Semester: I/II			
Course Title	Introduction to Civil Engineering	**CIE Marks**	50
Course Code	BCVESC104/204A	**SEE Marks**	50
Course Type	Theory	**Total Marks**	100
Course Category	ESC	**SEE Duration**	03 hrs
Hours Per Week	2L: 2T: 0P	**SEE Type**	Written
Total Hours	40 hrs	**Credits**	03

Course Learning Objectives
This course will enable the students to
• Learn the scope of various fields of civil engineering, basic materials for construction and structural elements of building.
• Learn the impact of infrastructure on global environment.
• Develop the ability to analyze the problems involving forces and moments in concurrent and non-concurrent force systems.
• Develop the ability to compute the centroid and moment of inertia of built-up sections.
Pre-Requisites
• Basic laws of physics, algebra, geometry and trigonometry, SI units

Module-1: Civil Engineering Disciplines and Building Science	**(8 hrs)**
Civil Engineering Disciplines and Building Science **Introduction to Civil Engineering:** Surveying, Structural Engineering, Geotechnical Engineering, Hydraulics & Water Resources, Transportation Engineering, Environmental Engineering, Construction planning & Project management. **Basic Materials of Construction**: Bricks, Cement & mortars, Plain, Reinforced & Pre-stressed Concrete, Structural steel, Construction Chemicals. **Structural Elements of a Building:** foundation, plinth, lintel, chejja, Masonry wall, column, beam, slab and staircase.	
Module-2: Societal and Global Impact of Infrastructure	**(8 hrs)**
Societal and Global Impact of Infrastructure **Infrastructure**: Introduction to sustainable development goals, Smart city concept, Clean city concept, Safe city concept **Environment**: Water Supply and Sanitary systems, Urban air pollution management, Solid waste management, Identification of Landfill sites, urban flood control **Built-Environment:** Energy efficient buildings, Recycling, Temperature and Sound control in buildings, Security systems, Smart buildings.	
Module-3: Analysis of Force Systems	**(8 hrs)**
Concept of idealization, system of forces, principles of superposition and transmissibility, Resolution and composition of forces, Law of Parallelogram of forces, Resultant of concurrent force system, moment of forces, couple, free body diagram, equations of equilibrium, Numerical Problems. **Support Reactions:** Types of loads, supports and beams, Numerical problems on support reactions in statically determinate beams.	

Module-4: Centroid	(8 hrs)
Centroid of rectangle, triangle, circle, semicircle and quadrant of a circle from first principles, Numerical problems on centroid of built-up sections.	
Module-5: Moment of Inertia	**(8 hrs)**
Method of determining the moment of inertia of rectangle, triangle, circle, semicircle and quadrant of a circle from first principles, Parallel axis theorem, Perpendicular axis theorem, Polar moment of inertia, Radius of gyration, Numerical problems on moment of inertia of built-up sections.	
Text Books:	
1.	"Engineering Mechanics: Part I – Statics" by F L Singer, Harper and Row,
2.	"Mechanics for Engineers, Statics and Dynamics" by Beer F P and Johnston E R, 12th Edition, McGraw Hill.
3.	"Elements of Civil Engineering and Mechanics" by S S Bhavikatti, New Age International Publishers.
4.	"Civil Engineering- Societal & Global Impact" by Dr. Shakuntala Acharya and Dr. Nikhil Bugalia, Published by AICTE.
Reference Books:	
3.	"Engineering Mechanics: Principles of Statics and Dynamics" by Hibbler R C, 14th Edition, Pearson Press.
4.	"Engineering Mechanics: Statics" by J L Meriam and L G Kraige, 9th Edition, John Wiley and Sons.

Course Outcome Statements: After the successful completion of the course, the student will be able to	
CO1	Explain the scope of fields of civil engineering, building materials, structural elements and also the impact of infrastructure on global environment.
CO2	Explain the basic concepts of concurrent and non–concurrent force systems to solve engineering problems.
CO3	Apply the principles of engineering mechanics to analyze concurrent and non–concurrent force systems.
CO4	Calculate centroid and compute moment of inertia of built-up sections.
CO5	Prepare a report on components of various civil engineering structures.

Course Articulation Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	-	-	-	1	1	-	-	-	-	1
CO2	2	-	-	-	-			-	-	-	-	1
CO3	2	2	-	1	-	-	-	-	-	-	-	1
CO4	2	2	-	1	-	-	-	-	-	-	-	1
CO5	2	-	-		-	-	-	-	2	2	-	1
Avg.	**2**	**2**	-	**1**	-	-	-	-	**2**	**2**	-	**1**

3 : High, 2 : Medium, 1 : Low

Suggested Activity Based Assessment (ABA) Methods

- Visit to nearby residential / commercial / industrial building construction sites.
- Visit to nearby building and construction materials stores.
- Visit to nearby water storage / water and wastewater treatment structures.