CSS COURSE SYLLABUS

Geology

100 marks · one paper · Group II - Sciences & Mathematics

Complete Geology syllabus. The full official FPSC syllabus this course covers, section by section.

PART- I (50 MARKS)

1 Introduction to Physical Geology

- Introduction and scope of geology, its importance and relationship with other sciences; Earth as a member of the solar system: its origin, age, composition and internal structure; Introduction to rocks and minerals; Weathering and erosion;
- Isostasy; Geological Time Scale.

2 Stratigraphy and Paleontology

- Principles of stratigraphy; Laws of superposition and faunal succession; Geological time scale with divisions; Classification and nomenclature of stratigraphic units: lithostragraphic units, biostratigraphic units and chronostratgraphic units.
- Introduction to fossils and their significance; Modes of fossilization; Study of morphology, range and broad classification of major invertebrate phyla; Introduction to micro fossils; Introduction to Paleobotany; Introduction and classification of major vertebrates; Introduction to micropaleontology

3 Mineralogy

- Classification of minerals; Study of internal structure; Polymorphism and isomorphism; Paragenesis; Physical and optical properties of the common silicate and non-silicate mineral groups; Introduction to crystallography: elements of symmetry, study; normal classes of crystallographic systems.

4 Structural Geology and Tectonics

- Stress-strain concepts; factors controlling the mechanical behavior of materials;
- Folds; Faults; Joints; Foliation: terminology, classification and relationship with bedding; Lineation; Unconformity.
- Plate tectonics theory; Geological evidences for continental drift; Sea-floor spreading; Oceanic ridges; Continental rifts; Intra-oceanic islands; Hot spot and Mantle plumes; Wilson Cycle; Tectonic framework of Pakistan.

5 Petrology and Petrography

- Introduction, classification and description of sedimentary rocks; origin; transportation and deposition of sediments; Texture of sedimentary rocks;
- Sedimentary structures, their classification, morphology and significance;
- Composition, origin, differentiation and evolution of magma; Classification of igneous rocks; Mode of occurrences and types of extrusive rocks; Texture and structure of igneous rocks; Introduction to metamorphism; Types of metamorphism;
- Grades, zones and facies of metamorphism; Metamorphic diffusion and differentiation; Metamorphism in relation to Plate Tectonics; Differentiation between metamorphism and metasomatism.

Downloaded from cssprep.ai · WhatsApp +92 323 7805323

- Introduction to Polarizing Microscope; Optical properties of opaque and non-opaque minerals in plane polarized light and under crossed nicol including metallic under reflected light; Description of optical properties of common rock forming minerals.

PART- II (50 MARKS)

6 Introduction to Geophysics

- Definition and relation of geophysics with other sciences; Classification and brief description of various branches of geophysics such as seismology, geomagnetism, geoelectricity, tectonophysics, gravimetry, geo-thermy and geodesy; Introduction to various geophysical techniques for exploration of mineral deposits, oil and gas, subsurface water and engineering works.

7 Sequence Stratigraphy

- Introduction: history, concept and significance of sequence stratigraphy; Data sources: seismic reflections, outcrops, well logs, core and seismic facies;
- Sea level changes: their causes and effects, accommodation, eustatic and relative sea curve; Hierarchy of sequence stratigraphic elements; Types of sequences and systems tracts.

8 Petroleum Geology

- The nature and classification of petroleum hydrocarbons, their origin, migration and accumulation; Source sediments, reservoir rocks and trapping mechanism for oil and gas; Prospecting and exploration of oil and gas; Reservoir: characteristics, drive mechanism, energy and pressure maintenance; Secondary and enhanced recovery;
- Introduction to Sedimentary Basins of Pakistan.

9 Engineering and Environmental Geology

- Rock and soil mechanics and its application in civil engineering; Rock mass characteristics; Geotechnical studies of rocks and soils; Geological factors and strength of rocks; Study of geological factors in relation to the construction of buildings' foundations, roads, highways, tunnels, dams and bridges; Application of geophysical methods for site investigation; Construction materials; Mass movement: their causes and prevention.
- Introduction to environmental geology; Management of natural resources; Global climatic changes; Environmental controls for erosion, desertification and coastal degradation; Geological hazards such as floods, landslides, earthquakes, tsunamis, volcanoes, glaciers and shoreline processes; Remedial measures; Clean sources of energy; Industrial pollution, solid and liquid waste disposal, Introduction to environmental impact assessment and initial environmental examination.

10 Mineral and Energy Resources

- Introduction of geological exploration/prospecting. Brief description of hydrocarbons, coal, gemstones, copper, lead, zinc, iron, gold, chromite, manganese, salt, gypsum, bauxite, sulphur, barite, fluorite, clays, phosphorite, building and dimension stones; Industrial rocks and minerals; Radioactive minerals and rocks; Special reference to economic mineral deposits in Pakistan.
- Origin, occurrence, and depositional environments of coal; Coal constitution and its kinds; Coal rank, grade and calorific value; Coal deposits of Pakistan with reference to Thar Coal; Geothermal energy resources of Pakistan.

CSSPrep.AI cssprep.ai WhatsApp +92 323 7805323

11 Economic and Applied Geology

- Metallic and Non-metallic mineral resources of Pakistan; Mineral-based industries.
- Overview of Recodec Copper; Radioactive minerals and their occurrences in Pakistan; Gemstones of Pakistan.
- Geology of Reservoirs, dams, highways and tunnels; Major natural hazards and their impacts on the environment with special reference to Pakistan.

Source: Revised Syllabi for CSS Competitive Examination, CE-2016 (updated 7 July 2015), Federal Public Service Commission.

Practise answers on this syllabus and get them marked out of 20 at **cssprep.ai**. Questions? WhatsApp **+92 323 7805323**.

CSSPrep.AI
cssprep.ai
WhatsApp +92 323 7805323