Annexure 2

BASIC CIVIL ENGINEERING & APPLIED MECHANICS

Course Code: CIV 101 **Credit Units: 02**

Total Hours: 20

Course Objectives:

- To understand the utility of various types of building materials.
- To understand the location, construction detail and suitability of various building elements.
- To determine the location of object on ground surface.
- To understand the effects of system of forces on rigid body in static conditions.
- Introduction to smart city and its component.

Course contents:

Module I: Building Materials: (4 Hours)
Stones, bricks, cement, timber - types, properties, test & uses, Introduction of concrete properties & Laboratory tests on concrete, curing of concrete and mortar Materials.

Module II: Surveying & Positioning: (4 Hours)
Introduction to surveying, Survey stations, Measurement of distances; conventional and EDM methods, Measurement of directions by different methods, Measurement of elevations by different methods, reciprocal levelling.

Module III: Smart City: (4 Hours)
Elements of smart city, Role of experts of various discipline of engineering in the development of smart city. Concept of green buildings, including rainwater harvesting, non-conventional sources of energy, Smart transportation and drainage system.

Module IV: Forces and Equilibrium: (4 Hours)
Graphical and Analytical Treatment of Concurrent and non-concurrent coplanar forces, free body Diagram, Force Diagram and Bow's notations, Application of Equilibrium Concepts: Analysis of plane Trusses, method of joints, method of Sections.

Module V: Centre of Gravity and moment of Inertia: (4 Hours)
Centroid and Centre of Gravity, Moment of Inertia of Composite section. Support Reactions, Shear force and bending moment diagram for cantilever & simply supported beam with concentrated, distributed load and Couple.

Course Outcomes:

Upon completion of the course, the students will be able to:

- Explain concepts and terminologies of building materials, surveying and mechanics.
- Apply various methods for surveying and mechanics.
- Determine the location, area and volume of objects on ground surface.
- Solve the problems of surveying and mechanics by using various methods.
- Analyse the effects of system of forces on rigid bodies in static conditions.

Examination Scheme:

Components	A	CT	S/V/Q/HA	EE
Weightage (%)	5	15	10	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; A: Attendance

Text & References:

- Surveying, Vol. – 1, Punmia B.C., Laxmi Publications, 17th edition, 2016
- Building Material, B. C. Punmia, Laxmi Publications,2016
- A textbook of Engineering Mechanics, D. S. Kumar, Katsons Publications, 2013
- Basic Civil Engineering, S. Ramamrutam & R. Narayan, Dhanpat Rai Pub., 3rd edition, 2013
- Applied Mechanics, Prasad I.B., Khanna Publication 17th edition, 1996
- Surveying, Duggal, Tata McGraw Hill New Delhi, 4th edition, 2013
- Engineering Mechanics - Statics & Dynamics, R.C. Hibbler, Pearson Publications, 14th edition, 2015
- Engineering Mechanics - statics dynamics, A. Boresi & Schmidt, Cengage learning,1st edition, 2008.
- Applied Mechanics, R.K. Rajput, Laxmi Publications, 3rd edition, 2016