

**BHARATI VIDYAPEETH (DEEMED TO BE
UNIVERSITY), PUNEFACULTY OF ENGINEERING
and TECHNOLOGY**

Programme: B.Tech. (Civil) –Sem I -2020 Course

Sr.No.	Subject	Teaching Scheme (Hrs/Week)			Examination Scheme (Marks)								Credits		
		L	P/D	T	End Sem. Exam	Internal Assessment			TW	OR	Practical	Total	Theory	TW	Total
						Unit Test	Assignment	Attendance							
1	Engineering Mathematics - I	3	--	1	60	20	10	10	--	--	-	100	4	--	4
2	Engineering Physics	3	2	--	60	20	10	10	25	--	-	125	3	1	4
3	Engineering Graphics	4	2	--	60	20	10	10	25	--	-	125	4	1	5
4	Fundamentals of Electrical Engineering	3	2	--	60	20	10	10	25	--	-	125	3	1	4
5	Building Construction	3	2	--	60	20	10	10	25	--	-	125	3	1	4
6	Workshop Technology	--	2	--	--	--	--		25	--	-	25	--	1	1
7	ICT for Civil Engineering	--	2	--	--	--	--		50	25	-	75	--	1	1
8	Open Course I- Business Communication	2	--	--	50	--	--		--	--	-	50	2	--	2
	Total	18	12	01	350	150	50		175	25	-	750	19	6	25

**BHARATI VIDYAPEETH (DEEMED TO BE
UNIVERSITY), PUNEFACULTY OF ENGINEERING
and TECHNOLOGY**

Programme: B.Tech. (Civil) –Sem II -2020 Course

Sr.No.	Subject	Teaching Scheme (Hrs/Week)			Examination Scheme (Marks)								Credits		
		L	P/D	T	End Sem. Exam	Internal Assessment			TW	OR	Practical	Total	Theory	TW	Total
						Unit Test	Assignment	Attendance							
9	Engineering Mathematics - II	3	--	1	60	20	10	10	--	--	--	100	4	-	4
10	Engineering Chemistry	3	2	--	60	20	10	10	25	--	--	125	3	1	4
11	Surveying	3	4	--	60	20	10	10	25	--	25	150	3	2	5
12	Engineering Mechanics	3	2	--	60	20	10	10	25	--	--	125	3	1	4
13	Building Planning and Design	3	2	1	60	20	10	10	25	25	--	150	4	1	5
14	Civil Engineering Software – I	--	2	--	--		--		50	--	--	50	-	1	1
15	Open Course II-Soft Skills	2	--	--	50		--		--	--	--	50	2	-	2
	Total	17	12	2	350	150	50		150	25	25	750	19	6	25

Programme: B. Tech. (Civil) Sem – I 2020 course

COURSE: Engineering Mathematics -I		
TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS:
Theory: 03 Hours / Week Tutorial: 01 Hours / Week	End Semester Examination:60 Marks Internal Assessment: 40 Marks	Theory: 04
		Total: 04
Course Pre-requisites: The students should have knowledge of		
1	Algebra of matrices and its Determinants, Maxima and Minima of single variable functions.	
Course Objective: On completion of the course -		
	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: On completion of the course, the students 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 algebraicequations., 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)

	Errors and Approximations.		
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: Consist of Unit test 20 marks, Assignment 10 marks, Attendance 10 marks.			
	Unit Test -1	Unit No: I, II, III	
	Unit Test -2	Unit No: IV, V, VI	
Reference Books:			
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.		
3	Higher Engineering Mathematics by B.V. Ramana (Tata McGraw-Hill), Edition, 2008.		
4	Advanced Engineering Mathematics by Erwin Kreyszig (Wiley Eastern Ltd.), 8 th Edition, 1999, Reprint 2010.		
5	Advanced Engineering Mathematics, 7e, by Peter V. O'Neil (Thomson Learning), Edition 2007.		
	Advanced Engineering Mathematics, 2e, by M. D. Greenberg (Pearson Education), 2 nd Edition, 2002.		

COURSE: ENGINEERING PHYSICS		
TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS:
Theory: 03 Hours / Week Practical: 01 Hours / Week	End Semester Examination:60 Marks Internal Assessment: 40 Marks TW: 25 Marks	Theory: 03 TW : 01
		Total: 04
Course Pre-requisites: The students should have knowledge of		
1	Basic understanding of physics and calculus	
Course Objective: On completion of the course -		
1. 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: On completion of the course, the students 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	MODERN PHYSICS Motion of a charged particle in electric and magnetic fields, Electrostatic and Magnetostatic focussing, Electron microscope, Wavelength and resolution, Specimen limitation, Depth of field and focus, TEM, SEM and EDS, Separation of isotopes by Bainbridge mass spectrograph, CRT and CRO with applications.	(06 Hrs)
Unit-II	QUANTUM MECHANICS Dual nature of matter, De-Broglie hypothesis, Wavelength of matter waves, Davisson and Germer's experiment, concept of wave packet, group and phase velocity and relation between them, Heisenberg's uncertainty principle with illustrations, Physical significance of wave function, Schrodinger's time dependant and time independent wave equation, Application of Schrodinger's time independent wave equation to the problems of Particle in a rigid box and non rigid box.	(06 Hrs)
Unit-III	SOLID STATE PHYSICS Free electron theory, Density of states, Bloch theorem (Statement only), Origin of band gap, Energy bands in solids, Effective mass of electron, Fermi-Dirac probability function and position of Fermi level in intrinsic semi-conductors (with derivation) and in extrinsic semi-conductors, Band structure of p-n junction diode under forward and reverse biasing, Conductivity in conductor and semi-conductor, Hall effect and Hall coefficient, Photovoltaic effect, Solar cell and its characteristics	(06 Hrs)
Unit-IV	NANOSCIENCE Introductions of nanoparticles, properties of nanoparticles (Optical,	(06 Hrs)

	electrical, Magnetic, structural, mechanical), Wide band gap semiconductors, Quantum confinement effect, Quantum dots, CNT, Fullerene, synthesis of nanoparticles, synthesis of nanoparticles by physical-ball milling and chemical-co-precipitation, applications in the field of electronics, automobile and medicine.	
Unit-V	<p>INTERFERENCE interference due to thin film of uniform and nonuniform thickness, Engineering applications of interference (optical flatness, interference filter, non-reflecting coatings, multi-layer ARC.</p> <p>DIFFRACTION Diffraction at a single slit (Geometrical method), Conditions for maximum and minimum, Diffraction at a circular aperture (Result only), Plane diffraction grating, Conditions for principal maxima and minima.</p> <p>POLARISATION Introduction, Double refraction and Huygen's theory, Positive and negative crystals, Nicol prism, Elliptical and circular polarisation, Quarter and half wave plates, Application in LCD.</p>	(06 Hrs)
Unit-VI	<p>ARCHITECTURAL ACOUSTICS Elementary acoustics, Limits of audibility, Reverberation and reverberation time, Growth and decay of sound in a room, Sabine's formula, Pressure and Intensity level, Loudness and phon, Sone, Audibility curve, 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.</p>	(06 Hrs)
Internal Assessment: Consist of Unit test 20 marks, Assignment 10 marks, Attendance 10 marks.		
	Unit Test -1	Unit No: I, II, III
	Unit Test -2	Unit No: IV, V, VI
Term Work will consist of any Eight experiment from the following		
	1. Determination of band gap of semi-conductor	
	2. Solar cell characteristics.	
	3. E/m by Thomson's method	
	4. Uses of CRO for measurement of phase difference and Lissajous figures	
	5. Hall effect and Hall coefficient.	
	6. Conductivity by four probe method	
	7. Diode characteristics (Zener diode, Photo diode, LED, Ge/Si diode).	
	8. Plank's constant by photodiode	
	9. Wavelength by diffraction grating	
	10. Newton's rings.	
	11. Ultrasonic interferometer.	
	12. Sound intensity level measurement	
	13. Wavelength of laser by diffraction	

Reference Books:

1	A Textbook of Engineering Physics, <u>M N Avadhanulu</u> , <u>P G Kshirsagar</u> and <u>TVS Arun Murthy</u> , 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, <u>Arthur Beiser</u> , <u>Shobhit Mahajan</u> and <u>S. Rai Choudhury</u> , McGraw Hill Education (2017)
4	Fundamentals of Physics, Jearl Walker, David Halliday and Robert Resnick, John Wiley and Sons (2013)
5	Optics, Francis Jenkins and Harvey White, Tata Mcgraw Hill (2017)

COURSE: ENGINEERING GRAPHICS		
TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS:
Theory: 04 Hours / Week Practical: 02 Hours / Week	End Semester Examination:60 Marks Internal Assessment:40 Marks TW: 25 Marks	Theory: 04 TW : 01
		Total: 05
Course Pre-requisites: The students should have knowledge of		
1	Knowledge of basic geometry	
Course Objective: On completion of the course students will get knowledge -		
1	Fundamentals of engineering drawing and curves	
2	Use of CAD tools.	
Course Outcomes: On completion of the course, the students will be able to:		
1	Different engineering curves and dimension.	
2	Differentiate I st angle and III rd angle projection Method in orthographic projection.	
3	To interpret views of the object and to draw by using Isometric projection method.	
4	Projection of Lines, its traces and planes.	
5	Projection of different solids.	
6	Development of lateral surfaces of solids	
Course Content:		
Unit-I	Lines, Dimensioning 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 Circle method, Concentric circle method. Involute of a circle, Cycloid, Archimedean Spiral, Helix on cone & cylinder. Introduction to Auto CAD commands	(08 Hrs)
Unit-II	Orthographic Projections Basic principles of orthographic projection (First and Third angle method). Orthographic projection of objects by first angle projection method only Procedure for preparing scaled drawing, sectional views and types of cutting planes and their representation, hatching of sections.	(08 Hrs)
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.	(08 Hrs)
Unit-IV	Projections of Points, Lines and Planes Projections of points, projections of lines, lines inclined to one reference Plane, Lines inclined to both reference planes. (Lines in First Quadrant Only) Traces of lines, Projections of Planes, Angle between two planes, Distance of a point from a given plane, Inclination of the plane with HP, VP	(08 Hrs)
Unit-V	Projections of Solids Projection of prism, pyramid, cone and cylinder by rotation method.	(08 Hrs)
Unit-VI	Development of Lateral Surfaces of Solids Introduction to development of lateral surfaces and its Industrial	(08 Hrs)

	application, draw the development of lateral surfaces of cone, pyramid and prism.	
Internal Assessment: Consist of Unit test 20 marks, Assignment 10 marks, Attendance 10 marks.		
Unit Test -1	Unit No: I, II, III	
Unit Test -2	Unit No: IV, V, VI	
Term Work will consist of		
Any two sheets to be drawn using AutoCAD with printout on A3 size papers and remaining sheets should be completed in drawing hall manually on A2 size sheets.		
Sheets		
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 and planes		
6 Projection of Solids.		
7 Development of lateral surfaces		
Reference Books:		
1	Elementary Engineering Drawing", N.D. Bhatt, Charotar Publishing house, Anand India,	
2	Text Book on Engineering Drawing", K.L. Narayana & P. Kanniah, Scitech Publications, Chennai	
3	Fundamentals of Engineering Drawing", Warren J. Luzzader, Prentice Hall of India, New Delhi	
4	Engineering Drawing and Graphics", Venugopal K., New Age International publishers	
5	M.B. Shah and B.C. Rana, "Engineering Drawing", 1st Ed, Pearson Education, 2005	

COURSE: FUNDAMENTALS OF ELECTRICAL ENGINEERING		
TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS:
Theory: 03 Hours / Week Practical: 02 Hours / Week	End Semester Examination:60 Marks Internal Assessment: 40 Marks TW: 25 Marks	Theory: 03 TW : 01
		Total: 04
Course Pre-requisites: The students should have knowledge of		
1	Basic Physics	
Course Objective: On completion of the course students will get knowledge -		
1	Basic knowledge of Electrical Engineering	
Course Outcomes: On completion of the course, the students will be able to:		
1	Understand and apply knowledge of basic concepts of work ,power ,energy for electrical, mechanical and thermal systems	
2	Understand and apply knowledge of Kirchoff’s laws and network theorems to solve electrical networks	
3	Describe construction, principle of operation, specifications and applications of capacitors and batteries	
4	Describe and apply fundamental concepts of magnetic and electromagnetic circuits for operation of single phase transformer	
5	Define basic terms of single phase and three phase ac circuits and supply systems	
6	Know and use electrical bill and safety rules	
Course Content:		
Unit-I	Basic Electrical Concepts: Concept of EMF, Potential Difference, Ohm’s Law, SI units of work, power and energy, conversion of energy from one form to another (simple numerical problems on Thermal, electrical, potential and kinetic energy conversions) theorems in DC circuits: Kirchoff’s laws, Thevenin’s theorem, Maximum power transfer theorem	(08 Hrs)
Unit-II	Steady- State Analysis of Single Phase AC Circuits: AC Fundamentals: Sinusoidal, square and triangular waveforms – average and effective values, form and peak factors, concept of phasors, phasor representation of sinusoidally varying voltage and current. Analysis of series, parallel and series-parallel RLC Circuits: apparent, active & reactive powers, power factor, causes and problems of low power factor, power factor improvement; resonance in series and parallel circuits, bandwidth and quality factor (simple numerical problems).	(08 Hrs)
Unit-III	Introduction to Power System: General layout of electrical power system and functions of its elements, standard transmission and distribution voltages, concept of grid (elementary treatment only) Power generation to distribution through overhead lines and underground cables with single line diagram. Three Phase AC Circuits: Three phase system-its necessity and advantages, meaning of phase sequence, star and delta connections, balanced supply and balanced load, line and phase voltage/current relations, three-phase power and its measurement (simple	(08 Hrs)

	numerical problems).	
Unit-IV	Magnetic circuit concepts, analogy between electric & magnetic circuits, magnetic circuits with DC and AC excitations, magnetic leakage, B-H curve, hysteresis and eddy current losses, magnetic circuit calculations, mutual coupling. Single Phase Transformer: Principle of operation, construction, e.m.f. equation, equivalent circuit, power losses, efficiency (simple numerical problems), introduction to auto transformer	(08 Hrs)
Unit-V	Electrical Machines: Principles of electro mechanical energy conversion, DC machines: types, e.m.f. equation of generator and torque equation of motor, characteristics and applications of dc motors (simple numerical problems). Three Phase Induction Motor: types, Principle of operation, slip-torque characteristics, applications (numerical problems related to slip only).	(08 Hrs)
Unit-VI	Electrical Measurements and Installation: Introduction to Electrical instruments such as wattmeter, energy meter, Illumination: Energy meter, Study of Electricity Bill (Domestic and Commercial) , Elementary calculations of energy consumption and battery back up Domestic wiring: Service mains, meter board and distribution board. , Two- way and three-way control. Types of wires and cables; Types of Connectors & Switches; System of wiring, domestic and industrial wiring; Simple control circuit in domestic installation. Elementary discussion on Circuit protective devices: Switch fuse unit (SFU) and Miniature Circuit Breaker (MCB's), Moulded case circuit breaker (MCCB),	(08 Hrs)
Internal Assessment: Consist of Unit test 20 marks, Assignment 10 marks, and Attendance 10 marks.		
	Unit Test -1	Unit No: I, II, III
	Unit Test -2	Unit No: IV, V, VI
Term Work will consist of following Practicals		
1 Wiring accessories		
2 Verification of Kirchoff's laws		
3 Verification of Thevenin's theorem		
4 Verification of Maximum power transfer theorem		
5 Verification of correlation in phase and line values of current and voltage in 3-phase circuits		
6 To study RLC Series circuit		
7 Direct load test of single phase transformer		
8 To study wiring of different lamps controlled by different switches (Parallel wiring)		
9 To study control of two lamps from single switch (Series wiring)		
10 To study staircase wiring		
Reference Books		

1	Electrical Technology - Edward Huges (Pearson)
2	Basic Electrical Engineering - D. P. Kothari, J Nagarath (TMC)
3	Electrical power system technology - S. W. Fordo, D. R. Patric (Prentice Hall)
4	Principles of Electronics-Dr. H. M. Rai (SatyaPrakashan)
5	Electronic Devices and Circuit Theory- R. L. Boylestad and L. Nashelsky (PHI)
6	Electrical, Electronics Measurements and Instruments - (SatyaPrakashan)

COURSE: BUILDING CONSTRUCTION		
TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS:
Theory: 03 Hours / Week Practical: 02 Hours / Week	End Semester Examination:60 Marks Internal Assessment: 40Marks TW: 25 Marks	Theory: 03 TW : 01
		Total: 04
Course Pre-requisites: The students should have knowledge of		
1	Basic concepts of Engineering Drawing	
Course Objective: On completion of the course students will get knowledge -		
1	To develop the knowledge of building components, materials and construction practices	
Course Outcomes: On completion of the course, the students will be able to:		
1	Elaborate the types of structures and components of building	
2	Explain building foundation, types of masonry and Civil Engineering Materials	
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 smart materials	
Course Content:		
Unit-I	Civil Engineering and Building Components Civil Engineering scope, Civil Engineering construction process and role of Civil engineer; Government authorities related to Civil Engineering; Types of structures based on loading , material and configuration; Building components and their functions	(08 Hrs)
Unit-II	Building Foundation, Masonry and Material Building foundation, Necessity, Types, Masonry: Stone, Brick, Types of bonds in brick masonry, Composite masonry, Hollow and Solid block masonry, Mortars used in construction. Civil Engineering materials: concrete, construction steel, bricks, flooring material and tiles, paints, plywood, glass and aluminium.	(08 Hrs)
Unit-III	Doors, Windows and Staircase Doors: Classification, Terminology used, Frames, sizes. Windows: Types, Sizes. Stairs: Classification, Terminology used, Design of stairs. Lifts, Escalators,Ramps. Arches: Classification, Terminology used, Stability. Lintels: Types, Details of R.C.C. lintels and chhajja.	(08 Hrs)
Unit-IV	Floors and Roofs Flooring: I.S. Specifications, Types, Factors for selection of flooring. Roofs: Types, Suitability, Roof structures, Selection of roof covering material, Methods of water proofing of roofs, Types of trusses, Fixtures & fastenings.	(08 Hrs)
Unit-V	Building Finishes Plastering: Methods, tools used, Mortars, Defects, Plaster of Paris.Pointing: Types, Methods of pointing. Paints : Types , Textures, Apex, Plastic emulsion , Wall cladding and	(08 Hrs)

	itsMaterials.	
Unit-VI	Formwork, Scaffolding and Smart Materials Formwork : Necessity , Materials , Factors for selection , TypesScaffolding : Necessity , Materials ,Factors for selection precast concrete , Ferrocrete , Nanoconcrete , Green construction materials,	(08 Hrs)
Internal Assessment: Consist of Unit test 20 marks, Assignment 10 marks, Attendance 10 marks.		
Unit Test -1	Unit No: I, II, III	
Unit Test -2	Unit No: IV, V, VI	
Term Work		
The term-work shall consist of minimum Five drawing sheets from list below.		
1) Symbols of Material & structures		
2) Brick bonds - English bond, Flemish bond		
3) Types of stone masonry		
4) Arches - any three		
5) Types of steel trusses - any three		
6) Panelled Door & Flush doors		
7) M.S. Window, Aluminium Window, Louvers Windows		
8) Collection of information brochures related to Construction Material		
Reference 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	“ My Construction Practices ”R.B.Chaphalkar	
5	“A to Z” Building Construction” Mantri Publications	
6	“Materials of Construction” – Ghose- Tata McGraw Hill Publications	

COURSE: WORKSHOP TECHNOLOGY		
TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS:
Practical: 02 Hours / Week	TW: 25 Marks	TW : 01
		Total: 01
Course Pre-requisites: The students should have knowledge of		
1	Basic of Various tools	
Course Objective: On completion of the course students will get knowledge -		
1	Basic knowledge of using tools	
Course Outcomes: On completion of the course, the students will be able to:		
1	Understand the Measuring and Marking systems used in Carpentry Work.	
2	Understand the processes of Lap joint and Butt Joint using bolted and welded connections	
3	Understand the Techniques of Welding.	
4	Understand the Machine tools, Mechanisms and Drilling operations	
5	Get the idea about Plastic Formation and sheet metal work	
Course Content:		
	Section 1 – Carpentry(Three practicals on Carpentry One Job to Individual Student) Study of tools, operations and carpentry joints .Simple exercise using different tools like jack plane, files, measuring and marking instruments	(04 Hrs)
	Section 2 –Demo of Black Smithy(1 Practical on Black Smithy -Batch Job) Study of tools &operations, simple exercises based on smithy operations such as upsetting, bending etc	(04 Hrs)
	Section 3 – Welding Processes. (Three Practical’s on Welding & Soldering, One Job each to Individual Student) Study of various equipment’s of Gas welding, Arc welding and Soldering processes. Demonstration of Spot-Welding Machine.	(04 Hrs)
	Section 4 –Machine shop (2 Practical’s Making One Batch job on Lathe And Drilling Machine Respectively) Study of parts, operations and accessories of Lathe and Drilling Machine.	(04 Hrs)
	Section 5 – Plastic Moulding And Tin Smithy (3practical Making One Job of Plastic Mouldingor Tin Smithy in which individual Job of any one section) Brief Introduction of Plastic Molding processes and Sheet metal working.	(04 Hrs)
	for Civil Engineering Two practical’s will be performed on Plumbing section In this practical students will perform threading operation on pipe ,connections for CPV,U PVC by adhesion processes	(04 Hrs)

COURSE: : ICT FOR CIVIL ENGINEERING					
TEACHING SCHEME:		EXAMINATION SCHEME:		CREDITS:	
Practical: 02 Hours / Week		TW: 50 Marks Oral : 25		TW : 01	
				Total: 01	
Course Pre-requisites: The students should have knowledge of					
1	Basic knowledge of computer components, systems and operating of computer				
2	Basic mathematical ability				
Course Objective: On completion of the course students will get knowledge -					
1	To develop an ability to use MS- Excel and MS- Power Point and identify softwares related to CivilEngineering.				
Course Outcomes: On completion of the course, the students will be able to:					
1	Introduction to softwares related to Civil Engineering course.				
2	To solve different problems using M S- Excel				
3	To generate various graphs and charts by analyzing the given data in Excel				
4	To present different problems in various slides using M S – Power Point.				
Course Content:					
Unit-I	<u>Analysis/DesiModelling</u> Staad Pro	<u>Quantity & Estimation</u> Hit Office Auto Scan and Auto Steel QE PRO etc.	<u>Geotechnical</u> Plaxis Geo etc.	<u>GPS/GIS</u> Arc View GeoMatics etc.	(08 Hrs)
	<u>Foundation Design</u> SAFE STAAD Foundation etc.	<u>Highways</u> MX Roads HDM Auto Plotter Heads etc.	<u>Sewer Modelling</u> Kanal ++ etc. <u>Water DistributionNetwork</u> 1. Aqua ++ etc.		
Unit-II	Introduction and application of Microsoft Excel Use of computers in Civil Engineering is increasing day by day. Various analysis and design problems can be solved by preparing the programs in Microsoft Office Excel. Also, to present any problem properly, knowledge Microsoft PowerPoint is required. Use of Microsoft Office Excel and PowerPoint will make the candidate to analyze and present different problems, the details of which are as listed below: Learning Microsoft Excel: Introduction, getting started, data analysis, generate graphs.				(08 Hrs)
Unit-III	Learning Microsoft PowerPoint: Introduction , getting started,preparation of slides, preparing presentation by giving different effects				(08 Hrs)
Term Work will consist of following Practicals					
1. Identification of softwares related to Civil Engineering.					

	2. Application of various softwares in Civil Engineering courses
	3. Introduction to Microsoft Excel
	4. Preparation of Excel Sheets with various solved calculations.
	5. Graphical representation of different data.
	6. A mini project with Microsoft Excel
	7. Introduction to Microsoft PowerPoint.
	8. Preparation of slides Microsoft PowerPoint.
	9. Insertion of clipart, word-art, histograms, different shapes and various charts.
	10. A mini project with Microsoft PowerPoint
Reference Books	
1	Excel 2013 Bible” by John Walkenbach
2	Microsoft PowerPoint 2013 Introduction Quick Reference Guide” by Beezix Inc.
3	The Mr. Excel Library Series“ by Bill Jelen.
4	Exploring Microsoft PowerPoint 2016, Comprehensive, by <u>Mary Anne Poatsy</u> , <u>Rebecca Lawson</u> , <u>Cynthia Krebs</u> , <u>Robert T. Grauer</u>
5	Microsoft Office 2016 Step by Step <u>Joan Lambert</u> , <u>Curtis Frye</u>

COURSE: BUSINESS COMMUNICATION		
TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS:
Theory: 02 Hours / Week	End Semester Examination:50 Marks	Theory: 02
		Total: 02
Course Pre-requisites: The students should have knowledge of		
1	Students should have knowledge of Basic English grammar. Students should have basic information of sound system of English language. Basics of written communication	
Course Objective: On completion of the course students will get knowledge -		
The course objective of Business Communication is to help students understand the basic of English language through application of it in business. The units cover the aspects of functional grammar for inculcating the basics for business communication. It helps students to understand the process of communication in association with different components of communication. It also targets the understanding of different barriers that creep into communication process and different business documentation process.		
Course Outcomes: On completion of the course, the students will be able to:		
1	To construct the error free sentences of English language and do implementation of it in the spoken and written business communication	
2	Do applications of sounds of English language for correct pronunciation	
3	To understand communication process and principles to do applications in business communication	
4	Develop the ability to communicate effectively using suitable styles and techniques of communication	
5	Build up the ability to study employment business communication skills and its proper implications	
6	To construct effective business presentation and do effective implementation of it through activities	
Course Content:		
Unit-I	English grammar: Forms of tense, articles, preposition, use of auxiliaries and modal auxiliaries, common errors, Vocabulary development through GRAPS-PT, types of sentences voice, direct indirect speech, degree of comparison	(04 Hrs)
Unit-II	Phonetics/study of sounds in English: Introduction to phonetics, study of speech organs, study of phonetic script, transcriptions of words, articulation of different sound in English, reducing MTI, stress and intonation	(04 Hrs)
Unit-III	Communication Skills: Introduction, forms and function of communication process, non-verbal codes in communication, importance of LSRW in communication, Barriers to communication and overcoming them digital communication	(04 Hrs)
Unit-IV	Mechanics of Written Communication Developing the mechanics of written communication: principles of effective writing, technical report writing; format, structure and its types, language development through literary text	(04 Hrs)

Unit-V	Honing employment communication: Job application, building resume and CV, email writing, group discussion, interview skills, meeting formation, notice, agenda, minutes of meeting	(04 Hrs)
Unit-VI	Essential skills: Designing effective presentation, understanding theme, developing content and layout of presentation, use of tone and language, technological tools for effective presentation, developing content for extempore, elocution and public speaking	(04 Hrs)
Term Work will consist of following Practicals		
1 Wiring accessories		
2 Verification of Kirchoff's laws		
3 Verification of Thevenin's theorem		
4 Verification of Maximum power transfer theorem		
5 Verification of correlation in phase and line values of current and voltage in 3-phase circuits		
6 To study RLC Series circuit		
7 Direct load test of single phase transformer		
8 To study wiring of different lamps controlled by different switches (Parallel wiring)		
9 To study control of two lamps from single switch (Series wiring)		
10 To study staircase wiring		
Reference Books		
1	Business Communication by Meenakshi Raman, Prakash Singh published by Oxford University press, second edition,	
2	Spoken English- A manual of Speech and Phoonetics by R. K. Bansal, J. B. Harrison published by Orient Blackswan.	
3	Communication Skills by Sanjay Kumar, Pushp Lata, published by Oxford University press, second edition.	
4	Technical Communication by Meenakshi Raman, Sangeeta Sharma published by Oxford University press	
5	Developing Communication Skills by Krishna Mohan, Meera Banerji published by Macmillan India Pvt Ltd.	

COURSE: ENGINEERING MATHEMATICS -II		
TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS:
Theory: 03 Hours / Week Tutorial: 01 Hours / Week	End Semester Examination:60 Marks Internal Assessment: 40 Marks	Theory: 04
		Total: 04
Course Pre-requisites: The students should have knowledge of		
1	Student should have Basic Knowledge of differential calculus	
Course Objective: On completion of the course -		
This course help student to develop an ability for differential equations to model the complex physical systems.		
Course Outcomes: On completion of the course, the students will be able to:		
1	To solve differential equations by different methods	
2	Apply different laws to solve Simple Harmonic Motion, One– Dimensional Conduction of Heat, Chemical engineering problems.	
3	To solve integral calculus and Fourier series	
4	To solve integral calculus with error functions	
5	Determine position in solid geometry	
6	Solve multiple integration problems	
Course Content:		
Unit-I	Differential Equation Definition, Order and Degree of DE, Formation of DE. Partial Differential Equations, Classification of higher order PDEs. Solutions of Variable Separable DE, Exact DE, Linear DE and reducible to these types.	(08 Hrs)
Unit-II	Applications of Differential Equations Applications of DE to Orthogonal Trajectories, Newton's Law of Cooling, Kirchoff's Law of Electrical Circuits, Motion under Gravity, Rectilinear Motion, Simple Harmonic Motion, One–Dimensional Conduction of Heat, Chemical engineering problems. Solution of Higher order ODE with constant and variable coefficients and its applications to boundary and initial value problems.	(08 Hrs)
Unit-III	Fourier Series and Integral Calculus Definition, Dirichlet's conditions, Fourier Series and Half Range Fourier Series, Harmonic Analysis. duction formulae, Beta and Gamma functions	(08 Hrs)
Unit-IV	Integral Calculus and Curve Tracing Differentiation Under the Integral Sign, Error functions. Tracing of Curves, Cartesian, Pola and Parametric Curves. 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 Application Double and Triple integrations, Applications to Area, Volume, Mean and Root Mean Square Values	(08 Hrs)

Internal Assessment: Consist of Unit test 20 marks, Assignment 10 marks, Attendance 10 marks.	
Unit Test -1	Unit No: I, II, III
Unit Test -2	Unit No: IV, V, VI
Reference Books:	
1	Applied Mathematics (Volumes I and II) by P. N. Wartikar & J. N. Wartikar (Pune Vidyarthi Griha Prakashan, Pune), 7th Edition, 1988, Reprint 2010.
2	Higher Engineering Mathematics by B. S. Grewal (Khanna Publication, Delhi), 42th Edition, 2012.
3	Higher Engineering Mathematics by B.V. Ramana (Tata McGraw-Hill), Edition, 2008.
4	Advanced Engineering Mathematics by Erwin Kreyszig (Wiley Eastern Ltd.), 8th Edition, 1999, Reprint 2010.
5	Advanced Engineering Mathematics, 7e, by Peter V. O'Neil (Thomson Learning), Edition 2007.
	Advanced Engineering Mathematics, 2e, by M. D. Greenberg (Pearson Education), 2nd Edition, 2002.

COURSE: ENGINEERING CHEMISTRY		
TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS:
Theory: 03 Hours / Week Practical: 02 Hours / Week	End Semester Examination: 60 Marks Internal Assessment: 40 Marks Term Work : 25 Marks	Theory: 03 Term Work : 01
		Total: 04
Course Pre-requisites: The students should have knowledge of		
1	Student should have Basic Knowledge of Chemistry	
Course Objective: On completion of the course -		
1. . To understand technology involved in analysis and improving quality of water as commodity. 2. To acquire the knowledge of electro-analytical techniques that facilitates rapid and precise understanding of materials. 3. To understand structure, properties and applications of specialty polymers and nano material. 4. To study conventional and alternative fuels with respect to their properties and applications. 5. To study spectroscopic techniques for chemical analysis. To understand corrosion mechanisms and preventive methods for corrosion control		
Course Outcomes: On completion of the course, the students will be able to:		
1	Select appropriate method of crystal analysis.	
2	Illustrate the knowledge of polymers, fabrication methods, conducting polymers in industrial fields	
3	Illustrate the knowledge of engineering materials for various engineering applications	
4	Analyze fuel with calorific value and apply combustion methods for use of alternative fuels	
5	Explain corrosion and methods for prevention of corrosion.	
6	Apply the different methodologies for analysis of water and suggest suitable methods of treatment.	
Course Content:		
Unit-I	Water Technology Impurities in water. Hardness of water and its determination by EDTA method, Alkalinity of water and its determination. Numerical. III effects of hard water in boiler. Boiler feed water treatment 1) Internal treatment - calgon, colloidal and phosphate conditioning, 2) External treatment A) Zeolite process and its numerical (B) Ion exchanger method. Desalination of brackish water/purification of water by reverse osmosis and electrodialysis.	(06 Hrs)
Unit-II	Instrumental Methods of Analysis Introduction: Types of reference electrode (calomel electrode), indicator electrode (glass electrode), ion selective electrode: ion selective membranes such as solid membrane, enzyme based membrane and gas sensing membrane. Conductometry: Introduction, conductivity cell, conductometric titrations of acid versus base with titration curve. pHmetry: Introduction, standardization of pH meter, pH metric titration of strong acid versus strong base with titration curve	(06 Hrs)
Unit-III	Electrochemistry	(06 Hrs)

	<p>Introduction, Arrhenius Ionic theory, Kohlrausch's law of independent migration of ions</p> <p>Laws of electrolysis: Faradays Laws, Ostwald's dilution law, Acids and Bases, concept of pH and pOH, Buffer solutions, Solubility Product, Redox Reactions.</p> <p>Electrode Potential, electrochemical cell, concentration cell, reference Electrodes, Overvoltage, Conductometric Titrations, Fuel cells, Lead Acid Storage Cell and numericals based on the above articles.</p>	
Unit-IV	<p>Material Chemistry</p> <p>Crystallography: Unit cell, Law of crystallography, Weiss indices and Miller indices, Crystal defects(point and line defects), X-ray diffraction-Bragg's Law and numerical, Indexing of planes and directions, Imperfections in crystals, Density calculations, Volume density, Linear density, Atomic packing factor single crystal structure.</p> <p>Cement : Introduction of cement, Hydraulic/ Non-hydraulic cementing materials, classification of cement, chemistry of portland cement, chemical composition and compound constituents of portland cement, properties of cement and its</p>	(06 Hrs)
Unit-V	<p>Study of Polymers, Composite</p> <p>A) Polymers: Introduction, plastics, thermo softening and thermosetting plastics, industrially important plastics like phenol formaldehyde, urea formaldehyde and epoxy resins, Conducting polymers and Biopolymers (Introduction, examples and applications.) B)Composite: Introduction, Classification, constituents of composites, Fiber reinforced composites, unidirectional fiber reinforced composites, short fiber reinforced composites, particle reinforced composites, important types and failures of fiber reinforced.</p>	(06 Hrs)
Unit-VI	<p>Corrosion and Prevention</p> <p>Introduction, Types of corrosion, Oxide film growth laws, Action of hydrogen, Polarization, Stress corrosion, Season Cracking, Prevention of corrosion, Design of component, Modification of environment, Cathodic Protection, Deposition and coating, Ion Implantation, PVD, CVD, Powder coating etc.</p>	(06 Hrs)
Internal Assessment: Consist of Unit test 20 marks, Assignment 10 marks, Attendance 10 marks.		
	Unit Test -1	Unit No: I, II, III
	Unit Test -2	Unit No: IV, V, VI
TW will consist of Any Eight Experiments of the Following		
<ol style="list-style-type: none"> To determine hardness of water by EDTA method To determine strength of strong acid using pH meter Titration of a mixture of weak acid and strong acid with strong base using conductometer Preparation of polystyrene/phenol-formaldehyde/urea-formaldehyde resin To determine molecular weight/radius of macromolecule polystyrene/ polyvinyl alcohol by viscosity measurement. 		

6. Preparation of biodiesel from oil.
7. Determination of Saponification value of an oil sample.
8. Estimation of percentage of Iron in Plain Carbon Steel by Volumetric Method
9. To determine Surface Tension of given liquid by Stalagmometer
10. Study of corrosion of metals in medium of different pH.
11. To set up Daniel cell
12. To determine pH of soil
13. To determine Acidity of soil
14. Study of Bomb calorimeter for determination of calorific value.
15. Determination of calorific value of gas fuel by using Boy's gas calorimeter.
16. Determination of percentage of Ca in given cement sample

Reference Books:

1	Jain P.C & Jain Monica, Engineering Chemistry, Dhanpat Rai & Sons, Delhi, 1992.
2	Bhal & Tuli, Text book of Physical Chemistry (1995), S. Chand & Company, New Delhi.
3	O. G. Palanna , Engineering Chemistry, Tata McGraw-Hill Publication, New Delhi
4	S. S. Dara, A textbook of Engineering Chemistry, McGraw-Hill Publication, New Delhi.
5	Barrow G.M., Physical Chemistry, McGraw-Hill Publication, New Delhi.

COURSE: SURVEYING		
TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS:
Theory: 03 Hours / Week Practical: 04Hours / Week	End Semester Examination:60 Marks Internal Assessment: 40 Marks Term work : 25 Marks Practical : 25 Marks	Theory: 03 Practical: 02
		Total: 05
Course Pre-requisites: The students should have knowledge of		
1	Basic Mathematics and geometry	
Course Objective: On completion of the course -		
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 explainuse of modern instruments.	
Course Content:		
Unit-I	Linear measurements and Compass survey 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	(06 Hrs)
Unit-II	Vertical measurements 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	(06 Hrs)
Unit-III	Theodolite Survey 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.	(06 Hrs)
Unit-IV	Tacheometry and Plane Table Survey 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,	(06 Hrs)

	intersection, traversing and resection, errors and precision of plane table survey.	
Unit-V	Curves Necessity of providing curves, simple circular curves, elements, setting out circular curves by radial and perpendicular offsets, offsets from longchord and offsets from chords produced. Angular method of deflection angles. Transition curves, necessity and types.	(06 Hrs)
Unit-VI	Construction Survey and modern equipment's 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 topo sheets.	(06 Hrs)

Internal Assessment: Consist of Unit test 20 marks, Assignment 10 marks, Attendance 10 marks.

Unit Test -1	Unit No: I, II, III
Unit Test -2	Unit No: IV, V, VI

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 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

Reference 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.
7	Surveying: Theory and practice-James M. Anderson, Edward M. Mikhail
8	Surveying theory and practices-Devise R. E., Foot F.S.
9	Plane and Geodetic Surveying for Engineers. Vol. I -David clark.
10	Principles of Surveying. Vol. I - J.G.Olliver, J.Clendinning
11	Surveying Vol. I & II -S.K.Duggal, Tata Mc-Graw Hill.
12	Surveying and Levelling - Subramanian, oxford University Press.

COURSE: ENGINEERING MECHANICS		
TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS:
Theory: 03 Hours / Week Practical: 02Hours / Week	End Semester Examination:60 Marks Internal Assessment: 40 Marks Term work : 25 Marks	Theory: 03 TW: 01
		Total: 04
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: On completion of the course -		
The student should be able to determine effect of forces and concept of equilibrium on rigid object to solve engineering problems.		
Course Outcomes: On completion of the course, the students 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 on rigid body.	
6	evaluate kinetic effect of forces on rigid body.	
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.	(06 Hrs)
Unit-II	Friction Coefficient of Static Friction, Impending motion of Blocks, Ladders and Belts.	(06 Hrs)
Unit-III	Analysis of Truss Analysis of Perfect Trusses - Method of Joint, Method of Section	(06 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.	(06 Hrs)
Unit-V	Kinematics of a Particle Cartesian components, Normal and Tangential components of motion, Relative motion, Dependent motion, Motion of a Projectile,	(06 Hrs)
Unit-VI	Kinetics of a Particle D’Alemberts Principle, Work-Energy Principle and Impulse-Momentum Principle, Coefficient of Restitution, Direct Central Impact.	(06 Hrs)
Internal Assessment: Consist of Unit test 20 marks, Assignment 10 marks, Attendance 10 marks.		
	Unit Test -1	Unit No: I, II, III
	Unit Test -2	Unit No: IV, V, VI

Assignments: Students should perform theoretical / experimental assignment/s from the list below	
1) Calculate Resultant of given force system.	
2) Determination of reactions or force in equilibrium force system	
3) Determination of friction force	
4) Determination of friction force in in belt.	
5) Calculate forces in members of truss using method of joint.	
6) Calculate forces in members of truss using method of section.	
7) Determination of Centroid of line elements.	
8) Determination of Centroid of plane elements	
9) Calculate moment of Inertia of plane elements	
10) Calculate Normal and Tangential components of motion	
11) Calculate relative velocity of bodies.	
12) Determine Motion of a Projectile.	
13) Apply D'Alemberts Principle for given problem.	
14) Apply Work-Energy Principle for given problem.	
15) Apply Impulse-Momentum Principle for given problem.	
16) Calculate motion of bodies after Impact.	
Term Work:	
The term-work shall consist of minimum Five experiments from list below.	
Part A	
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 The term-work shall also consist of minimum Five graphical solutions of the problems on different topics.	
Reference Books:	
1	“Engineering Mechanics” (Statics and Dynamics),Hibbeler R.C., McMillan Publication
2	“Vector Mechanics for Engineers-Vol.-I and Vol.-II (Statics and Dynamics)”, Beer F.P. and Johnston E.R., Tata McGraw Hill Publication.
3	“Engineering Mechanics”,Bhavikatti S.S. and Rajashekarappa K.G., New Age International (P) Ltd.
4	“Engineering Mechanics (Statics and Dynamics)”,Tayal A.K., Umesh Publication
5	“Engineering Mechanics-I and II (Statics and Dynamics)”, Mokashi V.S., Tata McGraw Hill Publication
6	“Engineering Mechanics (Statics and Dynamics)”, Shames I.H., Prentice Hall of India (P) Ltd.
7	“Engineering Mechanics (Statics and Dynamics)”, Singer F.L., Harper and Row Publication
8	Engineering Mechanics (Statics and Dynamics),Meriam J.L. and Kraige L.G., John Wiley and Sons Publication
9	“Engineering Mechanics (Statics and Dynamics)”,Timoshenko S.P. and Young D.H., McGraw Hill Publication

COURSE: BUILDING PLANNING AND DESIGN		
TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS:
Theory: 03 Hours / Week Practical: 02Hours / Week Tutorial: 1 Hour / Week	End Semester Examination:60 Marks Internal Assessment: 40 Marks Term work : 25 Marks Oral : 25 Marks	Theory: 04 TW: 01
		Total: 05
Course Pre-requisites: The students should have knowledge of		
1	Building Construction, Building materials, Knowledge of Engineering Graphics	
2		
Course Objective: On completion of the course -		
. To make the student illustrate the process of building planning and building byelaws		
Course Outcomes: On completion of the course, the students 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	develop the detail drawings of various types of buildings.	
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, 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 Hrs)
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 Hrs)
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, Airconditioning systems. Effect of noise, Noise control sound insulation, Acoustics reverberation Sabine"sformula, acoustical defects, conditions of good acoustics.	(06 Hrs)
Unit-IV	Building Services Constructional requirements for different building services like Electrical, Telecommunication services, Circulation-Lift Types and	(06 Hrs)

	Capacity, escalators, Entertainment services. Fire Protection – Fire safety, fire load, grading of occupancies by fire load, fire escape elements. Solar Panel – Necessity, design.	
Unit-V	Plumbing Services Plumbing services, fixtures and fastenings, Layout of water supply & drainage system, Rate of water supply, storage and distribution arrangement, Plumbing systems.	(06 Hrs)
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 Hrs)
Internal Assessment: Consist of Unit test 20 marks, Assignment 10 marks, Attendance 10 marks.		
	Unit Test -1	Unit No: I, II, III
	Unit Test -2	Unit No: IV, V, VI
Assignments: Students should perform theoretical / experimental assignment/s from the list below		
7. Types of structures and building components		
8. Building foundations and civil engineering construction materials		
9. Various components of building		
10. Floors and roofs		
11. Building finishes		
12. Formwork, scaffolding and smart materials		
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		
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.		
Reference 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
4	IS provisions "National Building Code"
5	"Development Control Rules" of local plan sanctioning authority
6	Calendar, "Time Saver Standards for Architectural Design", Tata McGraw Hill Publishers
7	Merit, "Building Design and Construction", Tata McGraw Hill Publishers

COURSE: CIVIL ENGINEERING SOFTWARE – I		
TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS:
Practical: 02Hours / Week	Term work : 50 Marks	TW: 01
		Total: 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 Objective: On completion of the course -		
To make student capable of drawing any kind of Engineering drawing using AutoCAD		
Course Outcomes: On completion of the course, the students 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.	(08 Hrs)
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.bungalow plans, Elevation and Section.	(08 Hrs)
Unit-III	3D Drawing: 1 BHK Bungalow plans, 3D Truss, 3D Industrial shed, Steel drawing for bungalow	(08 Hrs)
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.		
Reference 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”		
“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”		

COURSE: SOFT SKILLS		
TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS:
Theory: 02Hours / Week	End Semester Exam : 50 Marks	Theory: 02
		Total: 02
Course Pre-requisites: The students should have knowledge of		
1	Students should have knowledge of basic soft skills Students should have basic information of self analysis techniquesBasics of business manners	
Course Objective: On completion of the course -		
The course objective of Soft skills puts the following class teaching objectives, considering soft skills as a wheel rolling aspects in today's world, the focus is on honing the skills self awareness and self development. It also puts emphasis on developing the interpersonal skills. Honing the skills of time management and stress management among students through appropriate activities, this will help them in their business ventures. It also aims to develop the skills of conflict resolution, problem solving and inclusion ability at work place.		
Course Outcomes: On completion of the course, the students will be able to:		
1	To understand the concept of soft skills and its implicationat workplace	
2	To analyze SWOT and TOWS techniques and its implementation in career development	
3	To develop team building and leadership skills by applyingmotivational factors	
4	To build up the time management mastery through ParetoPrinciples and time matrix	
5	To inculcate appropriate business ethics and etiquettes foreffective professionalism	
6	To apply the negotiation, conflict resolution and problemsolving skills at workplace	
Course Content:		
Unit-I	Introduction: Soft skills, meaning, need and importance, difference between soft skills and hard skills, life skills and personal skills, applying soft skills across culture	(04 Hrs)
Unit-II	Self awareness and self development Self assessment, self appraisal through SWOT and TOWS, developing perception and attitude, personal goal setting and selfmanagement, Career planning and personal success factors	(04 Hrs)
Unit-III	Developing interpersonal skills: Conversation, building team, team dynamics, developing leadership skills, difference between leader and manager, role and responsibilities of leader, different styles of leadership, Maslow's theory of motivation	(04 Hrs)
Unit-IV	Time management: Time management matrix, apply Pareto principle (80/20) to the time management, handle the most common time wasters, maximizingpersonal effectiveness	(04 Hrs)
Unit-V	Business ethics and corporate etiquettes Ethics- its definition, importance and code of ethics, workplace etiquettes and professionalism, communication etiquettes, telephonic etiquettes, meeting etiquettes	(04 Hrs)
Unit-VI	Problem solving, Diversity and inclusion Conflict resolution, negotiation and problem solving, handling different problems at workplace, Diversity and inclusion at workplace,	(04 Hrs)

	LGBTQ+, its advantages and disadvantages	
Reference Books:		
01. Soft Skills by Meenkashi Raman, published by Cengage publishers		
02. Soft skills for Managers by Dr. T. Kalyana Chakravarthi and Dr. T. Latha Chakravarthi published by biztantra		
03. Personality development and Soft Skills by Barun K. Mitra by Oxford University press		
04. Soft Skills by Dr. K Alex published by Oxford University press		
05. The Ace of Soft Skills: Attitude, Communication and Etiquettes for Success by Ramesh Gopalswamy, published by pearsoneducation		
06. Seven Habits of Highly effective People: Powerful lessons in personal life by Stephen Covey		