Dr. K. N. Modi University

Department of Civil Engineering

Syllabus for Entrance Exam in Civil Engineering:

The Ph.D. Programs, in Full-time (FT) and Part-time (PT) modes, in Civil Engineering department are offered in the following Specialized areas:
The following is the syllabus for the written test.

1. Structural Engineering
Structural Mechanics - Analysis of Flexure, Torsion, Shear, Compression and Tension - Analysis of Structures-Force and Stiffness methods - Concrete making materials and Technology- Design of Concrete , Steel Structures- Plastic analysis and design-Prestressed Concrete- simple and continuous beams- Structural Dynamics- Analysis of Free and Forced vibrations-Damping- Seismic design- Modal analysis-Finite Element method - Theory of Elasticity-Analysis of Stress and Strain.
2. Water Resources Engineering
Fluid Mechanics-Continuity, Momentum and Energy equations- Potential flow- Laminar and Turbulent flow- Flow in Pipes-Boundary layer- Hydraulics-Energy depth relations-Specific Energy-Gradually varied flow-Unsteady free surface flow- Hydrologic Cycle-Precipitation, Evaporation, Watershed, Flood routing, Surface run-off models-Well hydraulics-Hydrograph analysis- Irrigation-Duty, Delta, Crop water requirements-Design of lined and un-lined canals.
3. Environmental Engineering
Water and Waste water-Water standards-Surface water treatment-Distribution of water- Sewage and Sewerage treatment-Primary, secondary and tertiary treatment of waste water-Effluent discharge standards- Air pollution-air quality standards- Noise pollution-control and measurement-Municipal solid waste- characteristics-collection and transportation-Engineered systems for solid waste management.

4. Geotechnical Engineering
Engineering properties of soils- Compaction and Consolidation-Foundation engineering- types of foundations – Shallow foundations -bearing capacity theories-Deep foundations; Earth pressure theories and earth retaining structures; Soil dynamics- free and forced vibrations; Rock mechanics-rock mass classification- laboratory and In-situ testing- foundations on rock-tunneling. Soil exploration- sampling, drilling, in-situ tests- bore logs
5. Transportation Engineering
Urban transportation problems, travel demand estimation, Trip Generation & distribution models, mode split analysis, traffic assignment, corridor identification, stated preference methods, components of traffic system, traffic studies, microscopic & macroscopic traffic stream models, highway capacity, geometric design of traffic flow systems, design of at grade intersections, parking facilities, bicycle & pedestrian facilities-stresses in flexible & rigid pavements, design of flexible & rigid pavements, highway construction equipment, pavement construction, Evaluation of pavements, Pavement Maintenance.
6. Remote Sensing and GIS
Remote sensing - Principles and fundamentals of Image Processing; Geographical Information Systems-Fundamentals and Advances, Surveying-Advances and GNSS, Photogrammetry -principles and applications
7. Construction Technology and Management
Project Planning & Management-Network Scheduling-PERT, CPM Construction Techniques-RC & PSC, Modular construction practice-Construction Economics & Finance-Depreciation, Project appraisal Quantitative Methods in Construction Management-Linear and Dynamic programming-Construction Methods& Equipment- Equipment for Earth moving, Material transport, Pile driving, dewatering-Contract Management & Arbitration- types of contracts, disputes-Construction Materials-Concrete, polymers, Sealants