



## FACULTY OF ENGINEERING & TECHNOLOGY

### First Year Bachelor of Engineering

**Course Code:** 102001201

**Course Title:** BASIC CIVIL ENGINEERING

**Type of Course:** Engineering Science Course

**Course Objectives:** The course introduces major branches of civil engineering and their role in fulfilling basic human needs. It imparts knowledge about different types of buildings, principles of planning, building services and materials used in the construction. The course helps students to know about conventional and modern surveying instruments and tools. It outlines sustainable infrastructure and green building technology.

#### Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
Lecture	Tutorial	Practical		Internal		External		Total
				Theory	J/V/P*	Theory	J/V/P*	
3	0	2	4	40 / 14	20 / 7	60 / 21	30 / 10	150 / 52

\* J: Jury; V: Viva; P: Practical

#### Detailed Syllabus:

Sr.	Contents	Hours
1	Introduction to Civil Engineering: History of Civil Engineering, Various branches, Scope, Role of a Civil Engineer, Impact of infrastructural development on the economy of a country, Infrastructural projects of 21st century.	3
2	Building Construction: Functions of different components of a building, Various loads acting on a building, Types of structures (load bearing structure, framed structure and composite structure), Introduction to sustainable building construction.	8
3	Introduction to Building Planning, building services and estimation: Principles of planning and basic requirements, Plan elevation and section of a single room residential building, Typical building layout (residential and industrial), Symbols used in electrical layout, Symbols used in water supply, Plumbing and sanitation, Building bye-laws, Estimation of one room building. Necessity and principles of town planning.	10
4	Building Materials and Properties: Types, characteristics / properties and uses of different building materials –Stone, Aggregate, Sand, Brick, Cement, Mortar, Concrete (PCC and RCC), Timber, Steel, Plastic, Bitumen and Fly ash, Field tests of brick and cement. Sustainable building materials, Nano materials, Recycling and reuses of materials.	7



5	Introduction to Surveying and Levelling: Surveying – principles, types, linear measurements and horizontal angles by compass. Levelling: Determination of RLs by different methods, Contours and contour maps. Area and volume measurements by Simpson’s one third rule. Introduction to modern instruments and tools in surveying – ODM, EDM, Theodolite, Total Station, RS, GIS & GPS.	12
6	Sustainable Infrastructures: Green buildings, Energy efficient buildings, Green rating, Embodied energy, Life cycle analysis, Smart buildings and building automation, Smart Cities and its features, River interlinking, Development of riverfronts, earthquake resistant structures, Mass transportation systems- BRTS, Metro, Expressway etc.	5

### Suggested Specification table with Marks (Theory) (Revised Bloom’s Taxonomy):

Distribution of Theory Marks						R: Remembering; U: Understanding; A: Application, N: Analyze; E: Evaluate; C: Create
R	U	A	N	E	C	
30%	45%	25%	0	0	0	

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

### Reference Books:

1	Dr. B.C. Punmia, Ashok kumar Jain, Arunkumar Jain, “Surveying Vol. I”, Laxmi Publication New Delhi.
2	Duggal S.K. “Surveying Vol. I” Tata McGraw Hill Publication, New Delhi.
3	Dr. B.C. Punmia, Ashok kumar Jain, Arunkumar Jain “Building Construction” Laxmi Publication New Delhi.
4	S.C. Rangwala, “Engineering Material” Charotar Publication.
5	S. Ramamrutham “Basic Civil Engineering” Dhanpatrai Publication.
6	S.C. Rangwala, “Civil Engineering Drawing” Charotar Publication.
7	Gurucharan Singh / Jagdish Singh, “Building planning, designing and scheduling” Standard Publisher.
8	S.C. Rangwala, “Estimating and Costing ” Charotar Publishing house.



## Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	To understand history, role and branches of Civil Engineering.	5
CO-2	To understand Building components, loads on buildings and types of structures.	15
CO-3	To study planning of buildings, its services and basic estimation process.	20
CO-4	To understand different materials of Civil Engineering field.	15
CO-5	To study the basics of surveying and levelling.	25
CO-6	To study various aspects of sustainable infrastructures.	20

## List of Practicals / Tutorials:

1	Computation of area by planimeter
2	Study of different building components (site visit)
3	Typical section of a load bearing wall (drawing)
4	Prepare a plan, section and elevation of a single room building (2 turns)
5	Layout of industrial buildings
6	Study of symbols used in building services
7	Estimation of building
8	Horizontal angle measurement using compass
9	Determination of RLs by Dumpy level
10	Demo of Total Station, GPS etc
11	Introduction to modern surveying instruments
12	Presentations on sustainable infrastructures and Smart Cities.

**ANY TEN FROM THE LIST SHALL BE PERFORMED**

## Supplementary learning Material:

1	<a href="https://www.ecoideaz.com/expert-corner/green-buildings-in-india">https://www.ecoideaz.com/expert-corner/green-buildings-in-india</a>
2	<a href="https://www.thebetterindia.com/98627/green-buildings-india-architecture-sustainability/">https://www.thebetterindia.com/98627/green-buildings-india-architecture-sustainability/</a>
3	<a href="https://www.bautextsystems.com/blog/energy-efficient-buildings">https://www.bautextsystems.com/blog/energy-efficient-buildings</a>
4	<a href="https://greencleanguide.com/three-primary-rating-systems-for-green-buildings-in-india/">https://greencleanguide.com/three-primary-rating-systems-for-green-buildings-in-india/</a>
5	<a href="https://www.commonfloor.com/guide/what-parameters-are-considered-for-green-rating-a-building-27732.html">https://www.commonfloor.com/guide/what-parameters-are-considered-for-green-rating-a-building-27732.html</a>
6	<a href="https://www.pcmcindia.gov.in/green_building_about.php">https://www.pcmcindia.gov.in/green_building_about.php</a>
7	<a href="https://www.oneclicklca.com/10-essential-facts-about-building-life-cycle-assessment/">https://www.oneclicklca.com/10-essential-facts-about-building-life-cycle-assessment/</a>
8	<a href="http://mowr.gov.in/schemes-projects-programmes/schemes/interlinking-rivers">http://mowr.gov.in/schemes-projects-programmes/schemes/interlinking-rivers</a>
9	<a href="https://en.wikipedia.org/wiki/Indian_Rivers_Inter-link">https://en.wikipedia.org/wiki/Indian_Rivers_Inter-link</a>



10	<a href="https://www.indiawaterportal.org/articles/national-river-linking-project-dream-or-disaster">https://www.indiawaterportal.org/articles/national-river-linking-project-dream-or-disaster</a>
11	<a href="https://sandrp.in/2014/09/17/riverfront-development-in-india-cosmetic-make-up-on-deep-wounds/">https://sandrp.in/2014/09/17/riverfront-development-in-india-cosmetic-make-up-on-deep-wounds/</a>
12	<a href="http://mohua.gov.in/upload/uploadfiles/files/Chap-8.pdf">http://mohua.gov.in/upload/uploadfiles/files/Chap-8.pdf</a>
13	<a href="http://www.hms.civil.uminho.pt/sahc/2014/K3.pdf">http://www.hms.civil.uminho.pt/sahc/2014/K3.pdf</a>
14	<a href="https://en.wikipedia.org/wiki/Urban_rail_transit_in_India">https://en.wikipedia.org/wiki/Urban_rail_transit_in_India</a>
15	<a href="https://www.intelligenttransport.com/transport-articles/21458/city-public-transportation-india/">https://www.intelligenttransport.com/transport-articles/21458/city-public-transportation-india/</a>
16	<a href="https://www.technoarete.org/common_abstract/special_pdf/special_09458.pdf">https://www.technoarete.org/common_abstract/special_pdf/special_09458.pdf</a>
17	<a href="http://www.walkthroughindia.com/walkthroughs/the-10-amazing-expressways-in-india/">http://www.walkthroughindia.com/walkthroughs/the-10-amazing-expressways-in-india/</a>
18	Relevant videos to explain the contents of the syllabus

<b>Curriculum Revision:</b>	
Version:	<b>1</b>
Drafted on (Month-Year):	Apr-20
Last Reviewed on (Month-Year):	Jul-20
Next Review on (Month-Year):	Apr-22