B. Tech. (Biomedical) – 2014 Course

Semester- I										**Contact Hours: 30 Hrs/week** **Total Credits: 25** **Total Marks: 700**	
Sr. no.	Subject	Teaching Scheme(Hrs)			Examination Scheme (Marks)					Total Marks	Total Credits
		L	T	P	End Semester Exam	Continuous Assessment			TW		
						Unit test	Tutorials / Assignments	Attendance			
1	Engineering Mathematics-I	3	1	0	60	20	10	10	-	100	4
2	Fundamentals of Civil Engineering	3	0	2	60	20	10	10	25	125	4
3	Engineering Graphics	4	0	2	60	20	10	10	25	125	5
4	Engineering Chemistry	4	0	2	60	20	10	10	25	125	5
5	Elements of Electronics Engineering	3	0	2	60	20	10	10	25	125	4
6	Professional Skill Development-I	2	0	0	30	0	20	0	0	50	2
7	Workshop Technology	0	0	2	0	0	0	0	50	50	1
	Total	**19**	**01**	**10**	**330**	**100**	**70**	**50**	**150**	**700**	**25**

Note:

1. **Sem-I & Sem-II are common to the branches (Electronics, Biomedical & E & T/C)**
2. *** indicates subjects common to the branches (Electronics, Biomedical & E & T/C)**
3. **** indicates subjects common to the branches (Electronics & E & T/C)**
4. **Engineering Mathematics –I, II, III are common to the branches (Electronics, Biomedical & E & T/C)**
5. **Internal assessment of 40 marks comprises of 20 marks average of two Unit tests,10 marks tutorials/assignments and 10 marks attendance**

B. Tech. (Biomedical) – 2014 Course

Semester- II **Contact Hours: 30 Hrs/week**
Total Credits: 25
Total Marks: 700

Subject Code	Subject	Teaching Scheme(Hrs)			Examination Scheme (Marks)					Total Marks	Total Credits
						Continuous Assessment					
		L	T	P	End Semester Exam	Unit test	Tutorials / Assignments	Attendance	TW		
8	Engineering Mathematics -II	3	1	0	60	20	10	10	-	100	4
9	Fundamentals of Mechanical Engineering	3	0	2	60	20	10	10	25	125	4
10	Fundamentals of Engineering Mechanics	4	0	2	60	20	10	10	25	125	5
11	Engineering Physics	4	0	2	60	20	10	10	25	125	5
12	Fundamentals of Electrical Engineering	3	0	2	60	20	10	10	25	125	4
13	Professional Skill Development-II	2	0	0	30	0	20	0	0	50	2
14	Fundamentals of Computing	0	0	2	0	0	0	0	50	50	1
	Total	**19**	**01**	**10**	**330**	**100**	**70**	**50**	**150**	**700**	**25**

ENGINEERING MATHEMATICS-I

Teaching Scheme:	Examination scheme:	Credits Allotted:
Lectures: 3Hrs/Week	Semester Examination: 60 marks	Theory : 03
Tutorials: 1Hr/Week	Continuous Assessment: 40 marks	Tutorial : 01

Unit I

MATRICES

Rank, Normal form, System of Linear Equations, Linear Dependence and Independence, Linear and Orthogonal Transformations. Eigen values, Eigen Vectors, Cayley – Hamilton Theorem.Application to problems in Engineering .

(08 Hours)

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 Hours)

Unit III

DIFFERENTIAL CALCULUS

Successive Differentiation, nth Derivatives of Standard Functions,Leibnitz's Theorem.

EXPANSION OF FUNCTIONS

Taylor's Series and Maclaurin's Series.

(08 Hours)

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 Hours)**

Unit V

PARTIAL DIFFERENTIATION AND APPLICATIONS

Partial Derivatives, Euler's Theorem on Homogeneous Functions, Implicit functions, Total Derivatives, Change of Independent Variables. Errors and Approximations.

(08 Hours)

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 Hours)

Assignments

1. Rank ,System of Linear Equations.
2. Complex Numbers.
3. Differential Calculus and Expansion of Functions.
4. Indeterminate Forms and Infinite Series.
5. Partial Derivatives, Euler's Theorem on Homogeneous Functions.
6. Jacobians, Maxima and Minima of Functions of two variables.

References / Text Books :

1. Applied Mathematics (Volumes I and II) by P. N. Wartikar& J. N. Wartikar, Pune VidyarthiGrihaPrakashan, Pune, 7th edition (1988).
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 (2008) .
4. Advanced Engineering Mathematics by Erwin Kreyszig, Wiley Eastern Ltd, 8thedition(1999).
5. Advanced Engineering Mathematics, 7e, by Peter V. O'Neil, Thomson Learning,6th edition (2007).
6. Advanced Engineering Mathematics, 2e, by M. D. Greenberg, Pearson Education, 2nd edition(2002).

Syllabus for Unit Test:

Unit Test I :- Unit I,II,III
Unit Test II :- Unit IV,V,VI

02: Fundamentals of Civil Engineering

TEACHING SCHEME:	**EXAMINATION SCHEME:**	**CREDITS ALLOTTED:**
Theory: 03 Hours / Week	End Semester Examination: 60 Marks	03 Credits
Practical: 02 Hours / Week	Continuous Assessment: 40 Marks	
	Term Work: 25 Marks	01 Credit

Course Pre-requisites:	
The Students should have	
1.	Concepts of units and conversions of units.
2.	Basic knowledge of Chemistry
3.	Basic knowledge of geography, concept of latitude and longitude.
Course Objectives:	
	To make student understand the scope and application of Civil Engineering
Course Outcomes:	
Students will be able to understand	
1.	Different building components and material
2.	Classification of surveying
3.	Levellingof the ground
4.	Planning of building
5.	Methods of irrigation and water supply
6.	Different methods of transportation

UNIT - I	**Civil Engineering Scope And Applications.**	**(06 Hours)**
	Civil Engineering scope, importance and applications to other disciplines of Engineering; 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; Civil Engineering materials: concrete, construction steel, bricks, flooring material and tiles, paints, plywood , glass and aluminum.	
UNIT - II	**Surveying**	**(06 Hours)**
	Objectives, Principles and Classification of Surveying; Linear, angular, Vertical and area Measurements and related instruments.	
UNIT - III	**Building Planning And Bye Laws**	**(06 Hours)**
	Site selection for residential building; Principles of building planning; Building bye laws- necessity, Floor Space Index, Heights , open space requirements, set back distance , ventilation and lighting, concept of carpet and built up area, minimum areas and sizes for residential buildings ; Concept of Eco friendly structures and Intelligent buildings.	
UNIT - IV	**Foundations and Earthquakes**	**(06 Hours)**
	Function of foundation, concept of bearing capacity and its estimation, types of foundation and its suitability, causes of failure of foundation. Earthquakes causes, effects and guidelines for earthquake resistant design, earthquake zones.	

UNIT - V	**Irrigation And Water Supply**	**(06 Hours)**
	Rainfall measurement and its use in design of dams; Types of dams, canals, methods of irrigation and their merits and demerits; hydropower structures ;Water supply, drinking water requirements and its quality, water and sewage treatment flow chart.	
UNIT - VI	**Infrastructure**	**(06 Hours)**
	Roads- types of roads and their suitability, cross section of roads, meaning of terms ; width of roads, super elevation, camber, gradient ,sight distance, materials used for construction of roads. Railways- Types of gauges, section of railway track, components of railway track, advantages. Bridges: Components - Foundation, Piers, Bearings, Deck. Airways- Components -Runway, Taxiway and Hangers.	

Term Work:	
(Term work shall consist of any eight exercises from the list given below.)	
1.	Study and use of prismatic compass and measurement of bearings.
2.	Study and use of Dumpy level and reduction of levels by collimation plane method.
3.	Area measurement by Digital Planimeter.
4.	Drawing plan and elevation of a residential bungalow.
5.	Study of features of topographical maps.
6.	Assignment on collection of information on Civil Engineering materials.
7.	Assignment on types of foundations.
8.	Assignment problem on irrigation and hydropower structures.
9.	Assignment on study of flow chart of water and sewage treatment.
10.	Assignments on types of transportation systems.

Text Books:	
1.	" Surveying- Vol I " - S.K. Duggal , Tata McGraw Hill Publication.
2.	"Built Environment" – Shah , Kale, Patki, , Tata McGraw Hill Publication
3.	"Building Construction" – Dr. B.C. Punmia , Laxmi Publication
4.	"Irrigation and water Power Engineering "- Dr. P.N. Modi,Standard Publishers ,New Delhi
5.	"Text book of Transportation Engineering "- Arora, Charotar Publishers.
6.	Water supply and sanitary engineering-Rangawala, Charotar Publishers.
7.	"Basic Civil engineering"- M.S. Palanichamy- Tata McGraw Hill Publication
Reference Books:	
1.	"Surveying –Theory and Practice"-James Anderson- Tata McGraw Hill Publication

Syllabus for Unit Test:	
Unit Test -1	Unit I to III
Unit Test -2	Unit IV to VI

ENGINEERING GRAPHICS

Teaching Scheme:	Examination Scheme:	Credits Allotted
Theory: -04 Hours / Week	End Semester Examination: -60Marks	05
Practical: 02 Hours / Week	Continuous Assessment: -40Marks	
	Term Work: 25 Marks	

Unit I	**Lines and Dimensioning in Engineering Drawing** Different types of lines used in drawing practice, Dimensioning – linear, angular, aligned system, unidirectional system, parallel dimensioning, chain dimensioning, location dimension and size dimension. **Curves used in Engineering Practice** Ellipse by Directrix-Focus method, Arcs of Circle method, Concentric circle method and Oblong method. Involute of a circle, Cycloid, Archimedean Spiral, Helix on cone, Loci of points- Slider Crank mechanisms.	(6)
Unit II	**Orthographic Projection** 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.	(6)
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 of a Pyramid, Cone, and Sphere.	(6)
Unit IV	**Projections of Points and 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	(6)
Unit V	**Projection of Solids** Projection of prism, pyramid, cone and cylinder by rotation method.	(6)
Unit VI	**Section of Solids** Types of section planes, projections of solids cut by different sections of prism, pyramid, cone and cylinder.	(6)

Term work

Term work shall consist of five half-imperial size or A2 size (594 mm x 420 mm) sheets. Assignment 05 Problems on each unit in A3 size Drawing Book

SHEETS

1. Types of lines, Dimensioning practice, Free hand lettering, 1nd and 3rd angle methods symbol.
2. Curves and loci of points
3. Projections of Points and Lines and planes

4. Orthographic Projections
5. Isometric views
6. Projection of Solids

Text Books

1. “Elementary Engineering Drawing”, N.D. Bhatt, Charotar Publishing house, Anand India,
2. “Text Book on Engineering Drawing”, K.L.Narayana & P.Kannaiah, 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
6. P. S. Gill, "Engineering Drawing (Geometrical Drawing)", 10 Edition, S. K. Kataria and Sons, 2005
7. P. J. Shah, "Engineering Drawing", C. Jamnadas and Co., 1 Edition, 1988

ENGINEERING CHEMISTRY

Teaching Scheme:	Examination scheme:	Credits Allotted:
Lectures: 4Hrs/Week	End Semester Examination: 60 marks	Theory: 04
Practical: 2Hr/Week	Continuous Assessment: 40 marks	Practical: 01
		Term Work: 25marks

Unit I

WATER

Introduction, Hardness of water, Effect of hard water on boilers and heat exchangers: a) boiler corrosion b) caustic embrittlement c) scales and sludges d) priming and foaming

Water softening methods for industrial purposes :a) Zeolite process b) Phosphate conditioning Numerical based on the zeolite process

(08 Hours)

Unit II

MATERIAL CHEMISTRY

Crystallography : Unit cell, Laws of crystallography, Weiss indices and Miller indices, Crystal defects (point and line defects), X-ray diffraction – Bragg's Law and numerical.

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 applications.

(08 Hours)

Unit III

FUELS

Introduction, classification of fuels, calorific value of fuels, NCV and GCV, Determination of calorific values using Bomb calorimeter and Boys' gas calorimeter.

Theoretical calculation of calorific value of a fuel, Analysis of coal a) Proximate b) Ultimate analysis of coal, Numericals based on NCV, GCV.

(08 Hours)

Unit IV

CORROSION AND ITS PREVENTION

Corrosion: - Definition, atmospheric corrosion-mechanism, Wet corrosion-mechanism, Electrochemical and galvanic series, Factors affecting corrosion-nature of metal, nature of environment.

Methods of prevention of corrosion- Cathodic and Anodic protection, Metallic coatings, Electroplating, Hot dipping.

(08 Hours)

Unit V

ELECTROCHEMISTRY

Introduction, Arrhenius Ionic theory, Kohlrausch's law of independent migration of ions

Laws of electrolysis: Faradays Laws, Ostwald's dilution law, Acids and Bases, concept of pH and pOH, Buffer solutions, Solubility Product, Redox Reactions.

Electrode Potential, electrochemical cell, concentration cell, reference Electrodes, Overvoltage, Conductometric Titrations, Fuel cells, Lead Acid Storage Cell and numericals based on the above articles.

(08 Hours)

Unit VI

STEREOCHEMISTRY

Introduction, chirality, optical activity, Enantiomers, Diastereomers, projection formula of tetrahedral carbon- Newman projection, Wedge projection, Fischer projection, Geometrical isomerism :- cis and trans isomerism, E and Z isomers

Optical isomerism :- Mesoform, the number of optical isomers for chiral molecules,

Conformations :- conformations of ethane, conformations of n-butane

(08 Hours)

TERM WORK

Experiments

Any Ten experiments from the following:

1. Estimation of hardness of water by EDTA method.
2. Estimation of chlorine by Mohr's method.
3. Determination of percentage of Ca in given cement sample
4. Determination of coefficient of viscosity by Ostwald's viscometer
5. Study of Bomb calorimeter for determination of calorific value.
6. Determination of calorific value of gas fuel by using Boy's gas calorimeter.
7. Determination of dissolved oxygen in a water sample.
8. To determine the Molecular Weight of polymer
9. Estimation of Copper from brass sample solution by Iodometrically
10. Estimation of percentage of Iron in Plain Carbon Steel by Volumetric Method
11. To standardize NaOH solution and hence find out the strength of given hydrochloric Acid solution
12. To determine Surface Tension of given liquid by Stalagmometer
13. Study of corrosion of metals in medium of different pH.
14. To set up Daniel cell
15. To determine pH of soil
16. To determine Acidity of soil

Assignments

7. Effect of hard water on boilers and heat exchangers
8. Hydraulic/ Non-hydraulic cementing materials
9. Analysis of coal a) Proximate b) ultimate analysis of coal
10. Wet corrosion-mechanism, Electroplating, Hot dipping
11. Geometrical isomerism :- cis and trans isomerism, E and Z isomers
12. Fuel cells

References / Text Books :

7. Engineering Chemistry by Jain and Jain, Dhanpat Rai Company (P) Ltd, New Delhi
8. Chemistry of Engineering Materials, Agarwal C.V, Rata Publication Varanasi, 6th edition (1979)
9. Chemistry in Engineering and Technology, Volume W, Tata McGraw Hill Publishing Company Ltd, New Delhi (1988)
10. Applied Chemistry, O. P. Vidyankar, J. Publications, Madurai, (1955)
11. Engineering Chemistry, S. N. Chand and Co., Jalandhar, 31st Edition (1990)
12. Engineering Chemistry by Dara S. S. S Chand Publications
13. Fundamentals of Electrochemistry, V. S. Bagotsky (Ed) Wiley NY (2006)

Syllabus for Unit Test:

Unit Test I :- Unit I,II,III

Unit Test II :- Unit IV,V,VI

Course: ELEMENTS OF ELECTRONICS ENGINEERING

TEACHING SCHEME	EXAMINATION SCHEME		CREDITS
Lectures : 03 Hrs/week	End semester exam	: 60 Marks	03
Practicals : 02 Hrs/week	Continuous Assessment	: 40 Marks	
	Term work	: 25 Marks	01

Course Prerequisite:

Students have completed a course in Physics and have the knowledge of laws of Dynamics

Course Objective:

This course will introduce the concepts of electronic engineering . By the end of the course, student will be familiar with electronic components, semiconductor devices and their applications. The course emphasizes on Electronic devices, ICs and Digital systems.

Course Outcomes:

At the end of the course, a student will be able to

1 understand the basic semiconductor physics and semiconductor devices.
2 understand transport phenomenon of semiconductor devices through energy band diagrams.
3. to identify electronic components like, resistors, capacitors, inductors and to study characteristics of semiconductor devices.
4. apply the knowledge of diodes to the rectifier and filter circuits.
5. to represent numerical values in various number systems and perform number conversions between different number system and study applications of logic gates.

Unit-I **(08 Hours)**

Electron Dynamics:

Motion of electron in electric, magnetic and combined electric and magnetic fields. Detection and focusing system of Oscilloscope tube-Television picture tube- LCD and Flat panel displays.

Unit-II **(08 Hours)**

Transport phenomenon in semiconductor:

Mobility and conductivity - Drift and Diffusion currents – Continuity Equation – Minority carrier injection and recombination in Homogeneous semiconductor – Thermistors – Peizo Resistors – Hall Effect – Thermoelectric effect

Unit-III **(08 Hours)**

Electronic components:

Resistors -Inductors and Capacitors and their types – Construction and characteristics of PN junction diode – Zener Diode – Tunnel diode - Bipolar junction transistors – CB,CC,CE circuits**,** Field Effect transistors **.**

Unit-IV **(08 Hours)**

Electronic Devices and Linear ICs:

Rectifiers: Half wave, Full wave and Bridge rectifiers - capacitor filter-wave forms-ripple factor regulation characteristics. Special semiconductor devices: FET - SCR - LED - VI characteristics – applications. Introduction to Op-Amp and Timers.

Unit-V **(08 Hours)**

Digital system:

Number system: Binary system, Decimal to Binary, Octal system, Hexadecimal system, binary –addition, subtraction, multiplication and division.

Logic gates: OR, AND, NOT, Exclusive-OR, NOR, NAND gates, Logic networks, Gate Standardization, Introduction to Logic Circuits –Combinational and Sequential Circuits.

(08 Hours)

Unit-VI

Consumer Electronics:

Basic study of various products such as radio receivers , television sets , MP3 players, video recorders , DVD players , digital cameras , microwaves , personal computers , video game consoles , telephones and mobile phones , laptops and palmtops and fax machines

Term work: For term work assessment the students will have to perform minimum of eight practicals.

1) To study various electronics components: Resistors, Inductors, Capacitors, diodes and transistors.
2) To study CRO and different modes of operation and some application.
3) To plot V-I characteristics of PN junction diode.
4) To plot regulation characteristics of half wave rectifier with and without capacitor filter.
5) To plot regulation characteristics of Full wave rectifier with and without capacitor filter.
6) To plot input-output characteristics of CE configuration of BJT.
7) To study basic logic gates: AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR.
8) To realize the Boolean expression using basic gates.
9) To verify the De-Morgan's theorem.
10) To fabricate at least 5 electronics component on a PCB.

TEXT BOOKS

1. Mottershed Allen, Electronic Devices & Circuits, PHI
2. R. P. Jain, Modern Digital Electronics, Mc Graw Hill

REFERENCE BOOKS

1. Thomas L. Floyd, Electronic Devices, Pearson Education (Sixth edition)
2. Millman & Halkis, Electronic Devices & Circuits, PHI
3. Malvino Leach, Digital Principles & Applications, Mc Graw Hill
4. Millman & Halkis, Integrated Electronics, MGH

Syllabus for Unit Test :

Unit Test 1	Unit I ,II & III
Unit Test 2	Unit IV, V &VI

Workshop Technology

TEACHING SCHEME:	**EXAMINATION SCHEME:**	**CREDITS ALLOTTED:**
Theory: -	End Semester Examination: -	01 Credit
Practical: 02 Hours / Week	Continuous Assessment: -	
	Term Work: 50 Marks	

Course Pre-requisites: Basic knowledge of hand tools used in day to day life.

Course Objectives: Make the students familiar with basic manufacturing processes

Course Outcomes: students should be able to understand

1. basic Manufacturing Processes used in the industry,
2. importance of safety

Term work shall consist of any three jobs, demonstrations on rest of the trades and journal consisting of six assignments one on each of the following topics.

Carpentry- Introduction to wood working, kinds of woods, hand tools & machines, Types of joints, wood turning. Pattern making, types of patterns, contraction, draft & machining allowances
Term work includes one job involving joint and woodturning.

Fitting- Types of Fits, concepts of interchangeability, datum selection, location layout, marking, cutting, shearing, chipping, sizing of metals, drilling and tapping.
Term work to include one job involving fitting to size, male-female fitting with drilling and tapping.

Sheet Metal Practice Introduction to primary technology processes involving bending, punching and drawing various sheet metal joints, development of joints.

Joining- Includes making temporary and permanent joints between similar and dissimilar material by processes of chemical bonding, mechanical fasteners and fusion technologies.
Term work includes one job involving various joining processes like riveting, joining of plastics, welding, brazing, etc.

Forging -Hot working, cold working processes, forging materials, hand tools & appliances, Hand forging, Power Forging.

Moulding -Principles of moulding, methods, core & core boxes, preparation of foundry sand, casting, Plastic moulding.

Plumbing (Demonstration Common for Electrical & Non electrical Group)
Types of pipe joints, threading dies, Pipe fittings.

ENGINEERING MATHEMATICS-II

Teaching Scheme:	Examination scheme:	Credits Allotted:
Lectures: 3Hrs/Week	End Semester Examination: 60 marks	Theory : 03
Tutorials: 1Hr/Week	Continuous Assessment:40 marks	Tutorial : 01

Unit I

DIFFERENTIAL EQUATIONS (DE)

Definition, Order and Degree of DE, Formation of DE.Solutions ofVariable Separable DE, Exact DE, Linear DE and reducible to these types.

(08 Hours)

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.

(08 Hours)

Unit III

FOURIER SERIES

Definition, Dirichlet's conditions, Fourier Series and Half Range Fourier Series,Harmonic Analysis.

INTEGRAL CALCULUS

Reduction formulae, Beta and Gamma functions.

(08 Hours)

Unit IV

INTEGRAL CALCULUS

Differentiation Under the Integral Sign, Error functions.

CURVE TRACING

Tracing of Curves, Cartesian, Pola and Parametric Curves.Rectification of Curves.

(08 Hours)

Unit V

SOLID GEOMETRY

Cartesian, Spherical Polar and Cylindrical Coordinate Systems. Sphere, Cone and Cylinder.

(08 Hours)

Unit VI

MULTIPLE INTEGRALS AND THEIR APPLICATIONS

Double and Triple integrations, Applications to Area,Volume, Mean and Root Mean Square Values.

(08 Hours)

Assignments

1. Differential Equations.
2. Application of DE.
3. Fourier Series and Integral Calculus.
4. DUIS and Curve Tracing.
5. Solid Geometry.
6. Double and Triple integrations, area and volume.

References / Text Books :

1. Advanced Engineering Mathematics by Erwin Kreyszig, Wiley Eastern Ltd, 8th edition(1999).
2. Higher Engineering Mathematics by B.V. Ramana, Tata McGraw-Hill (2008)
3. Applied Mathematics (Volumes I and II) by P. N. Wartikar& J. N. Wartikar, Pune VidyarthiGrihaPrakashan, Pune, 7th edition (1988).
4. Higher Engineering Mathematics by B. S. Grewal, Khanna Publication, Delhi, 42th edition (2012).
5. Advanced Engineering Mathematics, 7e, by Peter V. O'Neil, Thomson Learning,6th edition (2007).
6. Advanced Engineering Mathematics, 2e, by M. D. Greenberg, Pearson Education, 2nd edition(2002).

Syllabus for Unit Test:

Unit Test I :- Unit I,II,III
Unit Test II :- Unit IV,V,VI

FUNDAMENTALS OF MECHANICAL ENGINEERING

Teaching Scheme:	Examination Scheme:	Credits Allotted
Theory: -03Hours / Week	End Semester Examination: -60Marks	04
Practical: 02 Hours / Week	Continuous Assessment: -40Marks	
	Term Work: 25 Marks	

UNIT-I	**Thermodynamics-** Heat, work and Internal Energy, Thermodynamic State, Process, Cycle, Thermodynamic System, First Law of Thermodynamics, Application of First Law to steady Flow and Non Flow processes, Limitations of First Law, PMM of first kind (Numerical Treatment), Second Law of Thermodynamics – Statements, Carnot Engine and Carnot Refrigerator, PMM of Second Kind (Elementary treatment only)	(08)
UNIT-II	**Introduction to I.C. Engines and turbines-** Two stroke, Four Stroke Cycles, Construction and Working of C.I. and S.I. Engines, Hydraulic turbines, steam turbines, gas turbines.(Theoretical study using schematic diagrams) **Introduction to refrigeration, compressors & pumps-** Vapor compression and vapor absorption system, house hold refrigerator, window air conditioner. Reciprocating and rotary compressor, Reciprocating and centrifugal pump. (Theoretical study using schematic diagrams)	(08)
UNIT-III	**Energy Sources** - Renewable and nonrenewable, solar flat plate collector, Wind, Geothermal, Wave, Tidal, Hydro power, Bio-gas, Bio-Diesel, Nuclear power. **Heat transfer**- Statement and explanation of Fourier's law of heat conduction, Newton's law of cooling, Stefan Boltzmann's law. Conducting and insulating materials and their properties, types of heat exchangers and their applications.	(08)

UNIT-IV	**Properties of fluids-** Introduction, Units of measurements, mass density, specific weight, specific volume and relative density, viscosity, pressure, compressibility and elasticity, gas laws, vapor pressure, surface tension and capillarity, regimes in fluid mechanics, fluid properties and analysis of fluid flow. **Properties of Materials and their Applications-** Metals – Ferrous and Non-Ferrous, Nonmetallic materials, smart materials, Material selection criteria.	(08)
UNIT-V	**Mechanical devices** - Types of Belts and belt drives, Chain drive, Types of gears, Types of Couplings, friction clutch (cone and plate), brakes, Power transmission shafts, axles, keys, bush and ball bearings. **Mechanisms-** Slider crank mechanism, Four bar chain mechanism, List of various inversions of Four bar chain mechanism, Geneva mechanism, Ratchet and Paul mechanism	(08)
UNIT-VI	**Machine Tools-** Lathe Machine – Centre Lathe, Drilling Machine – Study of Pillar drilling machine, Introduction to NC and CNC machines, Grinding machine, Power saw, Milling Machine. **Introduction to manufacturing processes and Their Applications-** Casting, Sheet metal forming, Sheet metal cutting, Forging, Fabrication, Metal joining processes.	(08)

List of experiments-

The Term Work shall consist of **any Eight** experiments of following list

1	Measurement of viscosity using Redwood viscometer.
2	Assembly and working of 4-bar, 6-bar, 8-bar planer mechanisms
3	Finding relation between input angle and output angle for various link lengths.
4	Study of domestic refrigerator & window air-conditioner

5	Demonstration of operations of centre lathe
6	Demonstration of operations on drilling machines
7	Demonstration of Two stroke and four stroke engine
8	Study of power transmitting elements: Coupling, Gears and bearings
9	Demonstration of pumps and compressor
10	Study and demonstration of different types of clutches.

References-

1 "Thermodynamics An Engineering Approach" Yunus A. Cengel and Michael A. Boles, McGraw-Hill, Inc,2005,6th edition.
2. "Applied Thermodynamics for Engineering Technologists" T. D. Eastop and A. McConkey, 5th Edition, Prentice Hall.
3. "I.C. Engines Fundamentals" J. B. Heywood, McGraw Hill, 3rd Edition, MacMillian
4. "Internal Combustion Engine ": V. Ganeshan, Tata McGraw-Hill, 3rd edition.
5 "Strength of Materials" H. Ryder, Macmillians, London, 1969, 3rd edition.
6. "Mechanics of Materials" Johston and Beer TMH, 5th edition
7 "Mechanisms and Machine Theory" Ambekar A.G., Prentice-Hall of India**,** 2007.
8. "Theory of Machines" S.S. Rattan, Tata McGraw- Hill, 2nd edition.
9 "A Textbook of production engineering" P.C. Sharma, S. Chand Publication,
New Delhi, 2nd edition.
10 "Fluid Mechanics & Fluid Power" D.S. Kumar, Katson Publishing Engineering House, Ludhiana. 8th edition

Term work shall consist of any three jobs, demonstrations on rest of the trades and journal consisting of six assignments one on each of the following topics.

Carpentry- Introduction to wood working, kinds of woods, hand tools & machines, Types of joints, wood turning. Pattern making, types of patterns, contraction, draft & machining allowances
Term work includes one job involving joint and woodturning.

Fitting- Types of Fits, concepts of interchangeability, datum selection, location layout, marking, cutting, shearing, chipping, sizing of metals, drilling and tapping.
Term work to include one job involving fitting to size, male-female fitting with drilling and tapping.

Sheet Metal Practice Introduction to primary technology processes involving bending, punching and drawing various sheet metal joints, development of joints.

Joining- Includes making temporary and permanent joints between similar and dissimilar material by processes of chemical bonding, mechanical fasteners and fusion technologies.
Term work includes one job involving various joining processes like riveting, joining of plastics, welding, brazing, etc.

Forging -Hot working, cold working processes, forging materials, hand tools & appliances, Hand forging, Power Forging.

Moulding -Principles of moulding, methods, core & core boxes, preparation of foundry sand, casting, Plastic moulding.

Plumbing (Demonstration Common for Electrical & Non electrical Group)
Types of pipe joints, threading dies, Pipe fittings.

10: Engineering Mechanics

TEACHING SCHEME:	**EXAMINATION SCHEME:**	**CREDITS ALLOTTED:**
Theory: 04 Hours / Week	End Semester Examination: 60 Marks	03 Credits
Practical: 02 Hours / Week	Continuous Assessment: 40 Marks	
	Term Work: 25 Marks	01 Credit

Course Pre-requisites:

The Students should have knowledge of

1.	Scalar and Vector
2.	Newton's law of motion
3.	Law of friction
4.	Concept of physical quantities, their units and conversion of units
5.	Concept of differentiation and integration

Course Objectives:

	To develop and apply the concept of resultant and equilibrium for various static and dynamic engineering problems.

Course Outcomes:

The student should be able to

1.	calculate resultant and apply conditions of equilibrium.
2.	analyze the truss and calculate friction force.
3.	calculate centroid and moment of inertia.
4.	solve problem on rectilinear motion.
5.	solve problems on curvilinear motion.
6.	useD'Alembert's principle, Work Energy principle and Impulse Momentum principle for particle.

UNIT - I	**Resultant and Equilibrium**	**(06 Hours)**
	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.	
UNIT - II	**Truss and Friction**	**(06 Hours)**
	Coefficient of Static Friction, Impending motion of Blocks, Ladders and Belts. Analysis of Perfect Trusses - Method of Joint, Method of Section and Graphical Method.	
UNIT - III	**Centroid and Moment of Inertia**	**(06 Hours)**
	Centroid of line and plane areas, Moment of Inertia of plane areas, parallel and perpendicular axis theorem, radius of gyration, least moment of inertia.	

UNIT - IV	**Kinematics of Rectilinear motionof a Particle**	**(06 Hours)**
	Equations of motion, Constant and variable acceleration, Motion Curves, Relative motion, Dependent motion.	
UNIT - V	**Kinematics of Curvilinear motionof a Particle**	**(06 Hours)**
	Motion of a Projectile, Cartesian components, Normal and Tangential components of a curvilinear motion.	
UNIT - VI	**Kinetics of a Particle**	**(06 Hours)**
	D'Alemberts Principle, Work-Energy Principle and Impulse-Momentum Principle, Coefficient of Restitution, Direct Central Impact.	

Term Work:

A) The term-work shall consist of minimum **Five** experiments from list below.

1. Determination of reactions of Simple and Compound beam.
2. Study of equilibrium of concurrent force system in a plane.
3. Determination of coefficient of friction for Flat Belt.
4. Determination of coefficient of friction for Rope.
5. Study of Curvilinear motion.
6. Determination of Coefficient of Restitution.

B) The term-work shall also consist of minimum **Five** graphical solutions of the problems on different topics.

Text 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.

Reference Books:

1. "Engineering Mechanics (Statics and Dynamics)", Shames I.H., Prentice Hall of India (P) Ltd.
2. "Engineering Mechanics (Statics and Dynamics)", Singer F.L., Harper and Row Publication.
3. "Engineering Mechanics (Statics and Dynamics)",Meriam J.L. and Kraige L.G., John Wiley and Sons Publication.
4. "Engineering Mechanics (Statics and Dynamics)",Timoshenko S.P. and Young D.H., McGraw Hill Publication.
5. "Engineering Mechanics (Statics and Dynamics)",Tayal A.K., Umesh Publication.
6. "Engineering Mechanics-I and II (Statics and Dynamics)", Mokashi V.S., Tata McGraw Hill Publication.

Syllabus for Unit Test:	
Unit Test -1	UNIT – I to III
Unit Test -2	UNIT – IV to VI

ENGINEERING PHYSICS

Teaching Scheme:	Examination scheme:	Credits Allotted:
Lectures: 4Hrs/Week	End Semester Examination: 60 marks	Theory: 04
Practical: 2Hr/Week	Continuous Assessment: 40 marks	Practical: 01
	Term Work: 25marks	

UNIT – I

MODERN PHYSICS

Motion of a charged particle in electric and magnetic fields, Electrostatic and Magnetostatic focussing, Wavelength and resolution, Specimen limitation, Depth of field and focus, Electron microscope, Positive rays, Separation of isotopes by Bainbridge mass spectrograph.

NUCLEAR PHYSICS

Nuclear fission, Liquid drop model of nucleus, Nuclear fission in natural uranium, Fission energy, Critical mass and size, Reproduction factor, Chain reaction and four factor formula, Nuclear fuel and power reactor, Nuclear fusion and thermonuclear reactions, Merits and demerits of nuclear energy, Particle accelerators, Cyclotron, Betatron,

(08hours)

UNIT – II

SOLID STATE PHYSICS

Band theory of solids, Free electron theory, 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.

SUPERCONDUCTIVITY

Introduction, Properties of a super conductor, Meissner's effect, Critical field, Types of superconductors, BCS theory, High temperature superconductors, Application of superconductors.

(08hours)

UNIT – III

THERMODYNAMICS

Zeroth law of thermodynamics, first law of thermodynamics, determination of j by Joule's method, Applications of first law, heat engines, Carnot's cycle and Carnot's engine, second law of thermodynamics, entropy, change in entropy in reversible and irreversible processes, third law of thermodynamics.

NANOSCIENCE

Introductions of nanoparticals, properties of nanoparticals (Optical, electrical, Magnetic, structural, mechanical), synthesis of nanoparticals(Physicaland chemical), synthesis of clloids, growth of nanoparticals, synthesis of nanoparticals by colloidal rout, applications.

(08hours)

UNIT-IV

OPTICS - I

INTERFERENCE

Interference of waves, Visibility of fringes, interference due to thin film of uniform and non-uniform thickness, Newton's rings, Engineering applications of interference (optical flatness, interference filter, non-reflecting coatings, multi-layer ARC.

DIFFRACTION

Classes of 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, Rayleigh's criterion for resolution, Resolving power of grating and telescope.

(08 hours)

UNIT-V

OPTICS - II

POLARISATION

Introduction, Double refraction and Huygen's theory, Positive and negative crystals, Nicol prism, Dichroism, Polaroids, Elliptical and circular polarisation, Quarter and half wave plates, Production of polarised light, Analysis of polarised light, half shade polarimeter, LCD.

LASERS

Spontaneous and stimulated emission, Population inversion, Ruby laser, Helium-Neon laser, Semiconductor laser, Properties of lasers, Applications of lasers (Engineering/ industry, medicine, communication, Computers), Holography.

(08 Hours)

UNIT-VI

ARCHITECTURAL ACOUSTICS

Elementary acoustics, Limits of audibility, Reverberation and reverberation time, Sabine's formula, Intensity level, Sound intensity level, 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.

QUANTUM MECHANICS

Electron diffraction, Davisson and Germer's experiment, Wave nature of matter, De-Broglie waves, Wavelength of matter waves, 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.

(08hours)

TERM WORK

Experiments

Any ten experiments 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 Lissajos 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.
14. Determination of refractive index for O-ray and E-ray.
15. Brewester's law.

Assignments

1. Recent advances in Nanotechnology
2. Nuclear radiation detectors.
3. Atomic force microscope (AFM).
4. Advanced opto-electronic devices.
5. Laser in Industry.
6. Different spectroscopic methods – a comparison (Raman, IR, UVR, etc.).

Unit Tests:

Unit Test I : Unit I, II, III

Unit Test II: Unit IV, V, VI

Reference Books:

1. Physics for Engineers – Srinivasan M.R.
2. A text Book of Engineering Physics- M.N. Avadhanulu, P.G. Kshirsagar
3. Engineering Physics- K. Rajagopal
4. Electronics Principles – A.P.Molvino
5. Fundamentals of Optics – Jenkins and White
6. A Textbook of Sound – Wood
7. Engineering Physics – Sen, Gaur and Gupta

02: Fundamentals of Electrical Engineering

TEACHING SCHEME:	**EXAMINATION SCHEME:**	**CREDITS ALLOTTED:**
Theory: 04 Hours / Week	End Semester Examination: 60 Marks	03 Credits
Practical: 02 Hours / Week	Continuous Assessment: 40 Marks	
	Term Work: 25 Marks	01 Credit

Course Pre-requisites:

The Students should have

1.	Mathematics
2.	Physics

Course Objectives:

	The course introduces fundamental concepts of DC and AC circuits, electromagnetism, transformer and measuring instruments and electronic components to all fist year engineering students.

Course Outcomes:

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 safety rules

UNIT - I	**Basic concepts .**	**(06 Hours)**
	Concept of EMF, Potential Difference, current, resistance, Ohms law, resistance temperature coefficient, SI units of Work, power, energy. Conversion of energy from one form to another in electrical, mechanical and thermal systems	
UNIT - II	**Network Theorems**	**(06 Hours)**
	Voltage source and current sources, ideal and practical, Kirchoff's laws and applications to network solutions using mesh analysis, Simplifications of networks using series- parallel, Star/Delta transformation. Superposition theorem, Thevenin's theorem, Max Power Transfer theorem.	
UNIT - III	**Electrostatics**	**(06 Hours)**
	Electrostatic field, electric field intensity, electric field strength, absolute	

	permittivity, relative permittivity, capacitor composite, dielectric capacitors, capacitors in series& parallel, energy stored in capacitors, charging and discharging of capacitors, Batteries-Types, Construction& working.	
UNIT - IV	**Magnetic Circuit & Transformer**	**(06 Hours)**
	Magnetic effect of electric current, cross and dot convention, right hand thumb rule, concept of flux, flux linkages, Flux Density, Magnetic field, magnetic field strength, magnetic field intensity, absolute permeability, relative permeability, B-H curve, hysteresis loop, series-parallel magnetic circuit, composite magnetic circuit, Comparison of electrical and magnetic circuit Farady's law of electromagnetic induction, statically and dynamically induced emf, self inductance, mutual inductance, coefficient of coupling, Single phase transformer construction, principle of operation, EMF equation, voltage ratio, current ratio, kVA rating, losses in transformer, Determination of Efficiency & Regulation by direct load test.	
UNIT - V	**AC Fundamentals & AC Circuits**	**(06 Hours)**
	AC waveform definitions , form factor, peak factor, study of R-L, R-C, RLC series circuit, R-L-C parallel circuit, phasor representation in polar & rectangular form, concept of impedance, admittance, active, reactive, apparent and complex power, power factor, 3-ph AC Circuits.	
UNIT - VI	**Electrical Wiring and Illumination system**	**(06 Hours)**
	Basic layout of distribution system, Types of Wiring System & Wiring Accessories, Necessity of earthing, Types of earthing, Different types of lamps (Incandescent, Fluorescent, Sodium Vapour, Mercury Vapour, Metal Halide, CFL, LED), Study of Electricity bill.	

Term Work:

The term work shall consist of record of minimum eight exercises / experiments.

1. Determination of resistance temperature coefficient
2. Verification of Superposition Theorem
3. Verification of Thevenin's Theorem
4. Verification of Kirchoff's Laws
5. Verification of Maximum power transfer Theorem
6. Time response of RC circuit
7. Study of R-L-C series circuits for $X_L > X_C$, $X_L < X_C$ & $X_L = X_C$
8. Verification of current relations in three phase balanced star and delta connected loads.
9. Direct loading test on Single phase transformer
   a)Voltage and current ratios.
   b) Efficiency and regulations .
10. Study of a Residential (L.T.) Bill

Text Books:
1) B.L.Theraja- “A Textbook of Electrical Technology” Volume- I, S.Chand and Company Ltd.,New Delhi
2) V. K. Mehta, - “Basic Electrical Engineering”, S. Chand and Company Ltd., New Delhi
3) I. J. Nagrath and Kothari – “Theory and problems of Basic Electrical Engineering”, Prentice Hall of India Pvt. Ltd
Reference Books:
1. Edward Hughes – “Electrical Technology”- Seventh Edition, Pearson Education Publication
2. H. Cotton – “Elements of Electrical Technology”, C.B.S. Publications
3. John Omalley Shawn – “Basic circuits analysis” Mc Graw Hill Publications
4. Vincent Del Toro – “Principles of Electrical Engineering”, PHI Publications

Syllabus for Unit Test:	
Unit Test -1	UNIT – I, UNIT – II, UNIT - III
Unit Test -2	UNIT – IV, UNIT – V, UNIT - VI

FUNDAMENTALS OF COMPUTING

TEACHING SCHEME	EXAMINATION SCHEME	CREDITS
Practical: 2 Hours/Week	**Term Work: 50 Marks**	**01**

Course Prerequisite:

Students must possess knowledge about basic fundamentals of computer and professional Microsoft office development tools.

Course Objective:

This course will introduce the concepts of C language software development and compiling tool. By the end of the course, student will be familiar with various fundamentals of C- language, software file system, computer graphics and its various multimedia applications.

Course Outcomes: At the end of the course, a student will be able to

1. **1.** Write C programs using conditional statements and loops**.**
2. Execute the logic using Arrays and strings and perform matrix operation using them.
3. Perform logic operations using Structures &Unions and use them with pointers.
4. Write C program for File manipulations and Dynamic memory allocation
5. Understand the concept and application of Graphics & Multimedia.

Unit –I **(08 Hours)**

Introduction: Computer systems, Hardware & software concepts.
Algorithm / pseudo code, flowchart, program development steps, Computer Languages: machine, symbolic, and high-level languages, Creating and running programs: Writing, editing, compiling, linking, and executing.
Basic of C: Structure of a C program, identifiers, basic data types and sizes. Constants, variables, arithmetic, relational and logical operators, increment and decrement operators, conditional operator, assignment operators, bit-wise Operators expressions, type conversions, conditional expressions, precedence and order of evaluation, Managing input and output operations, Sample programs.
Conditional Statements and Loops: Decision making within a program, conditions, if statement, if-else statement, loops: while loop, do while, for loop. Nested loops, infinite loops, switch statement, sample programs

Unit-II **(08 Hours)**

Arrays & Strings

Arrays - concepts, declaration, definition, accessing elements, storing elements, Strings and string manipulations, 1-D arrays, 2-D arrays and character arrays, string manipulations, Multidimensional arrays , Array applications: Matrix Operations

Unit –III **(08 Hours)**

Function & Pointers

FUNCTIONS: basics, parameter passing, storage classes- extern, auto, register, static, scope rules, user defined functions, standard library functions, recursive functions, Recursive solutions for Fibonacci series, Towers of Hanoi, header files, example c programs. Passing arrays & strings to functions.
Pointers: concepts, initialization of pointer variables, pointers and function arguments, passing by address, address arithmetic, Character pointers and functions, pointers to pointers, pointers and multidimensional arrays.

Unit-IV **(08 Hours)**

Structures & Unions
Derived types- structures- declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self referential structures, unions, typedef, bit-fields, program applications.

Unit-V **(08 Hours)**

Files and Dynamic Memory Allocation

Input and output – concept of a file, text files and binary files, Formatted I/o, file I/o operations, example programs.
Dynamic memory allocation, malloc, calloc, realloc ,free. Concepts of linked lists, Sample programs

Unit-VI **(08 Hours)**
Graphics and Multimedia
Introduction to Computer Graphics: Overview of Computer Graphics, Computer Graphics Application, Description of graphics devices, Input Devices for Operator Interaction
Introduction to Multimedia: History, elements of multimedia – text, audio, video, image, animation, Multimedia applications different areas

TEXT BOOKS

1. Programming in ANSI C – E Balagurusamy (5^{th} Edition-TMH)
2. Computer Graphics: Principles and Practices in C – Andrea Von Dam, Steven K Fiener, F Hughes John [2^{nd} Edition- Pearson]

REFERENCE BOOKS

1. Let Us C- Yashwant Kanitkar
2. D. Hearn, M. Baker, "Computer Graphics - C Version", 2nd Edition, Pearson Education, 2002, ISBN 81 - 7808 - 794 – 4
3. Ralf Steinmetz, Klara Nahrstedt, “Multimedia: Computing, Communication and Applications”
4. Judith Jeffcoate, “ Multimedia Technique”

Term work will consist of minimum of ten assignments based on C programming language.

List of Practicals

1. a. Write a C program to take user Input and print it on the screen.
   b. Write a C program to perform addition or subtraction of two numbers.
   c. Write a C program to find whether the number is Odd or Even.
2. a. Write a C program to find out Prime numbers.
   b. Write a C program to find out Fibonacci series.
3. Write C programs to print different patterns
4. a. Write a C program to do factorial using recursion.
   b. Write a C program to find out Armstrong number.
5. Write a C program to sort the array in Ascending & Descending order.
6. Write C programs to perform operations on 2-D arrays
7. Write a C program to perform different operations on strings.
8. Use of Pointers
   a. Write a C program to swap numbers using pointers
   b. Write a C program to show the use of pointers in arrays.
   c. Write a C program to use functions using pointers.
9. a. Write a C program to create student mark sheet using structures
   b. Write a C program to show the use of structure using pointers
10. Write a C program to perform different operations on Files.
11. Write a C program to create single Linked List.
12. Application of Graphics and Multimedia