

Civil Engineering (CE)

Detailed subject and topic catalogue for Quick Revision, Topic-wise Tests, Combined Practice and 10 Full-Length Mocks.

Source: official GATE 2027 CE syllabus, IIT Madras. Topic descriptions below are concise paraphrases organized for a practice-test database; always cross-check the official PDF.

01 Engineering Mathematics

Linear Algebra

Matrices, linear systems, eigenvalues and eigenvectors

Calculus

Limits, derivatives, integrals, vector calculus

ODE and PDE

First/higher order ODE, Fourier series, diffusion/wave/Laplace equations

Probability and Statistics

Probability, distributions, regression and descriptive statistics

Numerical Methods

Error analysis, interpolation, numerical roots, integration and ODE methods

02 Structural Engineering

Engineering Mechanics

Forces, equilibrium, friction, centre of mass

Solid Mechanics

Stress/strain, Mohr circle, bending, torsion, buckling

Structural Analysis

Deflections, energy methods, determinate/indeterminate structures, influence lines, stiffness matrix

Concrete Structures

Limit state and working stress design, beams, slabs, columns, footings, anchorage

Steel Structures

Tension/compression members, beams, connections, column bases, plastic analysis

03 Geotechnical Engineering

Soil Properties and Classification

Phase relationships, index properties, soil classification

Seepage and Consolidation

Permeability, flow nets, effective stress, compaction, consolidation

Shear Strength and Investigation

Mohr circle, shear parameters, SPT/CPT, subsurface investigation

Earth Pressure and Slopes

Rankine/Coulomb, slope stability, sheet piles

Foundations and Ground Improvement

Bearing capacity, settlement, shallow/deep foundations, piles, ground improvement

04 Water Resources Engineering

Fluid Mechanics

Fluid statics, conservation laws, laminar/turbulent flow, pipes, boundary layers

Hydraulics

Open channel flow, specific energy, hydraulic jumps, weirs, dimensional analysis

Hydrology

Rainfall, infiltration, hydrographs, floods, groundwater, Darcy law

Irrigation

Crop water requirements, canals, dams, spillways, drainage structures

05 Environmental Engineering

Water and Wastewater

Water quality, treatment processes, distribution, sewerage, sewage treatment and reuse

Air Pollution

Pollutants, standards, control and air quality index

Solid Waste

Collection, recycling, treatment, landfill design

06 Transportation Engineering

Transportation Infrastructure

Highway geometry, railway track, runway and taxiway design

Highway Pavements

Materials, bituminous mixes, flexible/rigid pavement design

Traffic Engineering

Traffic studies, flow, signs, signals, intersections and capacity

Transportation Planning

Four-step demand modelling and traffic assignment

07 Geomatics Engineering

Surveying

Plane/geodetic survey, GNSS, levelling, traversing, total station, projections

Photogrammetry

Photographic scale, parallax, camera calibration, digital photogrammetry

08 Construction Materials and Management

Construction Materials

Steel, cement, admixtures, concrete properties and mix design

Construction Management

Estimation, costing, PERT/CPM, scheduling, equipment and contracts

Shared module: General Aptitude (GA)

Verbal aptitude, quantitative aptitude, analytical aptitude and spatial aptitude. GA is common to all GATE papers; use the official GA syllabus for the complete detail.

Official source: https://gate2027.iitm.ac.in/static/doc/GATE2027_Syllabus/CE_GATE2027_Syllabus.pdf

Database recommendation: branch_code > section > topic > subtopic > question type > difficulty > marks > revision note.