RK.UNIVERSITY

SYLLABUS

Basics of Civil Engineering
CV107
Lecture : 02
Practical : 01
Tutorial : 00
Total : 03

Course Outcomes

After Successful completion of the above course, students will be able to:

1. **Apply** pertinent mathematical, physical and engineering mechanical principles to the system to **solve** and **analyze** the problems.
2. **Understand** scope of various branches of Civil engineering and r**ecognize** the role of Civil engineer in infrastructure development.
3. **Distinguish** various buildings based upon occupancy and types of structure.
4. **Understand** various tests on building materials, **apply** and interpret test data to adopt suitable materials for conventional building construction.

Detailed Syllabus

Name of Chapter & Details
Section – I
Introduction: Impact of Infrastructural Development on the Economy of a Country, Role of Civil Engineers, Branches of civil engineering, Scope of civil engineering

Construction Materials:

Requirement, types, uses, properties and importance of Civil Engineering materials like Stone, Bricks, Lime, Cement, Timber, Sand, Aggregate, Mortar and Concrete.

Building Construction:

Classification of buildings based upon occupancy and structure, Common building components, their functions, and nominal dimensions. Introduction to Tall structures and special structures.

Section – II

Introduction:

Scalar and Vector Quantities, composition and resolution of vectors, system of units, definition of space, time, particle, rigid body, force.

Fundamentals of statics:

Principles of statics, coplanar, concurrent and non-concurrent, parallel and non-parallel forces, composition and resolution of forces, moments & couples - their properties, Combination of coplanar couples and forces, equilibrant, equilibrium, free body diagrams, analytical conditions of equilibrium for coplanar force systems

Support Reactions:

Types of loads, Types of supports, Types of beams; Determination of support reactions.

Term Work: Term work shall be based on the above mentioned course content.

Instructional Method and Pedagogy

- Lectures will be conducted with the aid of multi-media projector, blackboard, OHP etc.
- Assignments based on course content will be given to the students at the end of each unit/topic and will be evaluated at regular interval.
- Surprise tests/Quizzes/Seminar/Tutorials will be conducted.
- The course includes field work, where students have an opportunity to build an

List of Experiments:

1. **Validate** law of parallelogram of forces.
2. **Validate** law of polygon of forces.
3. **Validate** for equilibrium condition of coplanar and non-concurrent forces.
4. **Determine** support reactions for beam.
5. **Measure** and **record** dimension of a brick sample.
6. **Determine** water absorption of a brick sample
7. **Determine** efflorescence of a brick sample.
8. **Determine** moisture content of a timber sample.
9. **Determine** unit weight of a timber sample.

List of Mini Projects:

1. **Prepare** scaled drawing containing plan, elevation and cross section for centre line layout of a sample building.
2. **Present** a poster related to any of topic covered in syllabus.

Reference Books:

1. S.K. Duggal, Building Materials, 4th Edition, New Delhi :New Age International (P) Ltd., Publishers, 2012 (Reprint : 2014)
2. S.C. Rangwala, Engineering Materials, 14th Edition, Anannd: Charotar Publishing House Pvt. Ltd., 2013.
3. Dr. B.C.Punmia, Ashok Kr. Jain, Arun Kr. Jain, Building Construction, 10th Edition, New Delhi : Laxmi Publications(P) Ltd., 2012
4. J.L. Meriam, L.G. Kraige, Engineering Mechanics: Statics Volume-1 - SI Version, 17th Edition, New Delhi :Wiley India Pvt. Ltd., 2013
5. R.C. Hibbeler, Ashok Gupta, Engineering Mechanics - Statics and Dynamics, 11th Edition, Delhi: Pearson Education India,2009
6. S. B. Junnarkar, H. J. Shah, Mechanics of Structures Vol 1 (Strength of Material), 30th Edition, Anannd: Charotar Publishing House Pvt. Ltd., 2012.

Additional Resources:

N.P.T.E.L. Lecture Series

- Prof. Y. Nath, IIT Delhi, http://nptel.ac.in/courses/105102090/
- Prof. M.S. Sivakumar, IIT Madras, http://nptel.ac.in/courses/105106116/

Websites:

- www.asce.org
- www.engineeringcivil.com