

Medicaps University

Syllabus for Ph. D. Entrance Exam in Civil Engineering

- 1. Structural Mechanics:** Bending moment in statically determinate beams, Buckling of columns, Combined and direct bending stresses, Flexural and shear stresses, Principal stresses, Shear centre, Shear force in statically determinate beams, Simple bending theory, Simple stress and strain relationship, Stress and strain in two dimensions, Uniform torsion, Unsymmetrical bending
- 2. Theory of Structures:** Analysis by displacement methods, Analysis of arches, beams, cables and frames, Analysis of beam sections at transfer and service loads, Analysis of statically determinate structures, Slope & deflection, Moment distribution methods, Analysis of statically indeterminate structures by force/displacement methods, Displacements in statically determinate and indeterminate structures, Influence lines for determinate and indeterminate structures, Analysis of ultimate load capacity, Basics of Dynamic analysis of structures.
- 3. Concrete Technology and Design of R.C.C.:** Basics of mix design, Fiber reinforced concrete, High strength/performance concrete, Limit state design concepts with Design of Concrete Structures by limit state methods, R.C.C. design- basic working stress, Basic elements of prestressed concrete, Non-destructive testing of concrete, Special concretes such as self compacting concrete.
- 4. Steel Structures:** Analysis and design of tension and compression members, Beam column connections, Beams and beam- columns, Column bases, Connections- simple and eccentric, Plastic analysis of beams and frames, Plate girders and trusses.
- 5. Building Construction:** Arches and Lintels, Brick Masonry, Plastering and Pointing, Stairs and Staircases, Stone Masonry, Walls, White washing.
- 6. Foundation Engineering:** Deep Foundations, Dynamic & static formulae, Earth pressure theories, Effect of water table, Finite slopes, Foundation types- foundation design requirements, Layered soils, Load capacity of piles in sands & clays, Negative skin friction, Penetration tests, Pile types, Plate load tests, Settlement analysis in sands & clays, Shallow foundations bearing capacity, Stability of slopes- infinite slopes, Stress distribution, Sub-surface investigations.