

# DOWNLOAD PDF ENGINEERING SERVICES EXAMINATION SYLLABUS FOR CIVIL ENGINEERING

## Chapter 1 : Engineering Services Examination Syllabus

*Engineering Services Exam (IES/ESE ) Syllabus PRELIMINARY+MAINS (CIVIL ENGINEERING PAPER) As per the latest notification by UPSC total 3 stages will be there in Engineering Services Exam i.e Preliminary (Pre), Mains and Personality Test.*

Conservation, environmental pollution and degradation, Climate Change, Environmental impact assessment Basics of Project Management Basics of Material Science and Engineering Information and Communication Technologies ICT based tools and their applications in Engineering such as networking, e-governance and technology based education. Ethics and values in Engineering profession Note: The paper in General Studies and Engineering Aptitude will include Knowledge of relevant topics as may be expected from an engineering graduate, without special study. Questions from all the 10 topics mentioned above shall be set. Classification, properties and selection criteria; Cement: Properties and various Tests; Design of Concrete Mixes: Proportioning of aggregates and methods of mix 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. 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. 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. 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. Geo-technical Engineering and Foundation Engineering: 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. [Click Here](#) Leave a Comment.

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## Chapter 2 : Examination Syllabus | Engineers Canada

*Civil Engineering Syllabus for Main Examination Paper-I. 1. Engineering Mechanics, Strength of Materials and Structural Analysis: Engineering Mechanics: Units and Dimensions, SI Units, Vectors, Concept of Force, Concept of particle and rigid body.*

Concurrent, Non Concurrent and parallel forces in a plane, moment of force, free body diagram, conditions of equilibrium, Principle of virtual work, equivalent force system. First and Second Moment of area, Mass moment of Inertia. Kinematics in Cartesian Co-ordinates, motion under uniform and nonuniform acceleration, motion under gravity. Momentum and Energy principles, collision of elastic bodies, rotation of rigid bodies. Simple Stress and Strain, Elastic constants, axially loaded compression members, Shear force and bending moment, theory of simple bending, Shear Stress distribution across cross sections, Beams of uniform strength. Slopedeflection, moment distribution, Rolling loads and Influences lines: Influences lines for Shear Force and Bending moment at a section of beam. Criteria for maximum shear force and bending Moment in beams traversed by a system of moving loads. Influences lines for simply supported plane pin jointed trusses. Three hinged, two hinged and fixed arches, rib shortening and temperature effects. Matrix methods of analysis: Force method and displacement method of analysis of indeterminate beams and rigid frames. Plastic Analysis of beams and frames: Theory of plastic bending, plastic analysis, statical method, Mechanism method. Moment of inertia, product of inertia, position of Neutral Axis and Principle axes, calculation of bending stresses. Steel, Concrete and Masonry Structures: Factors of safety and load factors. Riveted, bolted and welded joints and connections. Design of tension and compression member, beams of built up section, riveted and welded plate girders, gantry girders, stanchions with battens and lacings. Concept of mix design. Compression members under direct load with or without eccentricity, Cantilever and Counter fort type retaining walls. Design requirements for Rectangular and circular tanks resting on ground. Methods and systems of prestressing, anchorages, Analysis and design of sections for flexure based on working stress, loss of prestress. Design of brick masonry as per I. Fluid properties and their role in fluid motion, fluid statics including forces acting on plane and curved surfaces. Kinematics and Dynamics of Fluid flow: Velocity and accelerations, stream lines, equation of continuity, irrotational and rotational flow, velocity potential and stream functions. Laminar flow between parallel, stationary and moving plates, flow through tube. Laminar and turbulent boundary layer on a flat plate, laminar sub layer, smooth and rough boundaries, drag and lift. Turbulent flow through pipes: Characteris-tics of turbulent flow, velocity distribution and variation of pipe friction factor, hydraulic grade line and total energy line. Uniform and non-uniform flows, momentum and energy correction factors, specific energy and specific force, critical depth, rapidly varied flow, hydraulic jump, gradually varied flow, classification of surface profiles, control section, step method of integration of varied flow equation. Hydraulic turbines, types classification, Choice of turbines, performance parameters, controls, characteristics, specific speed. Principles of hydropower development. Soil Type and structure - gradation and particle size distribution - consistency limits. Water in soil - capillary and structural - effective stress and pore water pressure - permeability concept - field and laboratory determination of permeability - Seepage pressure - quick sand conditions - Shear strength determination - Mohr Coulomb concept. Compaction of soil - Laboratory and field tests. Compressibility and consolidation concept - consolidation theory - consolidation settlement analysis. Earth pressure theory and analysis for retaining walls, Application for sheet piles and Braced excavation. Bearing capacity of soil - approaches for analysis - Field tests - settlement analysis - stability of slope of earth walk. Subsurface exploration of soils - methods Foundation - Type and selection criteria for foundation of structures - Design criteria for foundation - Analysis of distribution of stress for footings and pile - pile group action-pile load test. Construction Technology, Equipment, Planning and Management: Physical properties of construction materials with respect to their use in construction - Stones, Bricks and Tiles; Lime, Cement, different types of Mortars and Concrete. Specific

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use of ferro cement, fibre reinforced C. C, High strength concrete. Timber, properties and defects - common preservation treatments. Masonry principles using Brick, stone, Blocks - construction detailing and strength characteristics. Types of plastering, pointing, flooring, roofing and construction features. Common repairs in buildings. Principles of functional planning of building for residents and specific use - Building code provisions. Basic principles of detailed and approximate estimating - specification writing and rate analysis - principles of valuation of real property. Machinery for earthwork, concreting and their specific uses - Factors affecting selection of equipments - operating cost of Equipments. Construction activity - schedules-organization for construction industry - Quality assurance principles. Basic principles of Economic analysis and methods. Project profitability - Basic principles of Boot approach to financial planning - simple toll fixation criterions. Surveying and Transportation Engineering: Common methods and instruments for distance and angle measurement for CE work - their use in plane table, traverse survey, leveling work, triangulation, contouring and topographical map. Basic principles of photogrammetry and remote sensing. Permanent way - components, types and their functions - Functions and Design constituents of turn and crossings - Necessity of geometric design of track - Design of station and yards. Principles of Highway alignments - classification and geometrical design elements and standards for Roads. Pavement structure for flexible and rigid pavements - Design principles and methodology of pavements. Surface and sub-surface drainage arrangements for roads - culvert structures. Pavement distresses and strengthening by overlays. Traffic surveys and their applications in traffic planning - Typical design features for channelized, intersection, rotary etc - signal designs - standard Traffic signs and markings. Hydrology, Water Resources and Engineering: Hydrological cycle, precipitation, evaporation, transpiration, infiltration, overland flow, hydrograph, flood frequency analysis, flood routing through a reservoir, channel flow routing-Muskingam method. Specific yield, storage coefficient, coefficient of permeability, confined and unconfined equifers, aquifers, aquitards, radial flow into a well under confined and unconfined conditions. Ground and surface water resource, single and multipurpose projects, storage capacity of reservoirs, reservoir losses, reservoir sedimentation. Distribution systems for canal irrigation, canal capacity, canal losses, alignment of main and distributory canals, most efficient section, lined canals, their design, regime theory, critical shear stress, bed load. Design of, head regulators, canal falls, aqueducts, metering flumes and canal outlets. Types of dams, design, principles of rigid gravity, stability analysis. Spillway types, energy dissipation. Objectives of river training, methods of river training. Predicting demand for water, impurities of water and their significance, physical, chemical and bacteriological analysis, waterborne diseases, standards for potable water. Domestic and industrial wastes, storm sewage-separate and combined systems, flow through sewers, design of sewers. Standards of disposal in normal watercourse and on land. Working principles, units, chambers, sedimentation tanks, trickling filters, oxidation ponds, activated sludge process, septic tank, disposal of sludge, recycling of wastewater. Collection and disposal in rural and urban contexts, management of long-term ill effects. Radioactive wastes and disposal. Environmental impact assessment for thermal power plants, mines, river valley projects.

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## Chapter 3 : UPSC Civil Engineering Syllabus for - IAS Mains Optional Subjects

*Union Public Service Commission (UPSC) conducts Engineering Services Examination as a combined competitive examination for recruitment to the services or posts of Electrical Engineering, Civil Engineering, Mechanical Engineering, and Electronics and Telecommunication Engineering.*

Email This field is for validation purposes and should be left unchanged. Soil Type and structure – gradation and particle size distribution – consistency limits. Water in soil – capillary and structural – effective stress and pore water pressure – permeability concept – field and laboratory determination of permeability – Seepage pressure – quicksand conditions – Shear strength determination – Mohr-Coulomb concept. Compaction of soil – Laboratory and field tests. Compressibility and consolidation concept – consolidation theory – consolidation settlement analysis. Earth pressure theory and analysis for retaining walls, Application for sheet piles and Braced excavation. Bearing capacity of soil – approaches for analysis – Field tests – settlement analysis – stability of slope of earth work. Subsurface exploration of soils – methods Foundation – Type and selection criteria for the foundation of structures – Design criteria for foundation – Analysis of the distribution of stress for footings and pile – pile group action-pile load test. Physical properties of construction materials with respect to their use in construction – Stones, Bricks and Tiles; Lime, Cement, different types of Mortars and Concrete. Specific use of ferro cement, fibre reinforced C. C, High strength concrete. Timber, properties and defects – common preservation treatments. Masonry principles using Brick, stone, Blocks – construction detailing and strength characteristics. Types of plastering, pointing, flooring, roofing and construction features. Common repairs in buildings. Principles of functional planning of building for residents and specific use – Building code provisions. Basic principles of detailed and approximate estimating – specification writing and rate analysis – principles of valuation of real property. Machinery for earthwork, concreting and their specific uses – Factors affecting selection of equipments – operating cost of Equipments. Construction activity – schedules- organization for construction industry – Quality assurance principles. Basic principles of Economic analysis and methods. Project profitability – Basic principles of Boot approach to financial planning – simple toll fixation criterions. Surveying and Transportation Engineering: Common methods and instruments for distance and angle measurement for CE work – their use in plane table, traverse survey, leveling work, triangulation, contouring and topographical map. Basic principles of photogrammetry and remote sensing. Permanent way – components, types and their functions – Functions and Design constituents of turn and crossings – Necessity of geometric design of track – Design of station and yards. Principles of Highway alignments – classification and geometrical design elements and standards for Roads. Pavement structure for flexible and rigid pavements – Design principles and methodology of pavements. Surface and sub-surface drainage arrangements for roads – culvert structures. Pavement distresses and strengthening by overlays. Traffic surveys and their applications in traffic planning – Typical design features for channelized, intersection, rotary etc – signal designs – standard Traffic signs and markings. Hydrology, Water Resources and Engineering: Hydrological cycle, precipitation, evaporation, transpiration, infiltration, overland flow, hydrograph, flood frequency analysis, flood routing through a reservoir, channel flow routing-Muskingum method. Specific yield, storage coefficient, coefficient of permeability, confined and unconfined aquifers, aquifers, aquitards, radial flow into a well under confined and unconfined conditions. Ground and surface water resource, single and multipurpose projects, storage capacity of reservoirs, reservoir losses, reservoir sedimentation. Distribution systems for canal irrigation, canal capacity, canal losses, alignment of main and distribution canals, most efficient section, lined canals, their design, regime theory, critical shear stress, bed load. Design of, head regulators, canal falls, aqueducts, metering flumes and canal outlets. Types of dams, design, principles of rigid gravity, stability analysis. Spillway types, energy dissipation. Objectives of river training, methods of river training. Predicting demand for water, impurities of water and their significance,

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physical, chemical and bacteriological analysis, waterborne diseases, standards for potable water. Domestic and industrial wastes, storm sewage—separate and combined systems, flow through sewers, design of sewers. Standards of disposal in normal watercourse and on land. Working principles, units, chambers, sedimentation tanks, trickling filters, oxidation ponds, activated sludge process, septic tank, disposal of sludge, recycling of wastewater. Collection and disposal in rural and urban contexts, management of long-term ill effects. Radioactive wastes and disposal. Environmental impact assessment for thermal power plants, mines, river valley projects.

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## Chapter 4 : UPSC Engineering Services Examination Notification, Syllabus and more

*The research is all about the Engineering Services Exam Syllabus of Civil Engineering Indian Engineering Services is a combined four-stage competitive examination.*

Laminar flow between parallel, stationary and moving plates, flow through tube. Laminar and turbulent boundary layer on a flat plate, laminar sub layer, smooth and rough boundaries, drag and lift. Turbulent flow through pipes: Characteristics of turbulent flow, velocity distribution and variation of pipe friction factor, hydraulic grade line and total energy line. Uniform and non-uniform flows, momentum and energy correction factors, specific energy and specific force, critical depth, rapidly varied flow, hydraulic jump, gradually varied flow, classification of surface profiles, control section, step method of integration of varied flow equation. Hydraulic turbines, types classification, Choice of turbines, performance parameters, controls, characteristics, specific speed. Principles of hydropower development. Soil Type and structure – gradation and particle size distribution – consistency limits. Water in soil – capillary and structural – effective stress and pore water pressure – permeability concept – field and laboratory determination of permeability – Seepage pressure – quick sand conditions – Shear strength determination – Mohr Coulomb concept. Compaction of soil – Laboratory and field tests. Compressibility and consolidation concept – consolidation theory – consolidation settlement analysis. Earth pressure theory and analysis for retaining walls, Application for sheet piles and Braced excavation. Bearing capacity of soil – approaches for analysis – Field tests – settlement analysis – stability of slope of earth walk. Subsurface exploration of soils – methods Foundation – Type and selection criteria for foundation of structures – Design criteria for foundation – Analysis of distribution of stress for footings and pile – pile group action-pile load test. Construction Technology, Equipment, Planning and Management: Physical properties of construction materials with respect to their use in construction – Stones, Bricks and Tiles; Lime, Cement, different types of Mortars and Concrete. Specific use of ferro cement, fibre reinforced C. C, High strength concrete. Timber, properties and defects – common preservation treatments. Masonry principles using Brick, stone, Blocks – construction detailing and strength characteristics. Types of plastering, pointing, flooring, roofing and construction features. Common repairs in buildings. Principles of functional planning of building for residents and specific use – Building code provisions. Basic principles of detailed and approximate estimating – specification writing and rate analysis – principles of valuation of real property. Machinery for earthwork, concreting and their specific uses – Factors affecting selection of equipments – operating cost of Equipments. Construction activity – schedules- organization for construction industry – Quality assurance principles. Basic principles of Economic analysis and methods. Project profitability – Basic principles of Boot approach to financial planning – simple toll fixation criterions. Surveying and Transportation Engineering: Common methods and instruments for distance and angle measurement for CE work – their use in plane table, traverse survey, leveling work, triangulation, contouring and topographical map. Basic principles of photogrammetry and remote sensing. Permanent way – components, types and their functions – Functions and Design constituents of turn and crossings – Necessity of geometric design of track – Design of station and yards. Principles of Highway alignments – classification and geometrical design elements and standards for Roads. Pavement structure for flexible and rigid pavements – Design principles and methodology of pavements. Surface and sub-surface drainage arrangements for roads – culvert structures. Pavement distresses and strengthening by overlays. Traffic surveys and their applications in traffic planning – Typical design features for channelized, intersection, rotary etc – signal designs – standard Traffic signs and markings. Hydrology, Water Resources and Engineering: Hydrological cycle, precipitation, evaporation, transpiration, infiltration, overland flow, hydrograph, flood frequency analysis, flood routing through a reservoir, channel flow routing-Muskingam method. Specific yield, storage coefficient, coefficient of permeability, confined and unconfined equifers, aquifers, aquitards, radial flow into a well under confined and

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unconfined conditions. Ground and surface water resource, single and multipurpose projects, storage capacity of reservoirs, reservoir losses, reservoir sedimentation. Distribution systems for canal irrigation, canal capacity, canal losses, alignment of main and distributory canals, most efficient section, lined canals, their design, regime theory, critical shear stress, bed load. Design of, head regulators, canal falls, aqueducts, metering flumes and canal outlets. Types of dams, design, principles of rigid gravity, stability analysis. Spillway types, energy dissipation. Objectives of river training, methods of river training. Predicting demand for water, impurities of water and their significance, physical, chemical and bacteriological analysis, waterborne diseases, standards for potable water. Domestic and industrial wastes, storm sewage – separate and combined systems, flow through sewers, design of sewers. Standards of disposal in normal watercourse and on land. Working principles, units, chambers, sedimentation tanks, trickling filters, oxidation ponds, activated sludge process, septic tank, disposal of sludge, recycling of wastewater. Collection and disposal in rural and urban contexts, management of long-term ill effects. Radioactive wastes and disposal. Environmental impact assessment for thermal power plants, mines, river valley projects.

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## Chapter 5 : Download Maharashtra Engineering Services Syllabus & Pattern

*In UPSC Civil Services Mains Exam, Civil Engineering is one of the Optional Subjects and consists of 2 papers. Each paper is of marks with a total of marks. Find below the UPSC Syllabus for Civil Engineering Optional Subject.*

Therefore, making a total of marks. Concurrent, Non Concurrent and parallel forces in a plane, moment of force, free body diagram, conditions of equilibrium, Principle of virtual work, equivalent force system. First and Second Moment of area, Mass moment of Inertia. Kinematics in Cartesian Co-ordinates, motion under uniform and nonuniform acceleration, motion under gravity. Momentum and Energy principles, collision of elastic bodies, rotation of rigid bodies. Simple Stress and Strain, Elastic constants, axially loaded compression members, Shear force and bending moment, theory of simple bending, Shear Stress distribution across cross sections, Beams of uniform strength. Macaulay s method, Mohr s Moment area method, Conjugate beam method, unit load method. Castigliano s theorems I and II, unit load method of consistent deformation applied to beams and pin jointed trusses. Slopedeflection, moment distribution, Rolling loads and Influences lines: Influences lines for Shear Force and Bending moment at a section of beam. Criteria for maximum shear force and bending Moment in beams traversed by a system of moving loads. Influences lines for simply supported plane pin jointed trusses. Three hinged, two hinged and fixed arches, rib shortening and temperature effects. Matrix methods of analysis: Force method and displacement method of analysis of indeterminate beams and rigid frames. Plastic Analysis of beams and frames: Theory of plastic bending, plastic analysis, statical method, Mechanism method. Moment of inertia, product of inertia, position of Neutral Axis and Principle axes, calculation of bending stresses. Steel, Concrete and Masonry Structures: Factors of safety and load factors. Riveted, bolted and welded joints and connections. Design of tension and compression member, beams of built up section, riveted and welded plate girders, gantry girders, stanchions with battens and lacings. Concept of mix design. Compression members under direct load with or without eccentricity, Cantilever and Counter fort type retaining walls. Design requirements for Rectangular and circular tanks resting on ground. Methods and systems of prestressing, anchorages, Analysis and design of sections for flexure based on working stress, loss of prestress. Design of brick masonry as per I. Fluid properties and their role in fluid motion, fluid statics including forces acting on plane and curved surfaces. Kinematics and Dynamics of Fluid flow: Velocity and accelerations, stream lines, equation of continuity, irrotational and rotational flow, velocity potential and stream functions. Continuity, momentum and energy equation, Navier-Stokes equation, Euler s equation of motion, application to fluid flow problems, pipe flow, sluice gates, weirs. Buckingham s Pi-theorem, dimensionless parameters. Laminar flow between parallel, stationary and moving plates, flow through tube. Laminar and turbulent boundary layer on a flat plate, laminar sub layer, smooth and rough boundaries, drag and lift. Turbulent flow through pipes: Characteris-tics of turbulent flow, velocity distribution and variation of pipe friction factor, hydraulic grade line and total energy line. Uniform and non-uniform flows, momentum and energy correction factors, specific energy and specific force, critical depth, rapidly varied flow, hydraulic jump, gradually varied flow, classification of surface profiles, control section, step method of integration of varied flow equation. Hydraulic turbines, types classification, Choice of turbines, performance parameters, controls, characteristics, specific speed. Principles of hydropower development. Soil Type and structure gradation and particle size distribution consistency limits. Water in soil capillary and structural effective stress and pore water pressure permeability concept field and laboratory determination of permeability Seepage pressure quick sand conditions Shear strength determination Mohr Coulomb concept. Compaction of soil Laboratory and field tests. Compressibility and consolidation concept consolidation theory consolidation settlement analysis. Earth pressure theory and analysis for retaining walls, Application for sheet piles and Braced excavation. Bearing capacity of soil approaches for analysis Field tests settlement analysis stability of slope of earth walk. Subsurface exploration of soils methods Foundation Type and selection criteria for foundation of structures Design criteria for foundation Analysis of distribution of



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stress for footings and pile pile group action-pile load test. Construction Technology, Equipment, Planning and Management: Physical properties of construction materials with respect to their use in construction - Stones, Bricks and Tiles; Lime, Cement, different types of Mortars and Concrete. Specific use of ferro cement, fibre reinforced C. C, High strength concrete. Timber, properties and defects - common preservation treatments. Masonry principles using Brick, stone, Blocks construction detailing and strength characteristics. Types of plastering, pointing, flooring, roofing and construction features. Common repairs in buildings. Principles of functional planning of building for residents and specific use - Building code provisions. Basic principles of detailed and approximate estimating - specification writing and rate analysis principles of valuation of real property. Machinery for earthwork, concreting and their specific uses Factors affecting selection of equipments operating cost of Equipments. Construction activity schedules- organization for construction industry Quality assurance principles. Basic principles of Economic analysis and methods. Project profitability Basic principles of Boot approach to financial planning simple toll fixation criterions. Surveying and Transportation Engineering: Common methods and instruments for distance and angle measurement for CE work their use in plane table, traverse survey, leveling work, triangulation, contouring and topographical map. Basic principles of photogrammetry and remote sensing. Permanent way components, types and their functions Functions and Design constituents of turn and crossings Necessity of geometric design of track Design of station and yards. Principles of Highway alignments classification and geometrical design elements and standards for Roads. Pavement structure for flexible and rigid pavements - Design principles and methodology of pavements. Surface and sub-surface drainage arrangements for roads - culvert structures. Pavement distresses and strengthening by overlays. Traffic surveys and their applications in traffic planning - Typical design features for channelized, intersection, rotary etc signal designs standard Traffic signs and markings. Hydrology, Water Resources and Engineering: Hydrological cycle, precipitation, evaporation, transpiration, infiltration, overland flow, hydrograph, flood frequency analysis, flood routing through a reservoir, channel flow routing-Muskingam method. Specific yield, storage coefficient, coefficient of permeability, confined and unconfined equifers, aquifers, aquitards, radial flow into a well under confined and unconfined conditions. Ground and surface water resource, single and multipurpose projects, storage capacity of reservoirs, reservoir losses, reservoir sedimentation. Distribution systems for canal irrigation, canal capacity, canal losses, alignment of main and distributory canals, most efficient section, lined canals, their design, regime theory, critical shear stress, bed load. Design of, head regulators, canal falls, aqueducts, metering flumes and canal outlets. Principles and design of weirs of permeable and impermeable foundation, Khosla s theory, energy dissipation. Types of dams, design, principles of rigid gravity, stability analysis. Spillway types, energy dissipation. Objectives of river training, methods of river training. Predicting demand for water, impurities of water and their significance, physical, chemical and bacteriological analysis, waterborne diseases, standards for potable water. Domestic and industrial wastes, storm sewage separate and combined systems, flow through sewers, design of sewers. Standards of disposal in normal watercourse and on land. Working principles, units, chambers, sedimentation tanks, trickling filters, oxidation ponds, activated sludge process, septic tank, disposal of sludge, recycling of wastewater. Collection and disposal in rural and urban contexts, management of long-term ill effects. Radioactive wastes and disposal. Environmental impact assessment for thermal power plants, mines, river valley projects.

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## Chapter 6 : UPSC Engineering services syllabus for ME, EE, Civil and all

*Civil Engineering Syllabus - Civil Services Mains Exam UPSC: UPSC Civil Services Mains Exam Optional Subject consists of 2 papers. Each paper is of marks, making a total of marks.*

This exam will be of marks and this is the compulsory exam and will be common to all branch. Civil Engineering Preliminary Engineering Discipline paper will be of 3 hours with maximum marks. It will be objective paper. Students have to first clear preliminary stage I then only they will be able to go to Stage II i. The questions from the following Topics will be set in Paper 1 Building Materials: Classification, properties and selection criteria; Cement: Properties and various Tests; Design of Concrete Mixes: Proportioning of aggregates and methods of mix 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. 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. 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. 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. Geo-technical Engineering and Foundation Engineering: 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.

## Chapter 7 : Civil Engineering Syllabus " Civil Services Mains Exam UPSC - Clear IAS

*Download UPSC Engineering Services Syllabus for Civil, Electrical, Mechanical, ECE Exam Pattern IES Syllabus IES (Indian Engineering Services) is one of the toughest and most sought after careers for engineering graduates in India.*

## Chapter 8 : Mains Syllabus of Civil Engineering, Detailed UPSC Syllabus of Civil Engineering, IAS

*2. Civil Engineering. Contents for syllabus of both the Papers together for Stage-I objective type Paper-II and separately for Stage-II Conventional type Paper-I and Paper - II.*

## Chapter 9 : IES Civil Engineering Syllabus - Pattern PDF download

*Engineering Services Examination commonly known as ESE is conducted annually by UPSC to recruit engineers of four domains i.e. Civil, Mechanical, Electrical and Electronics & Telecommunications for the Techno-Managerial posts.*