

Bharati Vidyapeeth (Deemed To Be University), Pune
Faculty of Engineering and Technology
Programme: B. Tech. (Civil) –CBCS 2021 Course

Program: B. Tech. Civil

Sem: I

CBCS2021 Course

Sr. No.	Course Code	Name of Course	Teaching Scheme (Hrs./Week)			Examination Scheme (Marks)						Credits			
			L	P	T	UE	IA	TW	TW & OR	TW & PR	Total	L	P	T	Total
													TW/OR/PR		
1.		Differential Calculus	4	-	1	60	40	-	-	-	100	4	-	1	5
2.		Acoustics and Modern Physics	3	2	-	60	40	25	-	-	125	3	1	-	4
3.		Construction and Materials	4	2	-	60	40	-	50	-	150	4	1	-	5
4.		Civil Engineering Structures and Geology	4	2	-	60	40	-	-	50	150	4	1	--	5
5.		Introduction and Opportunities in Civil Engineering	3	-	-	60	40	-	-	-	100	3	-	--	3
6.		Graphics for Civil Engineers	-	2	-	--	--	-	50	-	50	-	1	--	1
7.		Workshop Technology	-	2	-	--	--	50	-	-	50	-	1	--	1
8.		Fundamentals of Problem Solving Logic (Using C)	-	2	-	--	--	25	-	-	25	-	1	--	1
		Total	18	12	1	300	200	100	100	50	750	18	6	1	25

Bharati Vidyapeeth (Deemed To Be University), Pune
Faculty of Engineering and Technology
Programme: B. Tech. (Civil) –CBCS 2021 Course

Program: B. Tech. Civil

Sem: II

CBCS2021 Course

Sr. No.	Course Code	Name of Course	Teaching Scheme (Hrs./Week)			Examination Scheme (Marks)						Credits			
			L	P	T	UE	IA	TW	TW & OR	TW & PR	Total	L	P	T	Total
													TW/OR/PR		
1.		Integral Calculus	4	-	1	60	40	-	-	-	100	4	-	1	5
2.		Applied Chemistry	3	2	-	60	40	25	-	-	125	3	1	-	4
3.		Statics and Dynamics	4	2	-	60	40	25	-	-	125	4	1	-	5
4.		Basic Land Surveying	4	2	-	60	40	-	-	75	175	4	1	-	5
5.		Construction Design & Drawing*	3	2	-	60	40	-	50	-	150	3	1	-	4
6.		Civil Engineering Software – I (AutoCAD)	-	2	-	-	-	-	-	50	50	-	1	-	1
7.		Object Oriented Programming (Using C++)	-	2	-	-	-	25	-	-	25	-	1	-	1
Total			18	12	1	300	200	75	50	125	750	18	6	1	25

*Theory paper of 4 hours duration

Programme: B. Tech. (Civil) Sem – I (2021)

Course: Differential Calculus		
<u>TEACHING SCHEME:</u>	<u>EXAMINATION SCHEME:</u>	<u>CREDITS ALLOTTED:</u>
Theory: 4 Hours / Week	End Semester Examination: 60 Marks Internal Assessment: 40 Marks	Theory: -04
Tutorial: 1 Hour / Week		Tutorial: - 01
Course Pre-requisites: The students should have knowledge of		
1	Algebra of matrices and its Determinants, Maxima and Minima of single variable functions.	
Course Objectives:		
To study	<ol style="list-style-type: none"> 1. Fundamental theorems, concepts in Matrices, Demoivr's theorem and its applications in engineering. 2. Various techniques in Calculus, Explanation of functions and Infinite series. 3. Partial differentiation, maxima, minima and its applications in engineering. 	
Course Outcomes: The student will be able to		
1	Understand rank of matrix and apply it to solve system of linear equations	
2	Understand the DeMoiver's theorem, hyperbolic functions and apply it in engineering problems.	
3	Understand the Leibnitz's rule and apply it to find nth derivative of a function.	
4	Understand fundamental concepts of convergence, divergence of infinite series and its tests.	
5	Understand the concept of partial differentiation and apply it to find total derivative.	
6	Evaluate the maxima and minima of any two variables functions.	
Course Content:		
UNIT - I	Matrices: Rank, Normal form, System of Linear Equations, Linear Dependence and Independence, Linear and Orthogonal Transformations. Eigen values, Eigen Vectors.	(08 Hrs)
UNIT - II	Complex Numbers and Applications: Definition, Cartesian, Polar and Exponential Forms, Argand's Diagram, De'Moivre's theorem and its application to find roots of algebraic equations., Hyperbolic Functions, Logarithm of Complex Numbers, Separation into Real and Imaginary parts, Application to problems in Engineering.	(08 Hrs)
UNIT - III	Differential Calculus: Differential Calculus: Successive Differentiation, nth Derivatives of Standard Functions, Leibnitz's Theorem. Expansion of Functions: Taylor's Series and Maclaurin's Series.	(08 Hrs)
UNIT - IV	Differential Calculus: Indeterminate Forms, L' Hospital's Rule, Evaluation of Limits. Infinite Series: Infinite Sequences, Infinite Series, Alternating Series, Tests for Convergence, Absolute and Conditional Convergence, Power series, Range of Convergence.	(08 Hrs)

UNIT - V	Partial Differentiation and Applications: Partial Derivatives, Euler's Theorem on Homogeneous Functions, Implicit functions, Total Derivatives, Change of Independent Variables	(08 Hrs)
UNIT - VI	Jacobian: Jacobians and their applications, Chain Rule, Functional Dependence. Maxima and Minima: Maxima and Minima of Functions of two variables, Lagrange's method of undetermined multipliers.	(08 Hrs)
Internal Assessment		
	Unit Test: I and II	
Textbooks:		
1. Applied Mathematics (Volumes I and II) by P. N. Wartikar & J. N. Wartikar, (Pune Vidyarthi Griha Prakashan, Pune), 7 th Edition, 1988, Reprint 2010.		
2. Higher Engineering Mathematics by B. S. Grewal (Khanna Publication, Delhi), 42 th Edition, 2012.		
Reference Books:		
1. Higher Engineering Mathematics by B.V. Ramana (Tata McGraw-Hill), Edition ,2008.		
2. Advanced Engineering Mathematics by Erwin Kreyszig (Wiley Eastern Ltd.), 8 th Edition, 1999, Reprint 2010.		
3. Advanced Engineering Mathematics, 7e, by Peter V. O'Neil (Thomson Learning), Edition 2007		
4. Advanced Engineering Mathematics, 2e, by M. D. Greenberg (Pearson Education), 2 nd , Edition, 2002.		
Project Based learning topics for Differential Calculus:		
Students are expected prepare report on any one topic, write its definition, applications and illustrate with few examples. Also, write pseudo code/proof for it, wherever applicable.		
1. Echelon form		
2. Normal form		
3. Linear and orthogonal transformation		
4. Eigen values and eigen vectors		
5. Argand diagram		
6. De Moivre's theorem		
7. Hyperbolic and logarithmic functions		
8. Leibnitz theorem		
9. Taylor's theorem		
10. L'Hospital rule		
11. Tests for convergence		
12. Euler theorem for homogeneous functions		
13. Total derivative		
14. Maxima and minima for two variable function		
15. Lagrange undetermined multipliers		

Programme: B. Tech. (Civil) Sem – I (2021)

Course: Acoustics and Modern Physics		
<u>TEACHING SCHEME:</u>	<u>EXAMINATION SCHEME:</u>	<u>CREDITS ALLOTTED:</u>
Theory: 3Hours / Week	End Semester Examination: 60 Marks Internal Assessment: 40 Marks	Theory: 3
Practical: 2 Hours / Week	Term Work: 25Marks	Term Work :1
		Total: 4
Course Pre-requisites: The students should have knowledge of		
1	Basic understanding of physics and calculus.	
Course Objectives:		
	To impart knowledge of basic concepts in physics relevant to engineering applications in a broader sense with a view to lay foundation for the Civil Engineering.	
Course Outcomes: The student will be able to		
1	Summarise the terms damping constant, characteristic frequency, kinetic and potential energy of a spring.	
2	Relate the problems associated with architectural acoustics and give their remedies.	
3	Connect the problems associated with defects and use ultrasonic as a tool in industry for non-destructive testing.	
4	Summarise and solve the engineering problems on Electromagnetism.	
5	Correlate the principles of different types of polarization and structural phase transitions phenomena in ferroelectric systems.	
6	Infer the wave nature of light and apply it to measure stress, pressure and dimension etc.	
Course Content:		
UNIT - I	Waves and oscillation Periodic motion, simple harmonic motion, characteristics of simple harmonic motion, vibration of simple springs mass system (Different combinations), Resonance - definition, damped harmonic oscillator – heavy, critical and light damping, energy decay in a damped harmonic oscillator, quality factor, forced mechanical and electrical oscillators.	(06 Hours)
UNIT - II	Architectural Acoustics Elementary acoustics, Limits of audibility, Audibility curve, Noise and musical sound, timbre, Reverberation and reverberation time, Sabine’s formula (without Derivation), Intensity level, Sound intensity level, Loudness, Sound absorption, Sound absorption coefficient, different types of noise and their remedies, Sound absorption materials, basic requirement for acoustically good hall, factors affecting the architectural acoustics and their remedies.	(06 Hours)
UNIT - III	Ultrasonic & NDT Introduction to ultrasonic, Production of ultrasonic by magnetostriction and	(06 Hours)

	piezoelectric methods Classification of Non-destructive testing methods, Principles of physics in Non-destructive Testing, Advantages of Non-destructive testing methods, Acoustic Emission Testing, Ultrasonic (thickness measurement, flaw detection), Radiography testing.	
UNIT - IV	Electromagnetic Wave Displacement current, Maxwell's equations (derivation), Wave equation for electromagnetic waves, Propagation in free space, Poynting theorem, Characteristic of Transverse electric and magnetic waves, Skin depth, Rectangular and circular waveguides.	(06 Hours)
UNIT - V	Engineering Materials and Applications Paramagnetic materials, diamagnetic materials, ferromagnetic materials, Dielectrics and electric polarisation. Liquid crystals: Noematic, Semitic and cholesteric phases, Liquid crystal display. Multiferroics: Type I & Type II multiferroics and applications, Magneto resistive Oxides: Magnetoresistance.	(06 Hours)
UNIT - VI	Wave optics Interference Interference of waves, interference due to thin film (Uniform and nonuniform), Applications of interference (optical flatness, interference filter, non-reflecting coatings). Diffraction Introduction, Classes of diffraction, Diffraction at a single slit (Geometrical method), Conditions for maximum and minimum, Plane diffraction grating, Conditions for principal maxima and minima Polarisation Introduction, Double refraction and Huygens's theory, Positive and negative crystals, Nicol prism, Dichroism.	(06 Hours)
Internal Assessment:		
Part- A	UNIT TEST – I and II	
Part- B	Assignments: Six assignments to be given by the subject teacher (Theory)- one from each unit/one mini project with report-students can work in group of 4 Maximum	
Term Work:		
	The term-work shall consist of any eight of the following.	
	1. Oscillation of a Spring - Mass System and a Torsional Pendulum	
	2. To study normal modes of oscillation of two coupled pendulums and to measure the normal mode frequencies.	
	3. To study normal modes of transverse vibration of a stretched string	
	4. Study of resonance in LCR circuit	
	5. To determine the velocity of sound	
	6. Measurement of average SPL across spherical wave front and behavior with the distance	

	7. Expansion chamber muffler: investigation of muffler response as a filter in the low frequency approximation by determining insertion loss.	
	8. Interference of sound using PC speakers	
	9. Determination of velocity of sound in liquid by ultrasonic interferometer	
	10. Ultrasonic probe - a study	
	11. Plotting the hysteresis loop for given magnetic material	
	12. Determination of radius of planoconvex lens/wavelength of light/Flatness testing by Newton's rings	
	13. Determination of wavelength of light using diffraction grating	
	14. Determination of resolving power of telescope	
	15. Determination of thickness of a thin wire by air wedge	
	16. Determination of refractive index for O-ray and E-ray	

Textbooks:

1. A Textbook of Engineering Physics, M N Avadhanulu, P G Kshirsagar and TVS Arun Murthy, S. Chand Publishing (2018)
2. Engineering Physics, R K Gaur and S L Gupta, Dhanpat Rai Publishing Co Pvt Ltd (2015)
3. Concepts of Modern Physics, Arthur Beiser, Shobhit Mahajan and S. Rai Choudhury, McGraw Hill Education (2017)

Reference Books:

1. Fundamentals of Physics, Jearl Walker, David Halliday and Robert Resnick, John Wiley and Sons (2013)
2. Optics, Francis Jenkins and Harvey White, Tata Mcgraw Hill (2017)
3. Principles of Physics, John W. Jewett, Cengage publishing (2013)
4. Introduction to Solid State Physics, C. Kittel, Wiley and Sons (2004)
5. Principles of Solid-State Physics, H. V. Keer, New Age International (1993)
6. Laser and Non-Linear Optics, B. B. Laud, New Age International Private Limited (2011)
7. Nanotechnology: Principles and Practices, Dr. S. K. Kulkarni, Capital Publishing Company (2014)
8. Science of Engineering Materials- C.M. Srivastava and C. Srinivasan, New Age International Pvt. Ltd. (1997)
9. Introduction to Electrodynamics –David R. Griffiths, Pearson (2013)
10. Renewable Energy: Power for a Sustainable Future, Boyle, Oxford University Press (2012)
11. Fundamentals of Physics, Jearl Walker, David Halliday and Robert Resnick, John Wiley and Sons (2013)

Topics for project-based Learning for Acoustics and Modern Physics

1. Measurement and effect of environmental noise in the college
2. Design and simulation of automatic solar powered time regulated water pumping
3. Solar technology: an alternative source of energy for national development

4. Double pendulum and its application
5. Comparison of various method used in measuring the gravitational constant g
6. The physics of stars and their astronomical identification
7. Design and construction of digital distance measuring instrument
8. Electronic eye (Laser Security) as autoswitch/security system
9. Electric power generation by road power
10. Measurement /simulation of reverberation time
11. Study of vibration of bars
12. Determination of absorption coefficient of sound absorbing materials
13. Determination of velocity of O-ray and E-ray in different double refracting materials
14. Need of medium for propagation of sound wave
15. Small wind turbines as a source of electricity

Programme: B. Tech. (Civil) Sem – I (2021)

Course: Construction and Materials		
<u>TEACHING SCHEME:</u>	<u>EXAMINATION SCHEME:</u>	<u>CREDITS ALLOTTED:</u>
Theory: 4Hours / Week	End Semester Examination: 60 Marks Internal Assessment: 40 Marks	Theory: 4
Practical: 2 Hours / Week	Term Work & OR: 50 Marks	Term Work & OR: 1
		Total:5
Course Pre-requisites: The students should have knowledge of		
1	Basic concepts of Engineering Drawing	
Course Objectives:		
	To develop the knowledge of building components, materials and construction practices	
Course Outcomes: The student will be able to		
1	Elaborate the types of structures and components of building	
2	Explain building foundation, types of masonry	
3	Identify the types of doors, windows and design various staircases	
4	Select and apply the proper type of floors and types of roofs	
5	Illustrate the types of plasters, pointing and paints	
6	Apply the proper formwork and scaffolding, use proper construction safety	
Course Content:		
UNIT - I	Civil Engineering materials and Building Components Civil Engineering scope, Types of Building as per National Building Code and role of Civil engineer; Types of structures based on loading, material and configuration (all types of construction materials); Building components and their functions	(08 Hours)
UNIT - II	Building Foundation, Masonry and Material Foundation: Types – Shallow foundation and Deep foundation, Suitability of foundations, failure of foundation and its causes. Stones and Stone Masonry: Requirement of good building stones, Stone masonry-principal terms, types (Random Rubble, Uncoursed Rubble, Coursed Rubble and Ashlar Masonry) Brickwork and Brick masonry: Characteristics of Bricks, IS Specification of Bricks, Classifications of bricks (Silica, refractory, fire and Fly ash bricks), Types of bonds: English, Flemish, Header, Stretcher.	(08 Hours)
UNIT - III	Doors, Windows and Staircase Doors: Definition and terminology, Installation of doors frames, Types of Doors: Glazed or sash door, flush door, louvered door, collapsible doors, revolving doors, sliding doors, swing doors. Windows: Definition and terminology, Types of window: Casement window, Sliding Window, Louvered or venetian window, gable window, skylight window, Ventilators. Stairs: Classification, Terminology used, Types: Straight staircase, Open well stair, quarter turn stairs, half turn stairs, turning staircase, dog legged	(08 Hours)

	staircase, circular stairs, Bifurcated stairs and spiral stairs, Details of Ramps, Lifts and Escalators. Lintels: Types, Details of R.C.C. lintels and chajja.	
UNIT - IV	Floors and Roofs Flooring: I.S. Specifications, Types of floor finishes and suitability, Construction details of (mud, concrete, brick and stone flooring), Factors for selection of flooring, types of flooring: Timber flooring, tiled flooring, ceramic flooring, mosaic flooring, Industrial flooring: tremix or Vacuum Dewatered Flooring (VDF) Roofs: Types, Suitability, Roof structures, Selection of roof covering material, Methods of water proofing of roofs, Types of trusses, Fixtures & fastenings.	(08 Hours)
UNIT - V	Building Finishes Plastering: Methods, tools used, Mortars, Defects, Plaster types: Lime plaster, cement plaster, gypsum plaster, Plaster of Paris and applications Pointing: Purpose and Types of pointing, Methods of pointing. Paints: Types and applications, Textures, Apex, Plastic emulsion Wall cladding: Materials, method of fixing, wall papering and glazing work.	(08 Hours)
UNIT - VI	Formwork, Scaffolding and Safety in construction Formwork: Necessity, Materials, Factors for selection, Types Scaffolding: Necessity, Materials, Factors for selection Safety in Construction: safety on site, storage of materials, construction safety, prevention of accidents, fire proof construction, repairs and maintenance.	(08 Hours)
Internal Assessment:		
Part- A	UNIT TEST- I :- UNIT – I, II, III	
	UNIT TEST II :- UNIT- IV,V,VI	
Part- B	Assignments: Students should perform theoretical / experimental assignment/s from the list below	
	1) Types of structures and building components	
	2) Building foundations, Stone and Brick Masonry	
	3) Design of staircase.	
	4) Floors and roofs	
	5) Building finishes	
	6) Formwork, scaffolding and Safety in construction	
Term Work:		
Part- A	The term-work shall consist of minimum Five drawing sheets from list below.	
	1) Lettering, Symbols, Types of line and dimensioning	
	2) Foundation: Isolated, Combined footings, Under Reamed Piles, Rafts	
	3) Type of stone masonry: Elevation and Sectional Drawing	
	4) Types of Brick Masonry:	
	5) Types of Doors and windows:	
	6) Types of stairs: plan and sectional drawing	
	7) Trusses: Various types of Trusses	

	8) Site Visit: To understand Various building Material and their use.	
Text Books:		
1.	“Building Construction”-Rangwala,Charotar Publication	
2.	“The Text Book of Building Construction”-S.P.Arora&S.P.Bindra-DhanpatRai Publication	
3.	“Building Technology and Valuation”- TTTI Madras, -- Tata McGraw Hill Publication	
4.	“Building Construction” by B.C.Punmia, Laxmi Publications.	
Reference Books:		
1.	“My Construction Practices” R.B.Chaphalkar	
2.	“A to Z” Building Construction” Mantri Publications	
3.	“Materials of Construction” – Ghose- Tata McGraw Hill Publications	
4.	“Civil engineering Material’- TTTI Chandigarh- Tata McGraw Hill Publications	
5.	‘Building Material Technology by Ruth T. Brantly& L Reed Brantley, Tata McGraw Hill	
6.	Building Materials by S.K.Duggal, New Age International Publishers.	
e-Resources		
1.	https://nptel.ac.in/course.html	
2.	https://theconstructor.org/write-for-us/	
3.	https://www.engineerwing.com/2012/10/tremix-flooring.html	
4.	http://home.iitk.ac.in/~mohite/composite_introduction.pdf	
Topics for Project based learning:		
1:	Model making on various components of buildings, report writing, cost analysis and site visit.	
2.	Market survey, sample collections and report writing on all types of construction materials.	
3.	Report on Scope of Civil Engineering in various fields.	
4.	Collecting various National Building codes and report writing.	
5.	Model making on Types of Shallow foundations report writing	
6.	Model making on Types of Deep foundations report writing	
7.	Sample collections of various types of stones used in stone masonry report writing	
8.	Model making on Different types of stone masonry (mentioned in syllabus) report writing	
9.	Model making on various types of Brick bond masonry. (Mentioned in syllabus) report writing	
10.	Model making on different types of Doors report writing	
11.	Model making on different types of windows reports writing	
12.	Model making on different types of staircase report writing	
13.	Market survey, sample collections and report writing on various roofing materials.	
14.	The rain roof water-harvesting systems.	
15.	Site visit, market survey, report writing and cost analysis of various plastering materials.	
16.	Site visit, market survey, report writing and cost analysis of various types of Paint.	
17.	Model making on Types of formwork and designs.	
18.	Model making on various types of Scaffolding and designs.	
19.	Corrosion mechanism, prevention, and repairs measures of RCC structure.	
20	Construction Project Management & Building Information Modelling	

Syllabus

Programme: B.Tech Civil Sem - I (2021)

Course: Civil Engineering Structures and Geology		
<u>TEACHING SCHEME:</u>	<u>EXAMINATION SCHEME:</u>	<u>CREDITS ALLOTTED:</u>
Theory: 4 Hours / Week	End Semester Examination: 60 Marks Internal Assessment: 40 Marks	TH:- 4
Practical: 2 Hours / Week	TW and PR :- 50 Marks	TW and PR: 1
		Total: 5
Course Pre-requisites: The students should have knowledge of		
1	Basic engineering sciences.	
Course Objectives:		
	To make the student know the variety of Civil Engineering Structures and the importance of Geology for Civil Engineers.	
Course Outcomes: The student will be able to		
1	Identify and know various civil engineering structures based on their function.	
2	Identify and know various civil engineering structures based on their behaviour.	
3	Identify and know various civil engineering structures based on their performance	
4	Students should be able to identify different rocks & minerals.	
5	Students should be able to identify different Geological structures to decide location and type of civil engineering structure.	
6	Students should be able to carry out preliminary geological investigation for Tunnel, Dam & Bridge.	
Course Content:		
UNIT - I	Structures Based on their Function: Types of structures, various functions served by Civil Engineering structures, Structures used for residential purpose, structures used for water storage and retaining, structures used for industries, structures used for transportation, structures used for treatment of water and wastewater, structures used for storage of liquids, special structures like nuclear reactors, towers, chimneys etc..	(08 Hours)
UNIT - II	Structures based on their behaviour: Various behaviours of a structure, Load bearing Structures, Framed Structures, light structures, medium structures, heavy structures, solid structures, tubular structures, cavity walls, shear walls, tall structures, flat slabs, precast and pre-stressed structures.	(08 Hours)
UNIT - III	Structures based on their performance: Various performances of a structure-strength, serviceability, Energy conservation, soil conservation from a structure, water conservation from a structure.	(08 Hours)

	Concept of ECO building, green buildings, Intelligent building, Low-Cost Housing, High rise buildings.	
UNIT - IV	Importance of Geology in Civil Engineering structures. Importance of Geology in Civil Engineering structures Mineralogy and Petrology: Mineralogy: Formation Process of Minerals, types of minerals, classification of minerals. Petrology: Igneous rocks-mineral composition, texture, classification of igneous rock. Secondary rocks- Weathering, texture & structure of sedimentary rocks & its classification. Metamorphic Rocks-Agents & types of metamorphism, building stones.	(08 Hours)
UNIT - V	Structural Geology & Indian Geology: Structural Geology- Outcrop, dip & strike, conformable series, unconformity & overlap, faults & folds in rocks, mode of occurrence of igneous rocks, joints & fractures. Indian Geology- General Principles of stratigraphy, age of the earth & divisions of geological time, physiographic divisions of India & their characteristics, geological history of peninsula, study of formations in peninsula.	(08 Hours)
UNIT - VI	Geological Investigations: Preliminary geological investigations surface survey, use of geological maps & sections, subsurface investigation. drill holes, test pits, trenches, exploratory tunnels, shafts, adits, drifts etc. Limitation of drilling, engineering significance of geological structures.	(08 Hours)
Internal Assessment:		
Part- A	UNIT TEST – I and II	
Part- B	Assignments: Students should perform theoretical / experimental assignment/s from the list below	
	1) Types of structures and their functions.	
	2) Structures based on behavior	
	3) Structures based on performance	
	4) Types of minerals & Their physical properties	
	5) Types of different geological structures	
	6) Preliminary geological investigation.	
Term Work:		
	a) Review project on any one type of structures	
	b) Identification of the Minerals (2 Practical)	
	c) Identification of Igneous rocks (1 Practical)	
	d) Identification of Secondary rocks (1 Practical)	
	e) Identification of Metamorphic rocks (1 Practical)	
	f) Study of Contoured Geological Maps & drawing the sections (Six Practical)	
	g) Visit to site for understanding the geological features.	
Textbooks:		
	1. S.P. Bindra S.P. Arora, “Building Construction”, Laxmi Publication	

2. M. L. Shah, C. M. Kale, S. Y. Patki, "Building Drawing with integrated approach to Built Environment", Tata McGraw Hill Publishers
3. Gupte R.B, "A text book of engineering geology",P.V.G. Publications,Pune.
Reference Books:
1. IS provisions "National Building Code"
2. "Development Control Rules" of local plan sanctioning authority
3. Calendar, "Time Saver Standards for Architectural Design", Tata McGraw Hill Publishers
4. Merit, "Building Design and Construction", Tata McGraw Hill Publishers
5. Engineering Geology & General Geology By Parbin singh
6. General Geology & Engineering Geology by Dr.P.T.Sawant, New Delhi Publication.
Topics for project-based Learning for Civil Engineering Structures and Geology
1. Prepare a chart for structures used for Water treatment and sewage treatment plant.
2. Collect the information of various types of structures.
3. Prepare a model or chart for a retaining wall or any hydraulic structures.
4. Prepare a chart for comparison of load bearing and framed structure.
5. Prepare a prototype model for load bearing structure with showing all components.
6. Prepare a chart for various types of soil and water conservation structures.
7. Prepare a model of Bridge structure.
8. Collect the information of high rise building in India and prepare the report.
9. Prepare a chart or prototype model for Eco friendly and Intelligent building.
10. Effect of solid waste on quality of ground water.
11. Geophysical investigation using seismic refraction method to determine causes of real failure.
12. Resistivity methods used in horizontal and vertical discontinuities in the electrical properties of the Ground water.
13. Structural interpretation and mineral potential using remote sensing data and GIS tools.
14. Application of electrical resistivity method in ground water exploration.
15. Types of minerals.
16. Types of igneous rocks.
17. Types of metamorphic rocks.
18. Types of secondary rocks.
19. Texture of rocks.
20. Folds in rocks.
21. Failure in rocks.
22. Structures in rocks.
23. Determination of rock parameters, specific gravity, density and compressive strength of different types of rocks.

Syllabus
Programme: B. Tech. (Civil) – Sem – I CBCS 2021 Course

Course: Introduction and Opportunities in Civil Engineering		
<u>TEACHING SCHEME:</u>	<u>EXAMINATION SCHEME:</u>	<u>CREDITS ALLOTTED: 3</u>
Theory: 3Hours / Week	End Semester Examination: 60 Marks Internal Assessment: 40 Marks	Theory:3
Course Pre-requisites: The students should have knowledge of		
1	Basic Science	
Course Objectives:		
	To develop the knowledge of Basics of Civil Engineering and Building construction.	
Course Outcomes: The student will be able to		
1	Explain the introduction to civil engineering and various discipline.	
2	Elaborate Scope and role of civil engineering in all sectors.	
3	Identify the Civil Engineering project and process.	
4	Select the approvals required for Civil Engineering Construction Projects.	
5	Illustrate the Recent Developments in Civil Engineering	
6	Apply the Opportunities in Civil Engineering	
Course Content:		
UNIT - I	Introduction to Civil Engineering: Introduction to History of Civil Engineering, Definition of Civil Engineering, Various branches of civil Engineering and its application : Structural engineering , Construction engineering , Surveying and mapping engineering, Transportation engineering r, Environmental engineering, Hydraulic and irrigation engineering, Geotechnical engineering, Estimation and coasting ,Project management, Link of Civil Engineering with various discipline of Engineering : Mechanical Engineering, Electrical Engineering, Chemical Engineering, Electronic and Entc, Computer Engineering.	(06 Hours)
UNIT - II	Scope and role of Civil engineering: Impact of infrastructural development on the economy of a country, Role of civil engineers, Importance of planning, Scope of Civil engineering in government sector, Scope of civil engineering in private sector, Role of civil engineering in society	(06 Hours)
UNIT - III	Civil Engineering Project and Process: Need of project, Estimation cost and benefits of project, Cost-benefit ratio, Conceptual approval, technical planning and project proposal, Administrative approval, Detailed project report, Detailed Estimate of cost, Approvals and NOCs, Tendering and contracts, Terms and conditions, Work allotment, Inspection and quality control, Completion, maintenance, Peoples and organizations involved, Role and responsibility of them, (Owner, Engineers, Architects, Contractor, Consultant, Govt departments)	(06 Hours)
UNIT - IV	Approvals required for Civil Engineering Construction Projects: Introduction, Different approvals required for Civil Engineering construction projects, different stages of the projects and approval required at every stage, Authorities for giving approvals, Necessity & Importance of approval, the	(06 Hours)

	procedure for approvals	
UNIT - V	Recent Developments in Civil Engineering Introduction to Automation and mechanization in construction industry – Advantages and Disadvantages, Use of Precast and Pre-Fabrication in Civil Engineering Industry, Concept and Elements of SMART cities, Intelligent buildings, concept of low-cost housing, erection techniques of temporary structures.	(06 Hours)
UNIT - VI	Opportunities in Civil Engineering Introduction, Types of career roles for Civil Engineers, Certifications for Civil Engineering, Required Skill set for Civil Engineering, Employment Opportunities for Civil Engineers, Career path for Civil Engineers- Government sector, Public sector companies and Own start-ups.	(06 Hours)
Text Book:		
1	“Building Construction”-Rangwala,Charotar Publication	
2	“The Text Book of Building Construction”-S.P.Arora&S.P.Bindra-DhanpatRai Publication	
3	“Building Technology and Valuation”- TTTI Madras,Tata McGraw Hill Publication	
4	“Building Construction” by B.C.Punmia, Laxmi Publications.	
Reference Books:		
1	“My Construction Practices ”R.B.Chaphalkar	
2	“A to Z” Building Construction” Mantri Publications	
3	IS provisions “National Building Code”	
4	“Development Control Rules” of local plan sanctioning authority	
5	Calendar, “Time Saver Standards for Architectural Design”, Tata McGraw Hill Publishers	
6	Merit, “Building Design and Construction”, Tata McGraw Hill Publishers	
Syllabus For:		
Unit Test-I	UNIT – I, II, III	
Unit Test-II	UNIT- IV,V,VI	
List of Projects:		
Unit: I	Introduction to Civil Engineering	
1	1.Collection of Structural Information Historical structure of India: Visit, take photos, brows information and prepare report /chart	
2	Give day to day examples of Link of Civil Engineering with various discipline of Engineering: Photos in their day-to-day life they see about link of civil engineering with other discipline and write note in their own words on example they have seen (Minimum one example of link with each discipline)	
3	branches of Civil Engineer - Structural engineering, Construction engineering, Surveying and mapping engineering, Transportation engineering r, Environmental engineering, Hydraulic and irrigation engineering, Geotechnical engineering, Estimation and coasting, Project management: collect information on the branch of civil engineer of their choice and submit power point presentation	

Unit: II	Scope and role of Civil engineering	
4	Infrastructural development: Collect information on infrastructural development of country in last 6 years and prepare booklet on it	
5	Scope of Civil engineering in government sector: collect information on jobs in government sector, selection criteria process and exams for selection. Make a poster and display on notice board of department	
6	Scope of civil engineering in private sector and Role of civil engineering in society: collect information on jobs in private sector, make a poster and display on notice board of department	
Unit: III	Civil Engineering Project and Process	
7	Visit and take a interview of Civil Engineers, Architects, Contractor, Consultant, Govt departments and write your own observations of their work and share in for of class	
Unit: IV	Approvals required for Civil Engineering Construction Projects	
8	Different approvals required for Civil Engineering construction projects: make list of approvals requires brows the information about the process and prepare leaflet (Hard Copy)	
9	Authorities for giving approvals: visit any one approval authority of your place and prepare digital chart and mail to all staff and students of Department and take feed back	
10	Necessity & Importance of approval, the procedure for approvals: Prepare digital leaflet of necessity & importance of approval, the procedure for approvals and mail it to students and take feed back	
Unit: V	Recent Developments in Civil Engineering	
11	Present your ideas on low coast housing: Students have to build model of low coast house and need to explain its importance	
12	Present your ideas on Intelligent building: Students have to build model and explain concept.	
13	Present your ideas on Eco-Friendly building: Students have to build model and explain concept	
Unit: VI	Opportunities in Civil Engineering	
14	PPT on Required Skill set for Civil Engineering	
15	Own start-ups : Present idea of own start-up in front of class	
16	Software in civil engineering and its importance: collect information, download any one free software related to civil engineering and present its working in front of class	
17	Study the building structure where you live and write your observation along with photograph	
18	Study the traffic, traffic signals, parking on your way to college write your observation along with photograph	
19	Study Plumbing system of your house write your observation along with photograph	
20	Write a report on waste management in your house with photograph, discuss with your parents and improve waste management of your house.	

Syllabus

Programme: B.Tech Civil Sem - I (2021)

Course: GRAPHICS FOR CIVIL ENGINEERING

Course: GRAPHICS FOR CIVIL ENGINEERING		
<u>TEACHING SCHEME:</u>	<u>EXAMINATION SCHEME:</u>	<u>CREDITS ALLOTTED:</u>
Practical: 2 Hours / Week	End Semester Examination: -- Internal Assessment: --	Credits: --
	Term Work & OR: 50 Marks	Term Work & OR:01
		Total: 1
Course Pre-requisites: The students should have knowledge of		
1	Basics of Mathematics at Secondary School Level.	
Course Objectives:		
	To provide knowledge about	
	<ul style="list-style-type: none"> • Fundamentals of engineering drawing and curves • Isometric views and projection • Projections of points, lines, planes & solids • Use of CAD tools. 	
Course Outcomes: The student will be able to		
1	Understand dimensioning methods and drawing of engineering curves.	
2	Draw orthographic projections using 1 st angle method of projection*.	
3	Draw Isometric views from given orthographic projections*.	
4	Draw projection of Lines, its traces and projections of planes*.	
5	Draw projection of different solids*.	
6	Draw development of lateral surfaces of solids*.	
	*Using CAD tools	
Course Content:		
UNIT - I	Lines and Dimensioning in Engineering Drawing and Engineering Curves Different types of lines used in drawing practice, Dimensioning–linear, angular, aligned system, unidirectional system, parallel dimensioning, chain dimensioning, location dimension and size dimension. Ellipse by Arcs of Circles method, Concentric circles method. Involute of a circle, Cycloid. Introduction to Auto CAD commands.	(04 Hours)
UNIT - II	Orthographic Projections Basic principles of orthographic projection (First and Third angle method). Orthographic projection of objects by first angle projection	(04 Hours)

	method only. Procedure for preparing scaled drawing, sectional views and types of cutting planes and their representation, hatching of sections. (Using AutoCAD commands).	
UNIT - III	Isometric Projections Isometric view, Isometric scale to draw Isometric projection, Non-Isometric lines, and construction of Isometric view from given orthographic views and to construct Isometric view. (Using AutoCAD commands)	(04 Hours)
UNIT - IV	Projections of Points & Lines Projections of points, projections of lines, lines inclined to one reference plane, Lines inclined to both reference planes. (Lines in First Quadrant Only). (Using AutoCAD commands)	(04 Hours)
UNIT - V	Projections of Planes Projections of Planes, Inclination of the plane with HP, VP. (Using AutoCAD commands)	(04 Hours)
UNIT - VI	Projections of Solids Projection of prism, pyramid, cone and cylinder by rotation method. (Using AutoCAD commands)	(04 Hours)
Term Work:		
	All sheets should complete using AutoCAD.	
	1. Types of Lines, Dimensioning practice, free hand lettering, 1 nd and 3 rd angle method symbol.	
	2. Engineering Curves	
	3. Orthographic Projections	
	4. Isometric Views	
	5. Projections of Points and Lines	
	6. Projections of Planes	
	7. Projections of Solids	
Text Books / Reference Books:		
1. "Elementary Engineering Drawing", N. D. Bhatt, Charotar Publishing house, Anand India,		
2. "AutoCAD 2020 Beginning and Intermediate", Munir Hamad, Mercury Learning & Information Publication, 2019.		
3. "Engineering Drawing and Graphics", Venugopal K., New Age International publishers.		
Reference Books		
1. "Text Book on Engineering Drawing", K. L. Narayana & P. Kannaiah, Scitech Publications, Chennai.		
2. "Fundamentals of Engineering Drawing", Warren J. Luzzader, Prentice Hall of India, New Delhi,		
3. "Engineering Drawing", M. B. Shah and B.C. Rana, 1 st Ed, Pearson Education, 2005		
4. "Engineering Drawing", P. J. Shah, C. Jamnadas and Co., 1 st Edition, 1988		
5. "Engineering Drawing (Geometrical Drawing)", P. S. Gill, 10 th Edition, S. K. Kataria and Sons, 2005		

Syllabus

Programme: B.Tech Civil Sem - I (2021)

WORKSHOP TECHNOLOGY			
Teaching Scheme:	Examination Scheme:		Credits Allotted
Theory: - 00 Hours/ Week	End Semester Examination	-----	Theory: 00
Practical: -02 Hours/ Week	IA	-----	
	Term Work	50 Marks	Term Work: 01
	Total	50 Marks	01
Course Pre-requisites: -	Students should have basic knowledge of hand tools used in day to day life.		

Course Objectives:	
The Student should	
1. To acquire the knowledge of basic manufacturing processes.	
2. To identify tools, work material and measuring instruments useful for sheet metal, welding, carpentry, plumbing and Piping practice.	
Course Outcomes:	
The students should be able to	
1.	Understand the basic Manufacturing Processes used in the industry.
2.	Understand various tools and apply suitable tools for suitable operations in civil work.
3.	Understand the importance of safety.

Term work shall consist of any three jobs and demonstrations on rest of the trades, journal consisting of five assignments one on each of the following topics.
Plumbing and Pipe fitting Shop: Study of Pipe joints, Pipe fitting, Cutting, Threading and Laying of pipes. Different tools and equipment like pipe vice, pipe bending machine, dies and die holder, plumbing vice, cutting dies, pipe wrench, ball peen hammer etc. are used for plumbing operations on G.I. pipe.
Welding Shop: Electric arc welding, Study of tools and Operations, Edge preparations, Types of welding joints, Exercises making of various joints. safety practices and general guidelines.
Joining methods: Study of tools and Operations of riveting , Fabrication of toolbox, tray, electrical panel box etc. and study of bolts. joints by bolting etc.
Carpentry Shop: Introduction to wood working, Study of tools and Operations and carpentry joints, Simple exercise using jack plain. To prepare half lap corner joint, mortise and Tennon joints, Simple exercise on woodworking lathe. Safety practices and general guidelines.

Plastic Molding shop: Introduction to plastic molding. types of plastics. types of plastic molding. Exercise on plastic molding machine.

Text Books/ Reference Books

- O.P.Khanna , A Text Book of Welding Technilogy, Dhanpat Rai and Sons
- P.N.Rao , Manufacturing Technology- Vol I, mCgRAW Hill Education 9 India Pvt.
- Chapman W.A.J “ Workshop Technology “ volume I,II.III, ELBS.
- Hajra Choudhary S.K. , Bose S.K. “Elements of Workshop Technology” Volume I,II
- Begman, Manufacturing Processes.

Syllabus

Programme: B.Tech (Civil) Sem – I(2021)

Course: Fundamentals of Problem Solving Logic(Using C)		
<u>TEACHING SCHEME:</u>	<u>EXAMINATION SCHEME:</u>	<u>CREDITS:</u>
Theory: -- Tutorial: --	Semester End Examination: -- Internal Assessment: --	Credits: --
Practical: 2 Hours / Week	Term Work: 25 Marks Oral: --	Credits: 1
Course Pre-requisites: The students should have knowledge of		
1	Basic knowledge of Computer Handling	
Course Objective:		
1	To provide an overview of computers and problem-solving methods using 'C' Language	
2	To serve as a foundation for the study of programming languages.	
Course Outcomes: The student will be able to		
1	Know computer systems	
2	Understand concept and steps towards problem solving	
3	Understand fundamental concepts of C programming language	
4	Use decision control structures	
5	Use modular programming approach	
6	Use of arrays and structures	
Course Content:		
UNIT - I	Introduction to Computing: Components of Computer Systems, Concept of hardware and software, Types of software, Concept of computing, data and information, Introduction to computer programming, Types of programming languages, Software Development Life Cycle	
UNIT - II	Problem solving Techniques: Steps in problem solving techniques: Define the problem, Formulate the mathematical model, develop an algorithm, Write the code for the problem, Test the program. Introduction to program planning tools- algorithm, flowcharts, pseudo codes	
UNIT - III	Programming language 'C': Features of C, basic concepts- header files, compiling and executing a C program, variables, data types, Operators- assignment, arithmetic, relational, logical, increment and decrement, Input and Output functions- print f and scan f	
UNIT - IV	Decision Control Structures in 'C': if-else statement, nested if-else, use of logical operators, Loop control structure: for, while, do-while loops, use of break and continue, Case control structure: switch case	
UNIT - V	Function: Types of functions, Function definition and declaration, function prototype, calling and returning function, passing values between	

	functions, standard library functions and user defined functions, passing array as function parameter, Recursive function.	
UNIT - VI	Arrays and structures in 'C': Concept, declaration, initialization, processing with array, one and multidimensional array, Strings. Structures in 'C': Concept, declaration, accessing structure elements, Array of structures, Pointer to structures, Uses of structures.	
Internal Assessment:		
	NA	
Term Work: Term-work will consist of following assignments		
1	Write a C program to check prime number and even-odd numbers	
2	Write a C program to print sum of digits 1 to 10	
3	Write a C program to swap two numbers	
4	Write a C Program to check whether an alphabet is vowel or consonant	
5	Write a C Program to Find the Length of a String without using string functions	
6	Write a C program to find area and circumference of circle	
7	Write a C program to accept the length of three sides of a triangle and to check triangle as equilateral or not	
8	Write a C program to implement linear search technique	
Oral/Practical:		
	NA	
Reference Books:		
1) Kanetkar, Yashavant P. Let us C. BPB publications, 2004.		
2) Brian W. Kernighan, Dennis M. Ritchie, "The C Programming Language", Prentice Hall, ISBN 0131103628, Second Edition		
3) Donald E. Knuth, "The Art of Computer Programming", Vols. 1, Addison-Wesley, ISBN13: 978-0201485417, ISBN-10: 0201485419		
4) T. E. Bailey, "Program design with pseudo code", Brooks/Cole Publisher, ISBN-10: 0534055745, ISBN-13: 978-0534055745		
5) Subrata Saha and Subhodip M., "Basic Computation and Programming with C", Cambridge University of Press, India, ISBN:9781316601853		
6) Lamey Robert, "Logical problem solving", Prentice Hall, ISBN: 9780130618825		
7) Henry Mullish, Herbert L. Cooper, "The Spirit of C", Thomson Learning, ISBN 0314285008		

Syllabus
Programme: B.Tech Civil Sem - II Course (2021)

Course: Integral Calculus		
<u>TEACHING SCHEME:</u>	<u>EXAMINATION SCHEME:</u>	<u>CREDITS ALLOTTED:</u>
Theory: 4 Hours / Week	End Semester Examination: 60 Marks Internal Assessment: 40 Marks	Theory: 4
Tutorial: 1 Hour / Week		Tutorial:-01
Course Pre-requisites: The students should have knowledge of		
1	Student should have Basic Knowledge of differential calculus	
Course Objectives:		
To study	1. Methods to evaluate first order, first degree differential equations and its applications in engineering problems. 2. Distinct co-ordinate systems, fourier series and curve tracing. 3. Various techniques for integral calculus and its applications in engineering problem.	
Course Outcomes: The student will be able to		
1	Understand and evaluate first order and first degree differential equations.	
2	Understand the formulation of physical systems as first order, first degree differential equation and evaluate particular solution of it	
3	Understand the Fourier series and apply it to represent periodic function	
4	Understand and evaluate methods of integral calculus and curve tracing.	
5	Understand co-ordinate system and apply it to solve locus problems.	
6	Understand concept of multiple integral and apply it to evaluate area, volume, centre of gravity and moment of inertia.	
Course Content:		
Unit - I	Differential Equations (DE): Definition, Order and Degree of DE, Formation of DE. Solutions of Variable Separable DE, Exact DE, Linear DE and reducible to these types	(08 Hrs)
Unit - II	Application of DE: Applications of DE to Orthogonal Trajectories, Newton's Law of Cooling, Kirchoff's Law of Electrical Circuits, Motion under Gravity, Rectilinear Motion, One-Dimensional Conduction of Heat.	(08 Hrs)
Unit - III	Fourier Series: Definition, Dirichlet's conditions, Fourier Series and Half Range Fourier Series, Harmonic Analysis. Integral Calculus: Differentiation Under the Integral Sign, Error functions.	(08 Hrs)
Unit - IV	Integral Calculus: Reduction formulae, Beta and Gamma functions Curve Tracing: Tracing of Curves, Cartesian, Polar. Rectification of Curves	(08 Hrs)
Unit - V	Solid Geometry: Cartesian, Spherical Polar and Cylindrical Coordinate Systems. Sphere, Cone and Cylinder	(08 Hrs)
Unit - VI	Multiple Integrals and their Applications: Double and Triple integrations, Applications to Area, Volume, Mean and Root Mean Square	(08 Hrs)

Syllabus
Programme: B.Tech Civil Sem - II Course (2021)

	Values.	
Text Books:		
1. Higher Engineering Mathematics by B.V. Ramana (Tata McGraw-Hill), Edition ,2008.		
2. Applied Mathematics (Volumes I and II) by P. N. Wartikar & J. N. Wartikar (Pune Vidyarthi GrihaPrakashan, Pune), 7 th Edition, 1988, Reprint 2010.		
Reference Books:		
1. Advanced Engineering Mathematics, 2e, by M. D. Greenberg (Pearson Education), 2 nd ,Edition, 2002.		
2. Advanced Engineering Mathematics by Erwin Kreyszig (Wiley Eastern Ltd.), 8 th Edition, 1999, Reprint 2010.		
3. Advanced Engineering Mathematics, Wylie C.R. & Barrett L.C. (McGraw-Hill, Inc.) , 6 th Edition, 1995		
4. Higher Engineering Mathematics by B. S. Grewal (Khanna Publication, Delhi), 42 th Edition ,2012.		
Syllabus for		
Unit Test-I - UNIT – I, II, III		
Unit Test-II - UNIT- IV, V, VI		
Project Based learning topics for Integral Calculus:		
Students are expected prepare report on any one topic, write its definition, applications and illustrate with few examples. Also, write pseudo code/proof for it, wherever applicable.		
1. Formation of differential equation		
2. Exact differential Equation		
3. Linear differential equation		
4. Newton’s law of cooling		
5. Newton’s second law of motion		
6. Fourier’s law		
7. Kirchhoff’s voltage law		
8. Fourier series		
9. Harmonic analysis		
10. Gamma and beta function		
11. Curve tracing		
12. Locating position in three dimensional space		
13. Multiple integrals applications		
14. Error function		
15. Differentiation under integral sign		

Syllabus
Programme: B. Tech. Civil Sem - II Course (2021)

Course: Applied Chemistry		
TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS:
Theory: 03 Hours/Week	Semester End Examination: 60Marks Internal Assessment: 40Marks	Theory :03
Practical: 02 Hours / Week	Term Work: 25 Marks	Term Work: 01
Course Pre-requisites: The students should have knowledge of		
1	Corrosion, water and wastewater	
2	air pollution and air polluting parameters	
3	properties of cement, fuel cell, solar cell and alloys	
Course Objective:		
	The student should be able to determine properties of water, cement and metal.	
Course Outcomes: The student will be able to		
1	Apply their knowledge for protection of different metals from corrosion.	
2	Develop innovative methods to produce soft water for industrial use and potable water at cheaper cost.	
3	Identify the sources of air pollution and its implications on the environment.	
4	To learn fundamentals of energy storage systems such as battery, solar cell	
5	Outline the importance of testing of cement and its properties and applications.	
6	To understand and analyze the necessity of making an alloy and its applications in various industries.	
Course Content:		
Unit - I	Corrosion And Corrosion Protective Treatments: Introduction, Definition, Types of corrosion, Mechanism of wet corrosion, Protection of Corrosion like, Metallic coatings, Electroplating, Methods of cleaning articles before electrode position, Electroplating methods, Electro less plating, Some electro less plating's, Some other metallic, coatings, Chemical conversion coatings, Organic Coatings, Paints, Varnishes, Enamels, Special paints.	(06-Hrs)
Unit - II	Water And Waste Water Chemistry Introduction, Hardness of water, characteristics imparted by impurities, Analysis of contaminants, Treatment of Water by Zeolite, L-S process, Boiler feed water, Wastewater treatment. Green Chemistry: Definition, Twelve principles of Green Chemistry.	(06-Hrs)
Unit - III	Air Pollution And its Analysis : Pollutants and their sources, pollution by SO ₂ , CO ₂ , CO, NO _x , H ₂ S and other foul-smelling gases. Methods of estimation of CO, NO _x , SO _x and control procedures. Green House effect and Global warming, Ozone	(06-Hrs)

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Programme: B. Tech. Civil Sem - II Course (2021)

	depletion by oxides of nitrogen, chlorofluorocarbons and Halogens, removal of sulphur from coal. Control of particulates. Acid Rain, Green house effects, Depletion of Ozone	
Unit - IV	Industrial Practice: Energy Storage Device : Solar cell, Fuel cells, Construction and Working of - Acid and Alkaline Storage Battery, Dry Cell, Ni-Cd Batteries, Ni-Mn Batteries, Li-Ion Batteries, Lead – Acid Batteries.	(06-Hrs)
Unit - V	Cement : Definition, Classification and properties - Natural, Pozzolana & Port land Chemical constituent of Portland cement. Manufacture of Portland cement by wet process. Manufacture of Portland cement by dry process (using flow sheet diagram)Setting& Hardening of Portland cement with chemical reaction. Heat of hydration of cement. Properties and applications of Portland cement, Nano cement Chemical Reactions of Portland Cement, Cement/Water Reaction, Carbonation Reactions, Hydration Reaction Mechanism, Hydration Reaction on Aluminates, Fly ash reaction.	(06-Hrs)
Unit - VI	Alloys : Introduction, Necessity (Purpose) of making alloys, Classification of alloys. Preparation of alloys – Fusion method, Electro deposition method, Composition, Properties & Application of following - (i) Brass (ii) Bronze (iii) Duralumin (iv) Nichrome (v) Steel – Mild, Medium & High.	(06-Hrs)
Term Work: (Experiments)		
1	Determination of dissolved oxygen in water.	
2	Determination of hardness of a given water sample by using EDTA	
3	Measurement of chloride, sulphate and salinity of water samples by Simple titration method. (AgNO ₃ and potassium chromate)	
4	Determination of Ca from cement	
5	To determine the strength of given acid using pH titrations.	
6	Determination of Biochemical Oxygen Demand (BOD)	
7	Study of corrosion of metals in medium of different pH.	
8	To learn the specific charge/discharge characteristics of a Lithium- ion (Li- ion) battery through experimental testing of a remote triggered Li- ion Battery.	
9	To Prepare Phenol formaldehyde/Urea formaldehyde resin.	
10	To study set up of Daniel Cell	
11	Determination of Biological Oxygen Demand (BOD)	
12	To determine pH of soil	
13	To determine Acidity of soil	
14	To Study Lead – Acid Battery	
15	Preparation of borax/ boric acid.	
Assignments:		
Six assignments to be given by the subject teacher (Theory)-one from each unit		

Syllabus
Programme: B. Tech. Civil Sem - II Course (2021)

Reference Books:
1.A Text Book of Engineering Chemistry, Shashi Chawla, Dhanpat Rai & Co, 2004
2.Engineering Chemistry (16th Edition) Jain& Jain, Dhanpat Rai Publishing Company, 2013.
3.Jain P.C & Jain Monica, Engineering Chemistry, Dhanpat Rai & Sons, Delhi, 1992.
4.Bhal&Tuli, Text book of Physical Chemistry (1995), S. Chand & Company, New Delhi.
5.O. G. Palanna , Engineering Chemistry, Tata McGraw-Hill Publication, New Delhi.
6.S. S. Dara, A textbook of Engineering Chemistry, McGraw-Hill Publication, New Delhi.
7.Barrow G.M., Physical Chemistry, McGraw-Hill Publication, New Delhi.
8.Shikha Agarwal, Engineering Chemistry- Fundamentals and applications, Cambridge Publishers - 2015.
9.WILEY, Engineering Chemistry, Wiley India, New Delhi 2014.
Syllabus for Unit Test:
Unit Test -1 :UNIT – I to III
Unit Test -2 :UNIT – IV to VI
Topics for project based Learning for Applied Chemistry
1. Powder Coating methods used for prevention of metals from corrosion
2. Metallic Coating methods used for prevention of metals from corrosion
3. Analysis of various water contaminants
4. Treatment of water by Zeolite method.
5. To find various sources of air pollutants and its analysis.
6. Methods of estimation of CO, NO _x
7. Construction and Working of - Acid and Alkaline Storage Battery
8. Construction and Working of Dry Cell, Ni-Cd Batteries
9. Manufacturing of Portland Cement.
10. To study the properties and applications of Portland cement.
11. Preparation of alloys – Fusion method, Electro deposition method.
12. To study Composition, Properties & Application of (i) Brass (ii) Bronze (iii)Duralumin
13. To study manufacturing of mild steel.
14. To analyze waste water .
15. To determine hardness of water and its ill effects.

Syllabus
Programme: B. Tech. Civil Sem - II Course (2021)

Course: Statics and Dynamics		
TEACHING SCHEME:	EXAMINATION SCHEME:	Total CREDITS: 05
Theory: 04 Hours / Week	Semester End Examination: 60 Marks Internal Assessment: 40 Marks	Theory:04
Practical: 02 Hours / Week	Term Work: 25 Marks	Term work: 01
Course Pre-requisites: The students should have knowledge of		
1	Physics-Forces, Newton's law of motion, Concept of physical quantities, their units and conversion of units, Scalar and Vector	
2	Mathematics-Algebra, Geometry, Concept of differentiation and integration	
Course Objective:		
	The student should be able to determine effect of forces on rigid objects in static and dynamic state.	
Course Outcomes: The student will be able to		
1	calculate resultant and apply conditions of equilibrium.	
2	calculate friction force and its effect.	
3	analyze the truss	
4	calculate centroid and moment of inertia.	
5	evaluate kinematic effect of forces	
6	evaluate kinetic effect of forces	
Course Content:		
Unit - I	Resultant and Equilibrium Types and Resolution of forces, Moment and Couple, Free Body Diagram, Types of Supports, Classification and Resultant of a force system in a Plane - Analytical and Graphical approach. Equilibrant, Conditions of Equilibrium, Equilibrium of a force system in a Plane, Force and Couple system about a point.	(08Hrs)
Unit - II	Friction Coefficient of Static Friction, Impending motion of Blocks, Ladders and Belts.	(08 Hrs)
Unit - III	Analysis of Truss Analysis of Perfect Trusses - Method of Joint, Method of Section and Graphical Method.	(08 Hrs)
Unit - IV	Centroid and Moment of Inertia Centroid of line and plane areas, Moment of Inertia of plane areas, parallel and perpendicular axis theorem, radius of gyration, least moment of inertia.	(08 Hrs)
Unit - V	Kinematics of a Particle Cartesian components, Normal and Tangential components of motion, Relative motion, Dependent motion, Motion of a Projectile,	(08 Hrs)
Unit - VI	Kinetics of a Particle D'Alemberts Principle, Work-Energy Principle and Impulse-Momentum Principle, Coefficient of Restitution, Direct Central Impact.	(08 Hrs)
Assignments:		
	1) Explain different types of forces and types of supports.	
	2) Calculate resultant of given force system	

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	3) Calculate support reactions of the beam	
	4) What is equilibrium? What are conditions of equilibrium?	
	5) Calculate friction force for Blocks and Ladders.	
	6) Calculate tension on sides of Belts.	
	7) Calculate forces in members of truss.	
	8) Calculate centroid of given area.	
	9) Calculate moment of inertia of given area.	
	10) Calculate relative velocity of bodies.	
	11) Calculate motion and path of projectile.	
	12) Apply D'Alemberts Principle to solve given problem.	
	13) Apply Work-Energy Principle to solve given problem.	
	14) Apply Impulse-Momentum Principle to solve given problem.	
	15) Calculate velocity of bodies after impact.	
Term Work: The term-work shall consist of -		
	Part-A: Minimum Five experiments from list below.	
	1) Study of equilibrium of concurrent force system in a plane	
	2) Determination of reactions of Simple and Compound beam.	
	3) Determination of coefficient of friction for Flat Belt.	
	4) Determination of coefficient of friction for Rope.	
	5) Determination of Centroid of line or plane elements.	
	6) Study of Curvilinear motion.	
	7) Determination of Coefficient of Restitution.	
	Part-B: Minimum Five graphical solutions of the problems on different concepts in course content.	
Reference Books:		
	1) Hibbeler R.C., "Engineering Mechanics (Statics and Dynamics)", McMillan Publication	
	2) Beer F.P. and Johnston E.R., "Vector Mechanics for Engineers-Vol.-I and Vol.-II (Statics and Dynamics)", Tata McGraw Hill Publication.	
	3) Bhavikatti S.S. and Rajashekarappa "Engineering Mechanics", K.G., New Age International (P) Ltd.	
	4) Shames I.H., "Engineering Mechanics (Statics and Dynamics)", Prentice Hall of India (P) Ltd.	
	5) Singer F.L., "Engineering Mechanics (Statics and Dynamics)", Harper and Row Publication	
	6) Meriam J.L. and Kraige L.G., "Engineering Mechanics (Statics and Dynamics)", John Wiley and Sons Publication	
	7) Timoshenko S.P. and Young D.H., "Engineering Mechanics (Statics and Dynamics)", McGraw Hill Publication	
	8) Tayal A.K., "Engineering Mechanics (Statics and Dynamics)", Umesh Publication	
	9) Mokashi V.S., "Engineering Mechanics-I and II (Statics and Dynamics)", Tata McGraw Hill Publication	
Syllabus for Unit Test:		
	Unit Test -1 :UNIT – I to III	
	Unit Test -2 :UNIT – IV to VI	
Topics for Project based Learning for Statics and Dynamics		

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1. Prepare model for various types of beams.
2. Prepare model for various types supports.
3. Prepare chart for various types of force system with suitable real-life examples.
4. Collect the various situations where varignon's theorem is used.
5. Prepare model or chart for equilibrium system of forces of various engineering applications.
6. Prepare chart for different types for trusses with showing various members.
7. Prepare prototype model of any one type of truss.
8. Calculate the forces in members of truss by using analytical method and check it graphically (At least three problems for different types of trusses)
9. Prepare chart of method of joint and method section for analysis of truss with stepwise procedure.
10. Prepare prototype models of the basic geometrical figures and locate the centroid of them.
11. Prepare prototype models of the I and T section and locate the centroid of them.
12. Prepare chart for parallel axis and perpendicular axis theorem with suitable example.
13. Prepare chart regarding the types of friction in various field conditions.
14. Prepare chart for application of friction.
15. Prepare chart for derivation of tangential and normal acceleration.
16. Prepare chart related to projectile motion with suitable example.
17. Development of excel sheet for projectile motion (at least three problems).
18. Development of excel sheet for work energy principle (at least three problems).
19. Prepare chart for work energy and Impulse momentum principle with suitable example.
20. Development of excel sheet for calculation of coefficient of restitution (at least three problems)

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Basic Land Surveying		
<u>TEACHING SCHEME:</u>	<u>EXAMINATION SCHEME:</u>	<u>CREDITS ALLOTTED: 05</u>
Theory: 04Hours / Week	End Semester Examination: 60 Marks	Theory: 04 Credits
Practical: 02Hours / Week	Internal Assessment: 40 Marks	
	Termwork & Practical:: 75 Marks	TW & PR: 01 Credits
Course Pre-requisites:		
The Students should have knowledge of		
1.	Basic Mathematics and geometry	
Course Objectives:		
	To develop the knowledge of basic Surveying techniques required for various construction projects.	
Course Outcomes:		
On completion of the course, the students will be able to:		
1.	Use instruments for linear measurements and prismatic compass for angular measurements.	
2.	Use instruments for levelling and compute reduced levels of ground points	
3.	Use Vernier theodolite for angular measurements and for other applications.	
4.	Use of Tacheometer for computation of distances and reduced levels. Use plane table and its accessories for surveying.	
5.	Set out simple circular curves by various methods.	
6.	Conduct surveys for various construction projects and explain use of modern instruments.	
UNIT - I	Linear measurements and Compass survey	(8Hours)
	Principle, objectives and classification of Surveying. Linear measurements, methods, types of tapes, ranging, field work and plotting. Principle and working of EDM. Compass Survey: types of meridians and bearings, construction and use of prismatic compass, local attraction and its correction, dip and declination.	
UNIT - II	Vertical measurements	(8Hours)
	Introduction, types of levels, principle axes of levels, auto level and its working, temporary and permanent adjustments of auto-level, types of levelling staves, computation of reduced levels, profile levelling and cross sectioning. Contouring – direct and indirect methods, uses of contour maps. Introduction to trigonometrical levelling.	
UNIT - III	Theodolite Survey	(8Hours)
	Study and use of Vernier 20” theodolite, principle axes and temporary adjustments, measurements of horizontal angles by repetition and reiteration method, measurement of vertical angles and other uses, theodolite traversing: computation of consecutive and independent coordinates, adjustment of closed traverse by transit and Bowditch rule, simple cases of omitted measurements.	
UNIT - IV	Tacheometry and Plane Table Survey	(8Hours)

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	Principle of stadia tacheometry, fixed hair method with vertical staff to determine horizontal distances and elevations of points. Plane table survey, equipment's their uses, methods of plane table survey- radiation, intersection, traversing and resection, errors and precision of plane table survey.	
UNIT - V	Curves	(8Hours)
	Necessity of providing curves, simple circular curves, elements, setting out circular curves by radial and perpendicular offsets, offsets from long chord and offsets from chords produced. Angular method of deflection angles. Transition curves, necessity and types.	
UNIT - VI	Construction Survey and modern equipment's	(8Hours)
	Setting out buildings, survey for roads and tunnels, survey for drainage line, location of bridge piers. Introduction to Total station and its uses, use of digital planimeter for area measurement, study and use of toposheets.	
Assignments:		
1	Computation of corrected bearings of the traverse by different methods.	
2	Solving problems on calculation of reduced levels by different methods.	
3	Preparing contour map of the area from the given spot levels.	
4	Solving problems on trigonometrical leveling.	
5	Computations of independent coordinates of a closed traverse.	
6	Solving problems on omitted measurements.	
7	Calculation of reduced level and distance of a point by tacheometry.	
8	Write details of survey for drainage line with proper sketches.	
Term Work: The term work shall consist of Field book and drawing containing record of (any 12) exercises and project listed below.		
1	Linear measurements with tape and accessories.	
2	Study and use of Prismatic compass.	
3	Study and use of auto level and double check leveling	
4	Compound leveling and fly leveling, calculation by rise and fall method.	
5	Study and use of 20" Vernier Theodolite.	
6	Measurement of horizontal angle of triangle by repetition method and applying check.	
7	Measurement of vertical angle by transit Theodolite	
8	Trigonometrical levelling by transit Theodolite.	
9	Project 1 Road project of minimum length of 250 M including fixing of alignment, profile leveling and cross sectioning.(Two full imperial drawing)	
10	Project 2 Theodolite traverse survey of closed traverse for minimum 0.5	

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	hectares area including building roads etc. (One full imperial drawing)	
11	Computation of horizontal distance and elevation of points by tachometry for horizontal and inclined sights.	
12	Introduction and study of outfit of plane table and method of radiation.	
13	Intersection method of plane table survey.	
14	Closed plane table traverse survey around a small four-sided building.	
15	Setting out simple circular curve by Rankin's method of deflection angle	
Text Books		
1	Surveying and Levelling Vol I and. II-T.P. Kanetkar and S.V. Kulkarni.	
2	Surveying Vol. I & II - Dr. B.C. Punmia, Ashok K. Jain, Arun K. Jain.	
3	Surveying for Engineers- John Uren & Bill Price- Palgrave Macmillan	
4	Plane Surveying- A.M.ChandraNew age International Publishers	
5	Surveying and Levelling- N. N. Basak, Tata Mc-Graw hill	
6	Surveying Vol. I & II - Dr. K. R. Arora.	
Reference Books:		
1	Surveying: Theory and practice-James M. Anderson, Edward M. Mikhail	
2	Surveying theory and practices-Devis R. E., Foot F.S.	
3	Plane and Geodetic Surveying for Engineers. Vol. I -David clark.	
4	Principles of Surveying. Vol. I - J.G.Olliver, J.Clendinning	
5	Surveying Vol. I & II -S.K.Duggal, Tata Mc-Graw Hill.	
6	Surveying and Levelling - Subramanian, oxford University Press.	
Syllabus for :		
Unit Test-I	UNIT – I, II, III	
Unit Test-II	UNIT- IV,V,VI	
Project List :		
Unit I	Linear measurements and Compass survey	
1	Collect Information of Linear measurement techniques/ instruments from old age till 21 st century, write report along with photos	
2	Conduct closed traverse by prismatic compass and do the necessary calculations	
Unit II	Vertical measurements	
3	Prepare counter sheet by using Excel	
4	Collect Information of Vertical measurement techniques/ instruments from old age till 21 st century, write report along with photos	
5	Vist to laboratory and collect information of levelling instrument and make ppt.	
Unit III	Theodolite Survey	
6	Make a PPT on Problem Solved by Bowditch Rule and present it in class	

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7	Make a PPT on Problem Solved by transit Rule and present it in class	
8	Leaflet on uses of Theodolite	
Unit IV	Tacheometry and Plane Table Survey	
9	Write a report on- “ Is Tacheometry and Plane table are required in today’s digital world?”	
10	PPT on working of plane table	
11	Make vedio – of your own demonstrating parts and working of Tacheometry, share it with your classmate and take feed back	
12	Digital booklet on numerical of Tacheometry share it with your classmate and take feed back	
Unit V	Curves	
13	Take Photograph of Curves of road you usually use and make a poster and display it on Notice Board.	
14	Digital booklet on numerical of Rankine’s method of Curves share it with your classmate and take feed back	
15	Digital booklet on numerical of offset from long cord method of Curves share it with your classmate and take feed back	
Unit VI	Construction Survey and modern equipment’s	
16	Collect information of latest surveying instrument : its cost, salient features and image and prepare Chart and display it on notice board.	
17	Prepare Digital Chart on Importance of Basic Land Surveying in Civil Engineering share it and collect feed back	
18	Present your idea of modification of any survey instrument in front of class.	
19	Collect information on various software available for surveying	
20	Prepare leaflet on Surveying for various projects.	

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Programme: B.Tech Civil (2020)

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Course: Construction Design & Drawing		
<u>TEACHING SCHEME:</u>	<u>EXAMINATION SCHEME:</u>	<u>CREDITS ALLOTTED: 04</u>
Theory: 3 Hours / Week	End Semester Examination: 60 Marks Internal Assessment: 40 Marks	Theory: 03 Credits
Practical: 2 Hours / Week	Term Work and Oral : 50 Marks	Term Work and Oral : 1 Credits
Course Pre-requisites: The students should have knowledge of		
1	Building Construction, Building materials, Knowledge of Engineering Graphics	
Course Objectives:		
	To make the student illustrate the process of building planning and building byelaws	
Course Outcomes: The student will be able to		
1	apply various Principals of planning and building byelaws.	
2	apply design considerations for climate, ventilation, Noise & Acoustics in building planning.	
3	apply design considerations for various building services & fire protection in building planning.	
4	apply design considerations for plumbing services in building planning.	
5	Understand the concept of .development plan	
6	define the legal aspects of plan sanctioning.	
Course Content:		
UNIT - I	Buildings Planning and Regulations Principles of planning for building, Integrated approach in Built Environment. Building Rules Regulations and Byelaws necessity, (National Building Code), plot size, open space around the building. FSI, Building line, control line. Height, room size, Built up area, floor area, carpet area. Rules of lighting ventilation, Drainage and Sanitation; Principles of Architectural design – form, function, utility, aesthetics.	(06 Hours)
UNIT - II	Types of Buildings (a)Types of Residential Building units – Bungalows, Twin bungalows, Row houses, Apartments; Requirements of Public buildings - Educational buildings, buildings for health care, industrial buildings and commercial buildings; Types of drawings - Submission drawings, working drawings and Architectural drawings, Perspective drawings. (b) Concept of ECO building, Green buildings, Intelligent building, Low Cost Housing, Planning considerations in High rise buildings.	(06 Hours)
UNIT - III	Climate, Ventilation and Acoustics Elements of climate, thermal design Principles, Heat exchange of building, Thermal insulation of roof and wall. Function of ventilation, stack effect wind effect, Mechanical ventilation, Air conditioning systems. Effect of noise, Noise control sound insulation, Acoustics reverberation Sabine's formula, acoustical defects, conditions of good acoustics.	(06 Hours)
UNIT - IV	Building Services Constructional requirements for different building services like Electrical, Telecommunication services, Circulation-Lift Types and Capacity, escalators,	(06 Hours)

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	Entertainment services. Fire Protection – Fire safety, fire load, grading of occupancies by fire load, fire escape elements. Plumbing services, fixtures and fastenings, Layout of water supply & drainage system, Rate of water supply, storage and distribution arrangement, Plumbing systems.	
UNIT - V	Necessity and evolution of town planning in India. Development plan and its importance, Various surveys for development plan Objectives and Contents of DP, Land use zoning, Concept of regional plan.	(06 Hours)
UNIT - VI	Legal Aspects of Plan Sanctioning Role of Plan Sanctioning Authority for layout, co-op Housing societies and apartments. Ownership of land, plot, 7/12 abstract, meanings of different terms of 7/12 abstract (Khasra), 6-D form, list of documents to be submitted along with building Plan for sanction from the authority. TDR, certificate of commencement and completion, various no objection certificates to be produced, format of permissions from pollution control board, MSEB, Water Supply and Drainage Department, State or National Highway Department.	(06 Hours)
Assignments: Students should perform theoretical / experimental assignment/s from the list below		
1	Assignment on Building Bye laws for residential buildings	
2	Requirements of Green and intelligent buildings	
3	Describe principles of Thermal design of buildings.	
4	Prepare a layout for water supply and drainage of residential building.	
5	Assignment on Development plan of a city	
6	State and describe various legal documents for building construction.	
Term Work:		
	Preparation of working drawings of any one of the buildings listed below: a) Residential Building b) Commercial Building c) Educational Building d) Industrial Building e) Recreational Building f) Health Club	
	Sheets to be drawn 1) Plan/Typical floor plan to a suitable scale. 2) Elevation and section to a suitable scale. 3) Site plan showing water supply and Drainage 4) Foundation Plan to a suitable scale.	
Text Books:		
1. S.P. Bindra S.P. Arora, "Building Construction", Laxmi Publication		
2. M. L. Shah, C. M. Kale, S. Y. Patki, "Building Drawing with integrated approach to Built Environment", Tata McGraw Hill Publishers		
3. Rangwala, "Town Planning", Charaotar Publications		
Reference Books:		
1. IS provisions "National Building Code"		

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2. "Development Control Rules" of local plan sanctioning authority	
3. Calendar, "Time Saver Standards for Architectural Design", Tata McGraw Hill Publishers	
4. Merit, "Building Design and Construction", Tata McGraw Hill Publishers	
Syllabus for	
Unit Test-I	UNIT – I, II, III
Unit Test-II	UNIT- IV, V, VI

Project Based Learning

- 1 Study of National Building code of India to find Building Bye laws for planning residential buildings.
2. With the help of 3 different case studies of residential buildings study the application of Principles of building planning.
- 3 Preparing a measured drawing of a two bed room residential building (Plan, Elevation and section)
- 4 Take case study of green building and study provisions with reference to energy saving, solid waste management, recycling of water, use of green building materials.
- 5 With the help of site visit determine planning requirements for health care buildings and prepare a report.
6. With the help of site visit determine planning requirements for commercial buildings and prepare a report.
- 7 Study the architectural and working drawings for a building construction project and prepare a report.
- 8 With the help of site visit prepare a plumbing layout of a residential building and study various fixtures for plumbing.
- 9 Study of fire safety arrangements for high rise buildings and prepare a report.
- 10 Study the process of preparing development plan of a city and prepare a report.
- 11 With the help of case study prepare a report on zoning in Development plan.
- 12 With the help of site visit determine planning requirements for recreational buildings and prepare a report.
13. Take a case study of intelligent building and study various provisions and prepare a report.
- 14 Study the foundation plan of a residential building and prepare a report on lineout of a building.
- 15 Study the electrical layout plan of a building construction project and prepare a report.
16. Study of various legal documents such as 7/12 extract, TDR certificate, completion certificate.
17. With the help of site visit determine planning requirements for primary school building and prepare a report.
18. Study development control rules of the local authority and prepare a report.
- 19 With the help of site visit determine planning requirements for high rise building and prepare a report.
- 20 Study of Landscape details in a residential complex and prepare a report.

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Programme: B.Tech Civil (2020)

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Syllabus
Programme: B. Tech. Civil Sem - II Course (2021)

Course: Civil Engineering Software – I (AutoCAD)		
<u>TEACHING SCHEME:</u>	<u>EXAMINATION SCHEME:</u>	<u>CREDITS ALLOTTED: 01</u>
Practical: 02 Hours / Week	Term Work & Practical : 50 Marks	TW & PR :01
Course Pre-requisites: The students should have knowledge of		
1	Knowledge of basic building aspects	
2	Knowledge of various building components.	
3	Knowledge of various building symbols	
Course Objectives:		
	To make student capable of drawing any kind of Engineering drawing using AutoCAD.	
Course Outcomes: The student will be able to		
1	draw various Engineering drawing using AutoCAD.	
2	draw various elements of a building.	
3	draw various elevation and sections of the building.	
4	Draw and explain various modelling concepts of building construction and building drawing by using AutoCAD.	
Course Content:		
UNIT - I	Introduction to AutoCAD and Command: Introduction to AutoCAD, Basic AutoCAD commands- Line, Circle, Polyline, Rectangle, Polygon, Array, Trim, Offset, Fillet, Changers, Units, Limits, Move, Copy, Paste, Drawing space, Layout, Model.	
UNIT - II	Simple Plan Drawing: Small bungalow plan scaled print out on A3 sheet, 1 BHK and 2 BHK Flats and bungalow plans, Elevation and Section.	
UNIT - III	3D Drawing: 1 BHK Bungalow plans, 3D Truss, 3D Industrial shed, Steel drawing for bungalow.	
Term Work:		
	The term-work shall consist of:	
	1) AutoCAD Drawing of small objects	
	2) AutoCAD Drawing of plan, elevation and section of small building.	
	3) AutoCAD 3D view of small building.	
Text Books:		
“ Mastering AutoCAD 2016 and AutoCAD LT 2016 by Goerge Omura”		
“ Mastering AutoCAD 2017 and AutoCAD LT 2017 by Goerge Omura”		
“ Mastering AutoCAD 2018 and AutoCAD LT 2018 by Goerge Omura”		
“AutoCAD 2018 Instructor perfect paperback by james A. Leach”		
“Beginning AutoCAD Exercise workbook 2018 by Cheryl R. Shrock”		
Reference Books:		
“AutoCad : 2D Reference guide : 1 Paperback=1 january 2010 by C. S. Changeriya”		
“AutoCAD 14 (The Complete Reference) Paperback – Import, 1 December 1998 by David S. Cohn”		

Syllabus
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Course: Object-Oriented Programming (Using C++)		
TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS:
Practical: 2 Hours / Week	Term Work: 25 Marks	Term Work: 1
Course Pre-requisites:		
1	The students should have basic Knowledge of “C” programming language.	
Course Objective:		
	Students will be able to do basic program in C++	
Course Outcomes: The student will be able to		
1	Explain different Concepts of OOP, Characteristics of OOP.	
2	Demonstrate the use of Data type , Keywords ,Tokens and Control Structures to Solve given Problem.	
3	Demonstrate the use of functions to solve real world problem.	
4	Compare different types of inheritance to solve given problem.	
5	Explain different Types of Constructor and Destructor.	
6	Develop OOP applications using file Handling.	
Course Content:		
Unit -I	Introduction to Object Oriented Programming: Introduction to Object Oriented Programming, Basic Concept of OOP, Characteristics of OOP, Need for OOP, Benefits of OOP, Object Oriented Languages, Applications of OOP.	
Unit -II	Beginning with C++: Overview of C++, Sample C++ Program, C++ statements, Structure of C++ program, Creating source file , compiling and Linking C verses C++, C++ Characteristics, Structure of C++ program, Tokens, Keywords , Identifiers and Constants, Data Types ,Declaration of variables, Dynamic initialization of variables, Control Structures.	
Unit -III	Functions in C++: Function Prototyping, Call by Reference, Inline functions, Default arguments, Function Overloading , Friend and Virtual Functions . Classes and Objects: Class specification , Class Objects , Scope resolution operator, Access specifies Public, Private, Protected, Defining member Functions, Nesting of Member Functions, Private Member Functions, Static Data Members , Static Member Functions,	
Unit - IV	Inheritance and Polymorphism: Defining Derived Classes, Types of Inheritance, Virtual Base Class, Abstract class. Polymorphism: Base class, Virtual Functions, Pure Virtual Functions, Calling a virtual function through a base class reference, Early and Late Binding.	
Unit - V	Constructors and Destructors: Constructors, Parameterized constructors, Default Constructors, Copy constructor, Dynamic Initialization of Objects, Destructors.	
Unit - VI	Managing Console I/O operations: C++ Stream Classes, Unformatted I/O Operations, Working with Files, Opening and Closing a file, Formatted I/O.	

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Term Work:		
1.	Study of different Object Oriented Programming Concept ,Application and benefits of OOP.	
2.	Write a C++ program to find whether given number is perfect number or not.	
3.	Write a C++ Program to find Fibonacci Series.	
4.	Write a C++ Program to find Area of Circle and Triangle Using concept of Function Overloading.	
5.	Write a C++ program for simple Calculator using Class and Object Concept.	
6.	Write a C++ Program for Employee Management System Using Single inheritance, Multiple inheritance and Multilevel inheritance.	
7.	Write a C++ Program to implement Concept of Constructor and Destructor.	
8.	Write a C++ Program for Storing Student Information with the help of File reading and Writing Operations.	
Reference Books:		
1)	Herbert Schildt, "The Complete Reference C++", 4thEdition, Mc Graw Hill, 2003.	
2)	Stanley. B. Lippmann, Josee Lajoie, Barbara. E. Moo, "C++ Primer", 5th Edition, Pearson Education, 2013.	
3)	Scott Meyers:"Effective C++",Third Edition, Addison-Wesley, 2005.	
4)	E. Balaguruswamy, "Object Oriented Programming using C++", 4th Edition, Mc Graw Hill, 2010	