SAMRAT ASHOK TECHNOLOGICAL INSTITUTE
(Engineering College), VIDISHA M.P.
(An Autonomous Institute Affiliated to RGPV Bhopal)
---------CIVIL ENGINEERING----------

Semester/Year	II/I	Program	B.Tech
Subject Category: DC	Subject Code: CE-301	Subject Name:	Building Materials & Construction

Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks				
End Sem	Mid-Sem	Assignment	Quiz	End Sem	Lab-Work	Quiz		L	T	P	
60	20	10	10	30	10	10	150	3	-	2	4

Prerequisites:

Basic knowledge to identify different types of material.

Course Objective:

Students are expected to learn concepts of physical properties of construction materials and their respective testing procedure & uses, components of Building Industry, principles and methods to be followed in constructing various components of a building.

Course Outcomes:

After completion of the course, the student will be able to:

1. To identify various building materials and select suitable type of building material for given situation and also the emerging materials in the field of Civil Engineering construction.
2. To select suitable type of foundation and various types of brick masonry, door and windows for buildings.
3. Classify different types flooring and arch geometry and building repair work.

UNITs	Descriptions	Hrs.	CO's
I	**Stones:** Occurrence, varieties, Characteristics and their testing, uses, quarrying and dressing of stones. Timber: Important timbers & their engineering properties and uses, defects in timber, seasoning and treatment, need for wood substitutes, Alternate materials for shuttering doors/windows, Partitions and structural members etc. Brick and Tiles: Manufacturing, characteristics, Classification and uses, Improved brick from inferior soils, Hand moulding brick table, Clay brick table, Flooring types of flooring and their characteristics.	9	CO1
II	**Advance Construction Materials:** Use of fly ash in mortars, concrete, Fly ash bricks, stabilized mud blocks, non-erodible mud plinth, D.P.C. materials, building materials made by Industrial & agricultural waste, clay products P.V.C. materials, advance materials for flooring, doors & windows, fascia material, interiors materials for plumbing, sanitation & electrification.	8	CO1
III	**Foundation:** Type of soils, bearing capacity, soil stabilization and improvement of bearing capacity, settlement and safe limits. Types of foundations, wall footings, grillage, foundations, well foundation, causes of failure and remedial measures; under reamed piles, foundation on shrinkable soils, black cotton soil, timbering for trenches, dewatering of foundations. Hyperbolic parboiled footing, Brick arch foundation. Simple methods of foundation design, Damp proof courses, Repairs Techniques for foundations.	7	CO2
IV	**Masonry and Walls:** Brick masonry, Bonds, Jointing, Stone masonry, casting and laying, masonry construction, Brick cavity walls, code provisions regarding load bearing and non-load bearing walls. Common defects in construction and their effect on strength and performance of walls, designed Brick masonry, precast stone masonry	8	CO2

	block, Hollow concrete block, plastering and pointing, white and colour washing, distempering, dampness and its protection, Design of hollow block masonry walls. Doors, Windows and Ventilators: Types, based on material etc., size location, fittings, construction of sunshades, sills and jambs, RCC doors/windows frames. Types of stair cases, rule of proportionality etc., Repairs techniques for masonry, walls, doors & windows.		
V	**Floors and Roofs:** Types, minimum thickness, construction, floor finishes, Flat roofs, RCC jack arch, reinforced brick concrete, solid slab and timber roofs, pitched roofs, false ceiling, roof coverings, Channel unit, cored unit, Waffle unit, Plank and Joist, Brick panel, L-Panel, Ferrocement roofing units, water proofing. Services: Water supply & Drainage, Electrification, Fire protection, thermal insulation, Air Conditioning, Acoustics & Sound insulation, Repairs to damaged & cracked buildings, techniques and materials for low-cost housing., Repairs techniques for floors & roofs.	8	CO3
Guest Lectures (if any)			
Total Hours		40	

Suggestive list of experiments:

1. Testing of Cement: Consistency of cement, initial and final setting time, Fineness, Specific Gravity and compressive strength of cement.
2. Testing of fine aggregate: Specific Gravity, sieve analysis and zoning, bulking of fine aggregate, bulk density, silt content.
3. Testing of coarse aggregate: Specific Gravity, sieve analysis, water absorption & moisture content.
4. Test on Bricks: Water Absorption and compressive strength of Brick.
5. Test on Tiles: Water Absorption and Flexural strength of Tiles.
6. Tension test on mild steel and HYSD bars.
7. Bending Test on Wood under two point loading.

Text Book-

1. Mohan Rai& M.P. Jai Singh; Advance in Building Materials & Construction,
2. S.C. Rangwala; Engineering Materials
3. Sushil Kumar; Building Construction,
4. B.C. Punmia; Building Construction,

Reference Books-

1. Building Construction, Metchell
2. Construction Technology, Chudley R.
3. Civil Engineering Materials, N. Jackson.
4. Engineering Materials, Surendra Singh.

Modes of Evaluation and Rubric

Quiz, Assignment, Midterm exam, End term exam and Practical Viva.
Rubric: End term exam. Practical: 50% Quiz and 50% Viva.

List/Links of e-learning resource

https://nptel.ac.in/courses/105/102/105102088/

https://nptel.ac.in/courses/105/106/105106206/

Recommendation by Board of studies on	13-06-2024
Approval by Academic council on	
Compiled and designed by	
Subject handled by department	Civil Engineering Department

SAMRAT ASHOK TECHNOLOGICAL INSTITUTE
(Engineering College), VIDISHA M.P.
(An Autonomous Institute Affiliated to RGPV Bhopal)
---------CIVIL ENGINEERING----------

Semester/Year	III/II	Program	B.Tech
Subject Category: DC	Subject Code: CE-302	Subject Name:	Strength of Materials

Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks				
End Sem	Mid-Sem	Assignment	Quiz	End Sem	Lab-Work	Quiz		L	T	P	
60	20	10	10	30	10	10	150	3	-	2	4

Prerequisites:

Physics and Mathematics.

Course Objective:

Students are expected to learn basic concepts of mechanical properties of materials, concept of stress, strain and deformation of solid and state of stress, strain energy, principal stress and principal planes, theory of torsion and stresses in springs, fundamental concepts of mechanics of deformable solids; including static equilibrium, geometry of deformation, and material constitutive behavior so that the students can solve real engineering problems and design engineering systems.

Course Outcomes:

After completion of the course, the student will be able to:

1. Develop an understanding of the engineering fundamentals of structural mechanics of deformable bodies.
2. Determine stress, strain, deflection and rotation in members subjected to combination of loadings.
3. Design simple bars, beams and circular shafts for allowable stresses and loads using appropriate material considering engineering properties.

UNITs	Descriptions	Hrs.	CO's
I	Simple Stress and Strains: Mechanical Properties of material, Concept of Elastic body, Stress and Strain, Hooke's law, various types of stress and strains, Elastic constants, Stresses in compound bars, composite and tapering bars, Temperature stresses and strain. Complex Stress and Strains: Two dimensional and three dimensional stress system. Normal and tangential stresses, Principal Planes, Principal Stresses and strains, Mohr's circle of stresses.	10	CO1, CO2
II	Shear Force, Bending Moment & Deflection of Beams: Shear Force and Bending moment Diagram in beams with various loads and couple, Simply Supported, Cantilever and Overhanging beams, Point of Contraflexure, Relationship between bending moment and shear force. SFD and BMD by Graphical Method. Theory of Bending: Concept of pure bending. Equation of bending, Neutral axis, Section-Modulus, Determination of bending stresses in simply supported, Cantilever and Overhanging beams subjected to various loads and couples, Shear Stress distribution across a section in beams of various cross sections, Built-up beams and Shear flow.	9	CO1, CO2, CO3
	Deflection of beams: Double Integration Method, Macaulay's Method, Deflection by Method of Superposition, Conjugate Beam method, Moment Area Method.	5	CO1, CO2
IV	Torsion of Shafts: Concept of pure torsion, Torsion equation, Determination of shear stress and angle of twist of shafts of circular section, Torsional Moment Diagram (TMD), Hollow shafts, ,	7	CO1, CO2, CO3

	Transmission of power by circular shafts, Open and closed coil springs, Leaf Spring, Spiral Spring Pressure Vessels: Thin and Thick-walled cylinders and spheres, Stress due to internal pressure, change in diameter and volume, Compound cylinders and shrink fittings, Theories of failure.		
V	Columns and Struts: Eccentric loading on columns, Euler's buckling load for uniform section, various end conditions, slenderness Ratio, Stress in columns, Secant formula. Unsymmetrical Bending and Curved beams: Bending of a beam in a plane which is not a plane of symmetry, Shear center, Pure bending of curved beams of rectangular, circular and trapezoidal sections, Stress distribution and position of neutral axis.	9	CO1, CO2
Guest Lectures (if any)			
Total Hours		40	

Suggestive list of experiments:

1. To find Modulus of Elasticity 'E' of Mild Steel and Wood by Deflection method.
2. To find Modulus of Rigidity 'N' of Mild Steel by Barton's vertical torsion apparatus.
3. To find Modulus of Rigidity 'N' of spring material by Spring test apparatus.
4. To verify Shear Force at a given section of a Simply Supported Beam.
5. To verify Bending Moment at a given section of a Simply Supported Beam.
6. To verify Maxwell's Theorem of Reciprocal Deflection.
7. To perform Tensile Test on M.S. and C.I. specimen and draw stress strain curve.
8. To perform Compression test on Teak and Jungle wood and R.C.C. C.I. cubes and compare their results.
9. To determine Ultimate Shear Strength of M.S., C.I. and Brass.
10. To determine Modulus of Rupture of Teak and Sal wood beam by Flexural Test

Text Book-

1. Mechanics of Materials, by R.C. Hibbeler, Pearson Publications.
2. Mechanics of Materials, by Barry J. Goodno& James M.Gere, Cengage Publications.
3. Strength of Materials (Schaum's), Nash William; McGraw Hill International

Reference Books-

1. Strength of Materials, Pytel and Singer, Harper International.
2. Mechanics of Materials, Beer and Johnston, McGraw Hill.
3. Strength of Materials, Subramanian R, Oxford Publications

Modes of Evaluation and Rubric

Quiz, Assignment, Midterm exam, End term exam and Practical Viva.
Rubric: End term exam. Practical: 50% Quiz and 50% Viva.

List/Links of e-learning resource

https://swayam.gov.in/nd1_noc20_ce50/preview

https://swayam.gov.in/nd1_noc20_ce34/preview

Recommendation by Board of studies on	13-06-2024
Approval by Academic council on	
Compiled and designed by	
Subject handled by department	Civil Engineering Department

SAMRAT ASHOK TECHNOLOGICAL INSTITUTE
(Engineering College), VIDISHA M.P.
(An Autonomous Institute Affiliated to RGPV Bhopal)
---------CIVIL ENGINEERING----------

Semester/Year		V/III	Program		B.Tech
Subject Category	DC	Subject Code:	CE-303	Subject Name:	Building Planning & Architecture

Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks				
End Sem	Mid-Sem	Assignment	Quiz	End Sem	Lab-Work	Quiz		L	T	P	
60	20	10	10	-	-	-	100	3	-	-	3

Prerequisites:

Engineering Graphics

Course Objective:

Students are expected to learn the principles of planning, bylaws of building construction; to draw plan, elevation and section of load bearing and framed buildings; to learn about to draw various building services facilities; to prepare detailed working drawing for joinery in buildings, stair cases and to learn to draw the perspective drawing.

Course Outcomes:

After completion of the course, the student will be able to:

1. Apply the principles of planning and bylaws used for building planning & its functional design.
2. Draw plan, elevation and section for various types of buildings - residential and public buildings.
3. Draw the various elements of buildings like staircase, joineries.
4. Draw perspective view of building and its elements.
5. Draw for various building services like water supply, drainage, electrification, fire safety and acoustics in the building.

UNITs	Descriptions	Hrs.	CO's
I	Drawing of Building Elements – Drawing of various elements of buildings like various types of footing, open foundation, raft, grillage, pile and well foundation, Drawing of frames of doors, window, various types of doors, window and ventilator, lintels and arches, stairs and staircase, trusses, flooring, roofs etc.	10	CO3
II	Building Planning – Provisions of National Building Code, Building bye-laws, open area, setbacks, FAR terminology, Principles of architectural composition (i.e., unity, contrast, etc.), principles of planning, orientation, energy efficient buildings.	8	CO1
III	Building Services – Introduction of Building Services like water supply and drainage, electrification, ventilation and lightening and staircases, fire safety, thermal insulation, acoustics of buildings	7	CO5
IV	Design and Drawing of Building – Functional design and preparation of detailed drawings of residential, institutional and commercial buildings, detailing of doors, windows, ventilators and staircases etc.	8	CO2
V	Perspective Drawing – Basic principles of perspective drawing, elements of perspective drawing involving simple problems, one point and two point perspectives.	7	CO4
Guest Lectures (if any)			
Total Hours		40	

Suggestive list of experiments:
1. Sketches of various building components. 2. One drawing sheet of various building components containing doors, windows ventilators, 3. One drawing sheet of lintels and arches. 4. One drawing sheet of various types of foundations. 5. One drawing sheet of staircases, 6. One drawing sheet for services and interiors of buildings. 7. One drawing sheet containing detailed planning of a single-story residential building (common to all students) 8. One drawing sheet of residential building (Each student will make a different drawing). 9. One drawing sheet of public building (Each student will make a different drawing). 10. One sheet on perspective drawing.
Text Book- 1. Chakraborty; Building Drawing 2. Shah, Kale & Patki; Building Design and Drawing; TMH
Reference Books- 1. Guru charan Singh &Jagdish Singh Building Planning, Design and Scheduling. 2. Malik &Meo; Building Design and Drawing
Modes of Evaluation and Rubric
Quiz, Assignment, Mid-term exam, End term exam and Practical Viva. Rubric: End term exam. Practical: 50% Quiz and 50% Viva.
List/Links of e-learning resource
https://nptel.ac.in/noc/courses/noc22/SEM1/noc22-ar06/ https://nptel.ac.in/courses/124/107/124107001/ https://nptel.ac.in/courses/105/107/105107156/

Recommendation by Board of studies on	13-06-2024
Approval by Academic council on	
Compiled and designed by	
Subject handled by department	Civil Engineering

SAMRAT ASHOK TECHNOLOGICAL INSTITUTE
(Engineering College), VIDISHA M.P.
(An Autonomous Institute Affiliated to RGPV Bhopal)
---------CIVIL ENGINEERING----------

Semester/Year	III/II	Program	B.Tech
Subject Category: DC	Subject Code: CE-304	Subject Name:	Surveying-I

Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks				
End Sem	Mid-Sem	Assignment	Quiz	End Sem	Lab-Work	Quiz		L	T	P	
60	20	10	10	30	10	10	150	3	-	2	4

Prerequisites:

Nil

Course Objective:

The students are expected to understand the importance of surveying in the field of civil engineering and to learn the basics of linear/angular measurement methods like chain surveying, compass surveying, plane table surveying in plan making, levelling and theodolite survey in elevation and angular measurements & tachometric survey for distance and height measurement

Course Outcomes:

After completion of the course, the student will be able to:

1. Identify the concept of surveying, leveling and contouring and carry out linear and angular measurements required by different methods of surveying
2. Carry out traversing, trigonometrically leveling and tachometry using appropriate instruments and perform calculations
3. Identify different types of curves and perform calculations for setting out
4. Explain the triangulation principle and its application in control survey
5. Demonstrate the knowledge of hydrographic surveying, photographic surveying and remote sensing.

UNITs	Descriptions	Hrs.	CO's
I	Introduction to Surveying- Principles, Linear, angular and graphical methods, Survey stations, Survey lines- ranging, Bearing of survey lines, Local attraction, Declination, Dip, Latitude and Departure. Levelling: Principles of levelling- Dumpy level booking and reducing levels, Methods- simple, differential, reciprocal levelling, profile levelling and cross sectioning. Digital and Auto Level, Errors in levelling, Trigonometric levelling: Indirect levelling, levelling on steep ground- methods. Contouring: Characteristics, methods, uses.	9	CO1
II	Traversing by theodolite, Field work checks, traverse computations, latitude and departures, adjustments, computations of co-ordinates, plotting & adjusting or traverse, Omitted measurements, Measurement EDM, Trigonometrical leveling. Tachometry: Tachometric systems and principles, stadia system, uses of anallatic lens, tangential system, sublense system, instrument constant, field work reduction, direct-reading tachometers, use of tachometry for traversing and contouring.	8	CO2
III	Curves: Classification and use; elements of circular curves, calculations, setting outcurves by offsets and by theodolites, compound curves, reverse curves, transition curves, cubic spiral and lemniscates, vertical curves, setting out.	7	CO3

IV	Control Surveys: Providing frame work of control points, triangulation principle, conaissance, selection and marking of stations, angle measurements and corrections, baseline measurement and corrections, computation of sides, precise traversing.	8	CO4
V	Hydrographic Surveying: Soundings, methods of observations, computations and plotting. Principles of photographic surveying: aerial photography, tilt and height distortions, Remote sensing, simple equipments, elements of image interpretation, image-processing systems.	8	CO5
Guest Lectures (if any)			
Total Hours		40	

Suggestive list of experiments:

1. Chain Surveying
2. Plane table Surveying
3. Compass surveying
4. Leveling by auto level
5. Measurement of Angle by theodolite
6. Plotting a closed Traverse in field by using Theodolite.
7. Plotting an open Traverse in field by sing Theodolite
8. Determination of constants of Tachometers
9. Measurement of Horizontal Distance by stadia Tachometer
10. Measurement of Height and distances by Tangential Tachometry.
11. To Settling and simple curve by linear methods.

Text Book-

1. T.P. Kanetkar, Surveying & Leveling, Vol. I & II.
2. Duggal; Surveying vol I and II; TMH
3. Basak; Surveying and Leveling; TMH
4. R.E.Devis, Surveying theory & Practice, Mc.Graw Hill, New York

Reference Books-

1. David Clark & J Clendinning, Plane & Geodetic surveying Vol. I & II, constable & Co, London.
2. S.K. Roy, Fundamentals of surveying, prentice - Hall of India New Delhi
3. B.C. Punmia, Surveying Vol. I, II, III, Laxmi Publications New Delhi
4. K.R. Arora, Surveying Vol. I & II, standard book House, New Delhi

Modes of Evaluation and Rubric

Quiz, Assignment, Midterm exam, End term exam and Practical Viva.
Rubric: End term exam. Practical: 50% Quiz and 50% Viva.

List/Links of e-learning resource

https://swayam.gov.in/nd1_noc20_ce51/preview

Recommendation by Board of studies on	13-06-2024
Approval by Academic council on	
Compiled and designed by	
Subject handled by department	Civil Engineering Department

SAMRAT ASHOK TECHNOLOGICAL INSTITUTE
(Engineering College), VIDISHA M.P.
(An Autonomous Institute Affiliated to RGPV Bhopal)
---------CIVIL ENGINEERING----------

Semester/Year		IV/II	Program		B.Tech
Subject Category	DLC-I	Subject Code:	CE-305	Subject Name:	Computer Aided Drafting (CAD)

Maximum Marks Allotted							Contact Hours			Total Credits
Theory			Practical			Total Marks				
End Sem	Mid-Sem	Quiz	End Sem	Lab-Work	Quiz		L	T	P	
-	-	-	30	10	10	50	-	-	4	2

Suggestive list of experiments:

1. Sketches of various building components.
2. One drawing sheet of various building components containing doors, windows ventilators,
3. One drawing sheet of lintels and arches.
4. One drawing sheet of various types of foundations.
5. One drawing sheet of staircases,
6. One drawing sheet for services and interiors of buildings.
7. One drawing sheet containing detailed planning of a single-story residential building (common to all students)
8. One drawing sheet of residential building (Each student will make a different drawing).
9. One drawing sheet of public building (Each student will make a different drawing).
10. One sheet on perspective drawing.

Text Book-

1. Chakraborty; Building Drawing
2. Shah, Kale & Patki; Building Design and Drawing; TMH

Reference Books-

1. Guru charan Singh &Jagdish Singh Building Planning, Design and Scheduling.
2. Malik &Meo; Building Design and Drawing

Modes of Evaluation and Rubric

Lab work and Practical Viva.
Rubric: Practical: 50% Quiz and 50% Viva.

List/Links of e-learning resource

Recommendation by Board of studies on	13.6.2024
Approval by Academic council on	
Compiled and designed by	
Subject handled by department	Civil Engineering