**CE/BOS/CE 304/0210**

# K L UNIVERSITY

## DESIGN OF CONCRETE STRUCTURES (09-CE304)

| L | T | P | Cr |
|---|---|---|---|
| 3 | 1 | 2 | 5 |

**SYLLABUS**

**UNIT – 1** **Introduction**: Introduction, working stress method, Code recommendations for Limit state design

**Limit State of Collapse-Flexure:** Introduction, Analysis at Ultimate Limit state, Assumptions in analysis, Analysis of Singly and doubly reinforced rectangular sections, Analysis of Flanged sections, Design of Singly and doubly reinforced rectangular sections. Design of Flanged Beam sections

**UNIT – II** **Design for Shear, Torsion, Bond and Deflection:** Shear stresses in rectangular beams, Shear failure modes, normal shear stress, design shear strength with and without shear reinforcement, Design for torsion of rectangular section. Design for bond, mechanism of bond resistance, Serviceability limit states: deflection and cracking, short term and Long term deflection.

**Design of Slabs:** Introduction, Effective span for slabs, Design of Continuous One-way slab, Two-way slab: restrained slabs and unrestrained slabs, Introduction to Flat slabs.

**UNIT – III** **Design of Compression Members:** Introduction, Classification of columns, Effective length of column, slenderness limits, minimum eccentricities and reinforcement, Design of Short columns under axial compression, compression with uniaxial and Biaxial bending, Design of slender columns.

**UNIT – IV** **Design of Foundations:** Introduction, Types of footing, Depth of foundation, Design of Isolated footings, Design of combined footing.

**UNIT – V** **Prestressed Concrete:**

**Introduction:** Basic concepts of prestressing; Historical development; Need for High strength steel and high strength concrete; Advantages of prestressed concrete.

**Prestressing Systems & Analysis:** Tensioning devices; Hoyer's long line system of pretensioning; Post tensioning systems; Basic assumptions; Analysis of prestress; Resultant stresses at a section;

**TEXT BOOKS: supplemented with IS: 456-2000**

1. Reinforced Concrete Design by S.Unnikrishna Pillai and Devdas Menon, Tata McGraw-Hill, Education Private Limited, New Delhi, Third Edition-2009**.**
2. Prestressed Concrete by N. Krishna Raju; Tata Mc Graw - Hill Publishing Company Limited Delhi.

**REFERENCE BOOKS:**

1. Limit State theory & Design of reinforced concrete by V. L. Shah and Dr. S. R. Karve, Structures Publications, Pune, Fourth Edition-2003.
2. Design of concrete structures by Arther H.Nilson, Tata Mc Graw-Hill Publishing Co. Ltd, New Delhi.

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**LIST OF EXPERIMENTS**

| L | T | P | Cr |
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Students are required to design of the following structures using STRUDS Software

1. Design of continuous beam.
2. Design of plane frame.
3. Design of space frame.
4. Design of G+4 Residential building : Creating model from the given drawing
5. Design of G+4 Residential building : Assigning Loads and Load Combinations
6. Design of G+4 Residential building : Slabs
7. Design of G+4 Residential building : Beams
8. Design of G+4 Residential building : Column
9. Design of G+4 Residential building : Footing
10. Design of G+4 Residential building : Preparation of Design Documents and detail drawing