE-P17	Ethics and values in Engineering profession	33	66	40 Min	
CE-P18	Engineering Aptitude covering Logical reasoning and Analytical ability	33	66	40 Min	
CE-P19	Basics of Material Science and Engineering	33	66	40 Min	
CE-P20	General Principles of Design, Drawing, Importance of Safety	33	66	40 Min	
CE-P21	Engineering Mathematics and Numerical Analysis	33	66	40 Min	
CE-P22	Current Issues of National and International importance related to social, Economic and Industrial Development	33	66	40 Min	

Full Length Mock Tests

Test No	Mock codes	No. of Questions	Max Marks	Duration	Date of Activation
CE-P23	Mock-1 PAPER-1	100	200	2 Hours	20-06-2019
CE-P24	Mock-1 PAPER-2	150	300	3 Hours	
CE-P25	Mock-2 PAPER-1	100	200	2 Hours	
CE-P26	Mock-2 PAPER-2	150	300	3 Hours	
CE-P27	Mock-3 PAPER-1	100	200	2 Hours	
CE-P28	Mock-3 PAPER-2	150	300	3 Hours	
CE-P29	Mock-4 PAPER-1	100	200	2 Hours	
CE-P30	Mock-4 PAPER-2	150	300	3 Hours	

Syllabus for ESE (Prelims), Paper-1

Subject Name	Syllabus
Basics of Energy and Environment : Conservation, environmental pollution and degradation, Climate Change, Environmental impact assessment	**Energy –Basics of Environment– Conservation** **Energy:** Concept of Energy, Classification of Energy Resources , Energy Resources in India Energy Policies and Acts in India. **Basics of Environment:** Components of Ecosystem, Ecosystem, Types of Ecosystem, Structure of Ecosystem, Terminology of Species, Nutrient Cycles. **Conservation:** ***Biodiversity*** **-** Types of Biodiversity, Value of Biodiversity, Loss of Biodiversity, Threat to Biodiversity, Conservation of Biodiversity, International & National Policies of Biodiversity, International & National Organizations related to Biodiversity, Acts related to biodiversity. ***Sustainable Development***- Concept of Sustainable Development, Carrying Capacity, Ecological Foot Print, Earth Debt day, Principles of Sustainable Development, Initiatives of Sustainable Development , Millennium Development Goals,Sustainable Development Goal, Sustainable Agriculture. **Climate Change – Degradation– Pollution** ***Climate Change:*** Introduction- Basic of Climate Change-Green House Effect, Causes , Impacts. Ozone Depletion-Causes, Impacts , International & National Measures to Control Ozone Depletion. Acid Rains-Causes, Effects, International & National Measures to Control Climate Change. ***Degradation:*** Deforestation-Causes, Impact, Preventive measures, Soil erosion-Causes, Impact, Preventive measures, Desertification-Causes, Impact, Preventive measures. ***Pollution:*** Basic Concepts- Types of Pollution, Air Pollution, Sources, Impacts, Controls, Water Pollution, Sources, Impacts, Controls, Noise Pollution, Sources, Impacts, Controls , Soil Pollution, Sources, Impacts, Controls, Radiation Pollution, Sources, Impacts, Controls, Solid Waste, Sources, Impacts, Controls. **Environmental Impact Assessment(EIA):** Concept; Principles; Process; stakeholders; Projects requiring EIA; Social Impact Assessment; Merits and Demerits of EIA;
Engineering Aptitude covering Logical reasoning and Analytical ability	Engineering Aptitude . Logical reasoning & Analytical ability.
Engineering Mathematics and Numerical Analysis	Matrix theory, Eigen values & Eigen vectors, system of linear equations, Numerical methods for solution of non-linear algebraic equations and differential equations, integral calculus, partial derivatives, maxima and minima, Line, Surface and Volume Integrals . Fourier series, linear, nonlinear and partial differential equations, initial and boundary value problems, complex variables, Taylor's and Laurent's series, residue theorem, probability and statistics fundamentals, Sampling theorem, random variables, Normal and Poisson distributions, correlation and regression analysis.

Subject Name	Syllabus
Current Issues of National and International importance related to social, Economic and Industrial Development	**Background Concepts** ***Economic and Industrial Development*** Development - Growth; three Sectors of Economy - Agriculture, Industry and Services; National Income; Inflation; Banking; Financial Markets; Public Finance; External Sector ; Economic Infrastructure; and Related Policies and Schemes of Govt. ***Social Development :*** Planning-NITI Ayog; Poverty-Unemployment; Rural and Urban Development; Education; Welfare; Women and Childern; International Issues: Indias bilateral and Multilateral issues; UNO- Agencies, Funds; Economic Institutions-World Bank, IMF,WTO,ADB,AIIB; Agreements and Summits. **Current Affairs:**
Basics of Project Management	**Intoduction:** Project and project management, classification of project, project life cycle, tools & techniques in Project management. **Project Planning:** Selection of a project, objective and goals, work break down structure (WBS). **Project Scheduling:** Scheduling tools, charts, network diagrams, CPM Networks, PERT Networks **Resource Allocation:** project crashing, resource leveling & smoothening. **Project Monitoring & Controlling:** Monitoring tools, project controlling. **Project Auditing & Termination:** Purpose of auditing-goals of the system, project termination (Closeout), project procurement and materials management.
Basics of Material Science and Engineering	**Crystal structures and Defects:-**Primary bonds, Space lattice, unit cell, lattice parameters, crystal structures, coordination number and packing factor of SC, BCC, FCC, Diamond structures, point defects, line defects, crystallographic planes and directions. Crystalline materials and amorphous materials. **Electrical Materials:-** Conductors – Ohm's Law, specific resistance, high conductivity materials, Low conductivity materials, contact materials, alloy conductors and applications, semiconductors, Energy band gap theory, Insulators and super conductors. **Nano materials:-** definition, preparation and properties, Graphite, CNT, Fulerene, Graphene, Quantum dots and their properties and applications, MEMS, NEMS. **Iron-Carbon Diagram and Steel alloys:-** Basics of phase diagram, Types of steels and steel alloys, properties of steel **Polymers:-** Structure and Types of polymers, characteristics and applications of polymers. **Nuclear materials:-** Basics of Nuclear Physics (Fission, Fussion), applications. **Dielectric Materials:-** Polarization, dielectric strength, break down, polar, non polar solids, Ferroelectrics, Piezo electrics, pyro electrics and their materials and applications. **Magnetic Materials:-** Magnetization, susceptibility and classification of magnetic materials – dia, para, ferro, anti ferro and ferri magnetic materials, hard and soft magnetic materials, influence of temperature on magnetic materials. **Ceramic materials:-** Types and application of different ceramics and their advanced types. **Composite materials:-** Types and their applications. **Material Properties and Testing:-** Elasticity, plasticity, ductility, Stiffness, malleability, fatigue, Toughness, creep, hardness etc.Material Testing methods, Non destructive testing methods.
General Principles of Design, Drawing, Importance of Safety	Design Process, Team Behavior, Problem Definition-Customer Requirements, Concept Generation, Decision Making & Concepts Evaluation, Embodiment Design, Detail Design, Introduction to Scales and Curves, Orthographic Projections, Isometric & Perspective Projections, Conventional Representation, AUTO CAD and Importance of Safety

Subject Name	Syllabus
Ethics and values in Engineering profession	Introduction to Ethics and Values in Engineering Profession, Moral Reasoning and Ethical Theories, Codes of Ethics, Engineering-Social Experimentation, Engineer's Responsibility for Safety and Risk, Responsibilities and Rights of Engineers, Global Issues, Ethical Audit & Ethical Governance and Public Servants
Information and Communication Technologies (ICT) based tools and their applications in Engineering such as networking, e-governance and technology based education.	**Information and Communication Technologies** **ICT & Networks:** Introduction to ICT and Networks, Network Typologies: PAN, LAN, MAN,WAN, Internet; Modems, ASDL, Ethernet; Inter-networking: Repeaters, switches, routers, gateways, IPv4, IPv6;DNS, e-mail, WWW; **Modern wireless technologies:** RFID, Near Field Communication, Bluetooth, Wi-Fi, WIMAX, Li-Fi, White-Fi etc. **Cellular Network Technologies:** 1G,2G,3G,4G, 5G, GSM, CDMA, EDGE, GPRS, UMTS, LTE. Satellite technologies :types of satellite , orbits **Cyber Security:** Types, Threats: E-Mail Tracking , Social Engineering, Identity Theft, Phishing, Trojans, Backdoors, Viruses, Worms, DoS and DDoS Attacks, BOTs/BOTNETs; Defenses: Digital Signatures, Firewall, Virtual Private Networks (VPN) etc.; **Computing:** Parallel, Distributed, Grid, Cloud, Super computers etc **Computer Data Storage Devices:** Types and Technologies like magnetic storage devices, optical storage devices CD, DVD, Blu-ray Disc, USB Flash Drive etc,holostore **Advanced Topics and Recent trends:** Social networks, Big data, Project Loon, White Spaces, Internet of Things; Social Networking and its platforms like Facebook, Twitter, Google Talk, Skype and e-commerce; Internet Governance: Digital Divide, Net Neutrality, Internet.org;virtual reality , augmented reality ,software engineering , **Government Policies and Schemes on ICT.** **e -Governance and Technology based Education** **e-Governance:** Meaning, Models, Scope, Advantages, Challenges; Good Governance and e-Governance; **e-governance in India:** NeGP, e-Governance Infrastructure, GoI Cloud Initiative – Meghraj; Digital India: Broadband Highways, e-Kranti, Digital Locker, BAS, eSign, National Digital Literacy Mission, Bharat Net (National Optical Fibre Network (NOFN)), e-Hospital, e-Education etc. eNAM, e-District, e-Haat; **Technology based Education:** Concept, mechanisms, merits and demerits; Applications; International practices like MOOC, Open Course Ware Consortium, Open Learn Project; ICT tools: MatLab, Mathematica, AutoCAD, SkyDrive, MS Office 365, Google Docs, etc. **e-education in India:** National Mission on Education through Information and Communication Technology (NMEICT), National Programme on Technology Enhanced Learning (NPTEL), e-Shodh Sindhu, Virtual Labs, EDUSAT, eBasta, Digital Library of India (DLI), National Digital Library(NDL), ENVIS, Indian Sign Language Education and Recognition System etc.
Standards and Quality practices in production, construction, maintenance and services	Introduction, Quality costs, Quality philosophy, Service Quality, Tools of Quality Control, Continuous Improvement Techniques, Maintenance, ISO and TQM & Construction Quality

Syllabus for ESE (Prelims), Paper-2

Subject Name	Syllabus
Building Materials	Stone, Lime, Glass, Plastics, Steel, FRP, Ceramics, Aluminum, Fly Ash,Basic Admixtures, Timber, Bricks and Aggregates: Classification,properties and selection criteria;Cement: Types, Composition, Properties, Uses, Specifications andvarious Tests; Lime & Cement Mortars and Concrete: Properties andvarious Tests; Design of Concrete Mixes: Proportioning of aggregatesand methods of mix design.
Solid Mechanics	Elastic constants, Stress, plane stress, Strains, plane strain, Mohr'scircle of stress and strain, Elastic theories of failure, Principal Stresses, Bending, Shear and Torsion.
Structural Analysis	Basics of strength of materials, Types of stresses and strains, Bending moments and shear force, concept of bending and shear stresses; Analysis of determinate and indeterminate structures; Trusses, beams, plane frames; Rolling loads, Influence Lines, Unit load method & other methods; Free and Forced vibrations of single degree and multi degree freedom system; Suspended Cables; Concepts and use of Computer Aided Design.
Design of Steel Structures	Principles of Working Stress methods, Design of tension and compression members, Design of beams and beam column connections, built-up sections, Girders, Industrial roofs, Principles of Ultimate load design.
Design of Concrete and Masonry structures	Limit state design for bending, shear, axial compression and combined forces; Design of beams, Slabs, Lintels, Foundations, Retaining walls, Tanks, Staircases; Principles of pre-stressed concrete design including materials and methods; Earthquake resistant design of structures; Design of Masonry Structure.
Construction Practice, Planning and Management	Construction - Planning, Equipment, Site investigation and Management including Estimation with latest project management tools and network analysis for different Types of works; Analysis of Rates of various types of works; Tendering Process and Contract Management, Quality Control, Productivity, Operation Cost; Land acquisition; Labour safety and welfare.
Flow of Fluids, Hydraulic Machines and Hydro Power	**(a)** Fluid Mechanics, Open Channel Flow, Pipe Flow: Fluid properties; Dimensional Analysis and Modeling; Fluid dynamics including flow kinematics and measurements; Flow net; Viscosity, Boundary layer and control, Drag, Lift, Principles in open channel flow, Flow controls. Hydraulic jump; Surges; Pipe networks. **(b)** Hydraulic Machines and Hydro power - Various pumps, Air vessels, Hydraulic turbines – types, classifications & performance parameters; Power house – classification and layout, storage, pondage, control of supply.

Subject Name	Syllabus
Hydrology and Water Resources Engineering	Hydrological cycle, Ground water hydrology, Well hydrology and related data analysis; Streams and their gauging; River morphology; Flood, drought and their management; Capacity of Reservoirs. Water Resources Engineering : Multipurpose uses of Water, River basins and their potential; Irrigation systems, water demand assessment; Resources - storages and their yields; Water logging, canal and drainage design, Gravity dams, falls, weirs, Energy dissipaters, barrage Distribution works, Cross drainage works and head-works and their design; Concepts in canal design, construction & maintenance; River training, measurement and analysis of rainfall.
Environmental Engineering	**(a)** Water Supply Engineering: Sources, Estimation, quality standards and testing of water and their treatment; Rural, Institutional and industrial water supply; Physical, chemical and biological characteristics and sources of water, Pollutants in water and its effects, Estimation of water demand; Drinking water Standards, Water Treatment Plants, Water distribution networks. **(b)** Waste Water Engineering: Planning & design of domestic waste water, sewage collection and disposal; Plumbing Systems. Components and layout of sewerage system; Planning & design of Domestic Waste-water disposal system; Sludge management including treatment, disposal and re-use of treated effluents; Industrial waste waters and Effluent Treatment Plants including institutional and industrial sewage management. **(c)** Solid Waste Management: Sources & classification of solid wastes along with planning & design of its management system; Disposal system, Beneficial aspects of wastes and Utilization by Civil Engineers. **(d)** Air, Noise pollution and Ecology: Concepts & general methodology.
Geo-technical Engineering and Foundation Engineering	**(a)** Geo-technical Engineering: Soil exploration - planning & methods, Properties of soil, classification, various tests and inter-relationships; Permeability & Seepage, Compressibility, consolidation and Shearing resistance, Earth pressure theories and stress distribution in soil; Properties and uses of geo-synthetics. **(b)** Foundation Engineering: Types of foundations & selection criteria, bearing capacity, settlement analysis, design and testing of shallow & deep foundations; Slope stability analysis, Earthen embankments, Dams and Earth retaining structures: types, analysis and design, Principles of ground modifications.
Surveying and Geology	**(a)** Surveying: Classification of surveys, various methodologies, instruments & analysis of measurement of distances, elevation and directions; Field astronomy, Global Positioning System; Map preparation; Photogrammetry; Remote sensing concepts; Survey Layout for culverts, canals, bridges, road/railway alignment and buildings, Setting out of Curves. **(b)** Geology: Basic knowledge of Engineering geology & its application in projects.
Transportation Engineering	Highways - Planning & construction methodology, Alignment and geometric design; Traffic Surveys and Controls; Principles of Flexible and Rigid pavements design. Tunneling - Alignment, methods of construction, disposal of muck, drainage, lighting and ventilation. Railways Systems – Terminology, Planning, designs and maintenance practices; track modernization. Harbours – Terminology, layouts and planning. Airports – Layout, planning & design.