

SNDT Women's University

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Syllabus – B Tech in Electronics and Communication



SNDT Women's University
1, Nathibai Thackersey Road,
Mumbai 400 020 Revised – 2008

Eligibility:

Objectives:

SYLLABUS FORMAT

Faculty Name: Technology

Course Name : Electronics and Communication

SCHEME: Semester I

	Subjects	L	Cr	P / T	D	TP	TW	P/V	T
1	Engineering Maths-I	4	5	2	3	100	25		125
2	Applied Science-1	4	6	2	3	100	25		125
3	Engineering Drawing	2	6	4	4	100	50		150
4	Electrical Circuits	4	6	2	3	100	25	25	150
5	Programming in C	4	6	2	3	100	25	25	150
6	Workshop-1		2	2			25	25	50
Total		18	31	14	16	500	175	100	775

SCHEME: Semester II

	Subjects	L	Cr	P / T	D	TP	TW	P/V	T
1	Engineering Maths-II	4	5	2	3	100	25		125
2	Applied Science-II	4	6	2	3	100	25	25	150
3	Electronics Devices	4	6	2	3	100	25	25	150
4	Introduction to Mechanics and Thermodynamics	4	5		3	100	25		125
5	Communications Skills	4	5		3	100	25		125
6	Programming inC++	4	6	2	3	100	25	25	150
7	Workshop-II		2	2			25	25	50
Total		24	35	10	18	600	175	100	875

SCHEME: Semester III

	Subjects	L	Cr	P / T	D	TP	TW	P/V	T
1	Engineering Maths-III	4	5	2	3	100	25		125
2	Discrete Electronics	4	6	2	3	100	25	25	150
3	Digital Logic Circuits	4	6	2	3	100	25	25	150
4	Electrical Network Theory	4	6	2	3	100	25	25	150
5	Electronics Measurements and Instruments	4	6	2	3	100	25	25	150
6	Electronics Materials and Components	4	5		3	100	25		125
Total		24	34	10	18	600	150	100	850

SCHEME: Semester IV

	Subjects	L	Cr	P / T	D	TP	TW	P/V	T
1	Probability and Random Theory	4	5	2	3	100	25		125
2	Numerical methods in Electrical Engineering	4	6	2	3	100	25	25	150
3	Principles of Communications	4	6	2	3	100	25	25	150
4	Analog Circuits	4	6	2	3	100	25	25	150
5	Electromagnetic Wave Theory	4	5		3	100	25		125
6	Computer Architecture and Organization	4	5		3	100	25		125
	MEDT Lab Practice		1	2				25	25
Total		24	34	10	18	600	150	100	850

SCHEME: Semester V

	Subjects	L	Cr	P / T	D	TP	TW	P/V	T
1	Microprocessor and Microcontrollers	4	6	2	3	100	25	25	150
2	Communication Filters	4	6	2	3	100	25	25	150
3	Antenna and Wave propagation	4	6	2	3	100	25	25	150
4	Control System	4	6	2	3	100	25	25	150
5	Communication Skills-2	0	2	2			25	25	50
6	Signals and Systems	4	5	2	3	100	25		125
7	Seminar		1	2				25	25
Total		20	32	14	15	500	150	150	800

SCHEME: Semester VI

	Subjects	L	Cr	P / T	D	TP	TW	P/V	T
1	Microprocessor-II	4	6	2	3	100	25	25	150
2	Digital Communication	4	6	2	3	100	25	25	150
3	Digital Signal Processing	4	6	2	3	100	25	25	150
4	Microwave Engineering	4	6	2	3	100	25	25	150
5	Elective-I	4	6	2	3	100	25	25	150
6	Mini Project		2	2			25	25	50
Total		20	32	12	15	500	150	150	800

SCHEME: Semester VII

	Subjects	L	Cr	P / T	D	TP	TW	P/V	T
1	Computer and Communication Network	4	6	2	3	100	25	25	150
2	Fiber Optics Communication	4	6	2	3	100	25	25	150
3	Management for IT Professionals	4	6	2	3	100	25	25	150
4	Elective-II	4	6	2	3	100	25	25	150
5	Project		8	16			50	150	200
Total		16	32	24	12	400	150	250	800

SCHEME: Semester VIII

	Subjects	L	Cr	P / T	D	TP	TW	P/V	T
1	Embedded Systems	4	6	2	3	100	25	25	150
2	Wireless and Mobile Communication	4	6	2	3	100	25	25	150
3	Elective-III	4	6	2	3	100	25	25	150
4	Elective-IV	4	6	2	3	100	25	25	150
5	Projects		8	16			50	150	200
Total		16	32	24	12	400	150	250	800

L = No. of Lectures / week, P / T = Practical / Tutorial in hrs, D = Duration of Theory paper for Examination in hrs, TP = Theory Paper-marks, TW = Term Work - marks, P/V = Practical / Viva Voce - marks, T = Total

ENGINEERING MATHS – I

Sr. No:	Topics and Details	No: of lectures assigned	Marks assigned
1	Partial Differentiation - Definition, differentiation of composite implicit functions, chain rule	4	20
2	Euler's theorem on Homogeneous functions		
3	Total differentiation of composite functions using partial differentiation.	6	
4	Errors and approximation,		
5	Extreme values of functions of two variables, applications in engineering.		
6	Differential equation of 1st order and 1st degree, Linear – equations. Bernoulli's equations.	2	20
7	Exact differential equations – integrating factors.	2	
8	Differential equations of higher order. Differential operator D, Where $f(D)y = X$, $\{x = e^{ax}, \sin(ax+b), \cos(ax+b), x^m, e^{ax} f(x)\}$.	6	
9	Linear differential equations with constant and variable coefficients. (Cauchy Linear Equations and Legendre's Linear equations).	8	15
10	Simple applications (Where the differential equation is given). in Engg. field		
11	Successive differentiation, Leibnitz's theorem (without proof) and applications in engg. field.	7	15
12	M V T - Rolle's mean value theorem, Lagrange's and Cauchy's Mean value theorem. Applications in Engg		
13	Definition of complex numbers Cartesian, Polar and exponential form.	7	15
14	De-Moiver's theorem and roots of complex numbers.		
15	Hyperbolic functions Separation real and imaginary parts of circular & Hyperbolic functions.	8	15
16	Logarithm of complex numbers. Applications in Engg.		

Text Book:-

1. P.N.Wartikar & J. N. Wartikar, Elements of Applied Mathematics, 1st edition, Pune Vidyarthi Griha Prakashan, 1995. (rs. 110/-)

Reference Books:

1. B. S. Grewal, Higher Engineering Mathematics, 34th edition, Khanna Publishers, 1998. (Rs. 170).
2. Shanti Narayan, Matrices, 9th Edition, S. Chand, 1997. (Rs. 45/-)
3. Shanti Narayan, Differential Calculus, 14th Edition, S. Chand, 1996. (Rs. 60/-)
4. A. R. Vashishtha, Matrices, 27th Edition, Krishna Prakashan Mesdia(P) Ltd; 1996. (RS. 75/-)
5. Edwin Kreyszig, Advance Engg. Mathematics, 5th Edition, New Age International (P) Ltd; 1997. (Rs. 295/-)

APPLIED SCIENCE - I

Sr. No.	Topic and Details	No. of Lectures assigned	Weightage in %
	Structure of Atom:- Boh'r Model Modern quantum theory of atom, Rutherford model, Molecular orbital theory, Band theory of solids, Fermilevel quantum theory, Atomic Properties:- size, ionization energy, Electron Affinity, electro negativity semiconductor and Insulator, . Semiconductors & insulators. Elemental & compound semiconductors, Intrinsic & extrinsic semiconductors.	8	16
	Uncertainty Principle, Wave equation, Energy levels and Quantum numbers.	2	4
	Paul's Exclusion principle, Distribution of electrons, Aufbau principle, deviation from Aufbau principle, classification of Elements.	4	8
	Spectroscopy:- Introduction to Electromagnetic radiation, Frequency, Wavelength and wave number, principle various spectroscopy.	4	8
	Magnetic Properties of Materials	6	12
	Physics of Semiconductors – band theory, Metals semiconductors and insulators, Direct and Indirect Semiconductors, Fermi Level, Breakdowns.	6	12
	Introduction to Fiber Optic Communication, Optical Sources:- LED's and Lasers, Introduction to Few Common Lasers Like Ruby, He-Ne etc. Photo-detectors	4	8
	Ultrasonic – Magnetostrictive effect and transducers, Ferromagnetic materials, Piezoelectric effect:- crystals, Transducer, Applications, Cleaner Low power application; methods of testing materials.	6	12
	Superconductors - various Properties and effects, Types, London equations, BCS theory, Josephson effect and junctions, Applications	4	8
	Introduction to Electromagnetic - Laws of Physics, Expressing in Terms of Maxwell's Equations and various laws	4	8
	High frequency heating, Electromagnetic and photoelectric relays.	2	4
		50	100

Text Book:-

Newman and Searle, "General Properties of Matter", Ernest Benn Ltd. London, 1963

D. S. Mathur, "Elements of Properties of Matter", Shyam Lal Charitable Trust, 10th Ed., 1969

Reference Books

Indu Prakash, "Optics" Kishore Publishing House, 3rd Ed., 1960.

S. M. Sze, "Physics & Technology, Semiconductor Devices"

S. M. Sze, "VLSI Technology", McGraw Hill

ENGINEERING DRAWING

Semester: I
Branch : ENC / CST / IT

Lectures: 2 Hr
Credit : 04

Sr. No:	Topics and Details	No: of lectures assigned	Marks assigned
1	INTRODUCTION TO ENGINEERING DRAWING – Use of different drawing instruments, equipments and drawing techniques, Types of letters, Types of lines, dimensioning, Redraw.	2	08
	Scales , Plain scales, Diagonal scales, Comparative scales	4	08
2	GEOMETRICAL CONSTRUCTION AND ENGINEERING CURVES Dividing of lines and angles in equal sectors, Construction of polygons, Polygons inscribed in circles.	2	08
	Different methods of drawing Parabola, Hyperbola, Ellipse, Cycloid, & Involute.	4	16
3	ORTHOGRAPHIC PROJECTIONS – Introduction to Orthographic Projections, First angle and third angle method of projection, More no. of problems should be practiced in first angle projection, Conversion of simple pictorial view into orthographic view, dimensioning technique.	6	20
4	PROJECTION OF POINTS & LINES – Projection of Points in different quadrants & lines inclined to one reference plane only.	4	10
5	ISOMETRIC VIEW AND ISOMETRIC PROJECTION Isometric scale and views of simple objects, Isometric views of rectangular, cylindrical objects and representation of slots on sloping faces.	4	20

Recommended Books

1. Narayana, K.L. and Kannaiah, P “Engineering Graphics” Tata Mcgraw Hill
2. Bhatt, N.D. “Elementary Engineering Drawing” Charotar book stall, Anand 1998
3. Lakshminarayanan, V and Vaish Wanar, R.S. “Engineering Graphics” Jain Brothers, New Delhi
4. Chandra, A.M. and Chandra Satish, “Engineering Graphics” Narosa,
5. Venugopal K. : Engineering Drawing & Graphics + Auto CAD, New Age International
6. Venugopal K. : Engineering Graphics, New Age International

Sr. No.	Topic and Details	No. of Lectures assigned	Weigtage in %
	INTRODUCTION TO ENGINEERING DRAWING – Use of different drawing instruments, equipments and drawing techniques, Types of letters, Types of lines, dimensioning, Redraw. Scales , Plain scales, Diagonal scales, Comparative scales	6	16
	. GEOMETRICAL CONSTRUCTION AND ENGINEERING CURVES Dividing of lines and angles in equal sectors, Construction of polygons, Polygons inscribed in circles. Different methods of drawing Parabola, Hyperbola, Ellipse, Cycloid, & Involute.	6	24
	ORTHOGRAPHIC PROJECTIONS – Introduction to Orthographic Projections, First angle and third angle method of projection, More no. of problems should be practiced in first angle projection, Conversion of simple pictorial view into orthographic view, dimensioning technique.	6	20
	PROJECTION OF POINTS & LINES – Projection of Points in different quadrants & lines inclined to one reference plane only.	4	10
	ISOMETRIC VIEW AND ISOMETRIC PROJECTION Isometric scale and views of simple objects, Isometric views of rectangular, cylindrical objects and representation of slots on sloping faces	4	20
	.	26	100

Text Book :-

1. Bhatt, N.D. “Elementary Engineering Drawing” Charotar book stall, Anand 1998
2. Narayana, K.L. and Kannaiah, P “Engineering Graphics” Tata Mcgraw Hill
3. Bhatt, N.D. “Elementary Engineering Drawing” Charotar book stall, Anand 1998
4. Lakshminarayanan, V and Vaish Wanar, R.S. “Engineering Graphics” Jain Brothers, New Delhi
5. Chandra, A.M. and Chandra Satish, “Engineering Graphics” Narosa,
6. Venugopal K. : Engineering Drawing & Graphics + Auto CAD, New Age International
7. Venugopal K. : Engineering Graphics, New Age International

ELECTRICAL CIRCUITS

Sr.No.	Topic with its details	No.of Lect.	No.of Marks
1	Basic system concepts: -Physical and Electrical systems (field/circuit approach),Terminals,terminals pairs,through and across variables,Two /multiterminals components,Basic variables-charge,coloumb'slaw,ohm's law,electric potential and voltage,electric current,current density,electrical energy and power,electrical units,representation of variables,sign conventions and reference directions.	4	8
2	Classification of devices of electrical circuits: Basic components of the circuit model a)Resistance b)Inductance c)Capacitance ,Parameters and its representations (sign conventions and graphical representations.	4	8
3	Electrical Sources: -Different types of Energy Sources ,Ideal sources a)current b)voltage,Dependent and independent sources,transformation of energy sources	4	8
4	Classification of Elements: -Criteria for classification,a)Lumped/Distributed b)Linear/Non linear elements c)Passive/Active elements d)Bilateral/non bilateral elements e)Time variant/Time invariant elements	4	8
5	Basic circuit Analysis:- Nodal analysis with voltage source,nodal analysis with current source,Mesh analysis using Matrix and Loop method a)Super mesh b)supernode	6	12
6	Transient Analysis: Introduction,Differential equation,order of the circuit,network equation,initial and final conditions of basic elements,Problems based on the above concepts concentrating on RL,RC,LC,RLC circuits	4	8
8	Network Theorems: Superposition ,thevenin's theorem,norton's theorem,Substitution,Reciprocity,Maximum power transfer theorem,tellegen's theorem,star-delta transformation	8	16

9	<p>Introduction to A.C. Circuits/Steady state analysis:- Introduction &alternating currents and voltages a)sine wave,angular relation,phase of a sine wave,sine wave equation b)concepts of lead/lag c)voltage and current values of a sine wave,Instntaneous value,peak value,R.M.S. value,average value.form factor</p> <p>Phase relation:-a)in a pure resistor b)pure inductor c)pure capacitor d)AC thru. RL in series e)AC thru. RC in series f)series RLC</p> <p>Series resonance,parallel branched A.C. circuit a)RLC b)parallel resonance.</p> <p>Power in A.C. circuits: a)pure resistor,capacitor and inductor circuits b)Concepts of power factors ,application of power factor,phasor diagrams.</p>	8	16
10	<p>Transformers:-Types of transformers,testing of transformers,Ideal transformers</p>	8	16
	Total	50	100

Text Book:-

1. .B.L.Theraja,"Electrical Engg. &Technology",2nd Edition ,S.chand &Co.2005
2. W.H. Hayt and J.E Kemmerley, " Engineering Circuit Analysis", 4th Edtion, Mc Graw Hill, 1986.

References:-

- 1.Murthy & Kamath,"Basic Circuit Analysis",2nd Edition,JaicoPublishing Home.
- 2.B.L.Theraja,"Electrical Engg. &Technology",2nd Edition ,S.chand &Co.
- 3.Van Valkenberg,"Network analysis",3rd Edition,Prentice Hall of India.

PROGRAMMING LANG C

Semester: I
Branch: ENC / CST / IT

Lect: 4 Hr
Credit: 04

Sr	Topic	No. of Lect required	Marks Weightage
	Introduction: Flowcharts, algorithms, importance of C, Basic structure of C programs.	02	4
	Basic notation: Constants such as integer, real, character, string, and backslash character, variables, declaration of variables, Data types such as fundamental, user defined, and derived, user defined type declaration, assignment statement, defining symbolic constants, Operators, different types of operators such as arithmetic, relational, logical, assignment, increment, decrement, conditional, bitwise, and special, Expression, precedence of arithmetic operator, computational problems, type conversions in expression, different rules of conversion, casting a value, operator precedence and associativity.	06	12
	Input – Output Functions: different format specifiers, formatted input function scanf (), other input functions such as getchar (), getch(), getche(), gets(), formatted output function printf(), other output functions such as putchar (), puts() different character test functions.	06	12
	Decision Making and Branching: Simple if statement, the if-else statement, Nested if ... else statements, the else ... if ladder, the switch statement, goto statement, continue statement, break statement.	04	8
	Loop: loops, different types of loop such as entry control, and exit control, the while statement, the do statement, the for statement, nested for loop jumps in loops.	04	8
	Arrays: Definition, one-dimensional array, general form of array declaration, initialization of array, two-dimensional array, initializing two-dimensional array, multidimensional array, applications of array.	04	8
	Strings: Reading a string, writing a string, different string handling functions such as strcat(), strcmp(), strcpy(), and strlen().	04	8
	Functions: Different types of functions such as library and user defined, difference between them, need of function, advantages of functions, declaration of a function, function call, definition of a function, return values and their types, category of a function, void function, nesting of functions, recursion, function with array, scope of a variable, internal and external variable, storage classes such as automatic, external, static, register.	06	12

	Structures: Definition, various ways of declaration of structure variable, structure initialization, arrays of structures, arrays within structure, structures within structures, structures and functions, unions, bit fields.	04	8
	Pointers: Why pointers, accessing the address of a variable, pointer declaration, pointer initialization, accessing a variable through its pointer, pointer to pointer, pointer expressions, passing address to a function(call by reference), function returning pointers, pointers and arrays, passing array elements to a function, pointer and two dimensional array, pointer and three dimensional array, arrays of pointers, pointers and structure. Link List: dynamic memory allocation, allocation of memory using malloc(), and calloc(), releasing the used space by using free() function, linked list, advantages and disadvantages of linked list, basic operations on linked list such as creation, traversing, counting the number of nodes in a list, printing a list, insertion, deletion, searching, concatenation of two list.	06	12
	File Management: Defining and opening a file, closing a file, Input/Output operations on files, structure storage in file.	04	8

Text Book :-

1. E.Balgurusamy, "Programming in ANSI C", 2nd edition, Tata McGraw Hill.

References:

1. Yashavant Kanetkar, "Let Us C", 3rd edition, BPB Publications.
2. P.B. Mahapatra, "Thinking in C", Wheeler Publishing.
3. Yashavant Kanetkar, "Understanding Pointers in C", 2nd edition, BPB Publication.

WORKSHOP-I

Sr. No	Detail Syllabus	
	Worshop consist of the Jobs to be done in Mechanical Engineering	

ENGINEERING MATHEMATICS – II

Sr. No:	Topics and Details	No: of lectures assigned	Marks assigned
1	Matrices – Types of Matrices. Adjoint of a matrix, Inverse of a matrix by using Adjoint	6	12
2	Elementary transformations. Rank of a matrix. Reduction to a normal form.		
3	Partitioning of matrices, Orthogonal Matrices		08
4	System of homogeneous and non – homogeneous equations, their consistency and solutions	4	
5	Linear dependence and independence of rows and columns of a matrix area in a real field	2	4
6	Eigen values and Eigen vectors. Cayley Hamilton theorem, Minimal Polynomial – Derogatory and non derogatory matrices.	2	4
7	Vector Algebra And Vector Calculus – Product of three or more vectors, LaGrange’s Identity	2	8
8	Vector differentiation – rules and theorems on vector differentiation	2	
9	Scalar point functions and vector point function, gradient, divergent and curl and applications	4	8
10	Solenoidal and irrotational fields, scalar potential of irrotational vectors, Laplace’s equations in harmonic function - applications in engineering.	4	8
11	Differentiation Under Integral Sign – Theorems on differentiation under integral sign (without proof).	2	4
12	Integral Calculus – Curve tracing (Standard curves) Rectification (Arc length).	4	8
13	Double Integrals – Change of order of integration, double integration of polar coordinates,	6	12
14	Application of single and double integration – mass and volume, triple integration, Applications	4	08
15	Error Functions –Error functions and its properties, problems based on it,	2	4
16	Beta And Gamma Functions – beta and gamma functions, properties, relation between beta & gamma functions,	2	4
17	Duplication formula and problems based on it, applications in engineering.	4	8

	Total	50	100
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Text book:

1. B. S. Grewal, Higher Engineering Mathematics, 34th edition, Khanna Publishers, 1998. (Rs. 170).

References:

1. P.N.Wartikar & J. N. Wartikar, Elements of Applied Mathematics, 1st edition, Pune Vidyarthi Griha Prakashan, 1995. (rs. 110/-)
2. Shanti Narayan, Differential Calculus, 14th Edition, S. Chand, 1996. (Rs. 60/-)
3. Murry Spiega, Vector Analysis
4. Edwin Kreyszig, Advance Engg. Mathematics, 5th Edition, New Age International (P) Ltd; 1997. (Rs.295/-)

APPLIED SCIENCE - II

Sr. No.	Topic and Details	No. of Lectures assigned	Weightage in %
	Interference, Diffraction, Theory of Colors	6	12
	Ultrasonic, X rays, Radioisotopes production and their applications.	8	16
	Magnetic permeability, susceptibility of solids and liquids.	8	16
	Quantum nature of radiation, Black body spectrum, hypothesis and various laws. Photoelectric effect. Compton effect, derivation for Compton shift, matter waves, Heisenberg's uncertainty principles and its applications.	8	16
	Phase rule, Application to various systems.	6	12
	Electrochemistry & Corrosion - Conductance, Conductivity cell, Kohlrausch's law, weak electrolyte, Ionic product of water, Solubility, Direct corrosion, various theories Concentration cell corrosion. Factors affecting corrosion, Different types of corrosion, Prevention of corrosion, Introduction to application of metallic coating,	8	16
	Introduction to Crystal Growth, Introduction to Crystallography	6	12
		50	100

Text Book:-

Newman and Searle, "General Properties of Matter", Ernest Benn Ltd. London, 1963

Reference Books:-

D. S. Mathur, "Elements of Properties of Matter", Shyamal Charitable Trust, 10th Ed., 1969

Reference Books

Indu Prakash, "Optics" Kishore Publishing House, 3rd Ed., 1960.

S. M. Sze, "Physics & Technology, Semiconductor Devices"

S. M. Sze, "VLSI Technology", McGraw Hill

ELECTRONICS DEVICES

Sr. No.	Topic and Details	No. of Lectures assigned	Weightage in %
	Modelling of Devices:- static characteristics of ideal two terminals and three Terminal, devices,small signal models of nonlinear devices	6	12
	Semiconductor Diodes: construction and characteristics, static and dynamic resistance,temp. effects, Avalanche and zener diodes and its breakdown, Small signal models of diodes ,some application of diodes, like rectifiers(half wave,centre tapp ,bridge with its parameters, and problems based on it clippers and clippers, and also types of biasing in detail.	8	16
	Filters: C,L,LC,CLC with its analysis in detail	6	12
	Bipolar junction Transistor:- Construction and types,characteristics, BJT as a amplifier,B,CE,CC Configuration, Biasing Types,dc analysis and stability factor,DC load line and Ac load line	8	16
	Single stage transistor amplifiers(CB,CE,CC):- :H-Parameters,small signal low frequency ac equivalent circuit., h-parameters measurements with transistor biasing.,	6	12
	JFET(Junction field effect transistor): Construction and working with its characteristics FET as a amplifier,CS,CD,CG, configuration. Biasing Types,Low frequency small signal ac equivalent circuit of JFET amplifiers.h-parameters measurements with JFET biasing.	8	16
	CMOS And SCR:- Construction , characteristics and working of CMOS with application., Construction , characteristics and working of SCR., Rating and Terminal identification ,application of SCR,	8	16
		50	100

Text Book

Boylstead and Neshelasky, "Electronics Devices and Circuit," PHI 1997.

References

Milman Gabel , "Microelectronics", Tata Macgraw Hill. 1998

INTRODUCTION TO MECHANICS AND THERMODYNAMICS

Sr. No.	Topic and Details	No. of Lectures assigned	Weightage in %
	FORCE SYSTEM – Fundamental concepts, force, characteristic of a force, resolution of a force, resultant of coplanar concurrent force system, method of resolution and composition, resultant of non-coplanar concurrent force system, principle of moments, resultant of coplanar parallel force system, Couple.	4	8
	EQUILLIBRIUM – Free body diagram (fbd), conditions of equilibrium for a concurrent coplanar force system, Lami's theorem, support reactions.	6	12
	CENTRE OF GRAVITY – Methods to determine center of gravity, problems based on plane laminae, problems on solids.	2	4
	ANALYSIS OF TRUSSES - Types of supports, method of joints, method of sections, comparison between method of joints and method of sections	6	12
	FRICITION – Introduction, types of friction, concept of dry friction, types of friction problems, laws of friction, problems.	4	8
	ENGINEERING THERMODYNAMICS Introduction and Basic concepts, Thermodynamics and its laws, classification of system, macroscopic and microscopic view of a system, Thermodynamic process, Quasi static process, Pressure, Temperature, Volume, Numericals	6	12
	I-law of Thermodynamics- statement, Work , Energy, Heat, Law of conservation of Energy, Heat & Work, path function, specific heats, Numericals, Equation of steady flow, Non flow processes, Limitations of I-law of Thermodynamics, PMM-I	8	16
	II-law of Thermodynamics, statement, Kelvin Planck Statement, Clausius Statement, PMM-II , Heat engine, C.O.P., Refrigerator, Numericals, Thermal Efficiency, Carnot cycle, Limitations of carnot cycle, Numericals on Carnot cycle	8	16
	Heat Transfer – basics, modes of heat transfer, Newton's Law of cooling, Fourier's law of heat conduction , Numericals, Thermal conductivity, Heat Transfer by conduction, Heat Transfer by convection and radiation, Numericals, Heat Transfer through composite slab, Radial Heat Transfer through a thick cylinder, Numericals, Heat sink , basic concepts, applications.	6	12
		50	100

COMMUNICATION SKILLS – I

Sr. No:	Topics and Details	No: of lectures assigned	Marks assigned
1	The Theory of Communication	5	10
2	Business Correspondence	5	10
3	Types of communication	5	10
4	Technical writing	5	10
5	Summary writing.	5	10
6	Group Discussion.	5	10
7	Oral Communication practice	5	10
8	Vocabulary and grammar exercises	5	10
9	Comprehension exercises	5	10
10	Meeting documentation	5	10

Text book:

1. Krishna Mohan and Meera Banerjee. (2007). Developing Communication Skills. McMillian & India Limited., Rs. 90.

References:

1. Sushil Bhal, "Business Communicatio Today", Response Boojks, 1996, Rs. 125/-
2. Krishan Mohan, R.C. Sharma, "Business Correspondence and Report writing" Tata Mcgraw Hill, 2007, Rs. 110.
E.H. Macgrraw, "Basic Managerial Skills for all" PHL, 1996, Rs. 125.

PROGRAMMING LANG. C++

Topics to be covered	No.of lectures required	Marks
Introduction	2	4
Tokens, expression, and control structures, Operators in C++	2	4
Console I/O Streams, predefined streams, hierarchy of stream classes, unformatted and formatted console I/O operations, user defined manipulators, insertion and extraction, operators.	2	4
Functions in C++ parameter passing techniques such as call by value, call by address, and call by reference, return by reference, inline functions, default arguments, function overloading, function overriding.	2	6
Pointers pointer definition, de-referencing of pointer, parameter passing, void pointer, precedence of * and [] operators, pointer to function, pointer to constant object, constant pointer, wild pointers.	2	4
Classes and objects Introduction to classes and objects, programming with member functions and classes, access specifiers such as public, protected, and private	2	7
Classes and objects constant member function, static data members, friend function, and friend classes.	2	
Classes and objects static member functions, local classes	2	
Constructor and destructor Definition of constructor and destructor, benefits of constructors, default constructor, default argument constructor, dynamic initialization, dynamic constructor, copy constructor, parameterized constructor, constructor overloading, constant objects	2	7
Constructor and destructor dynamic objects, pointer to object definition, creation and deletion of dynamic objects, reference to an object, live objects, array of objects, pointer to object members, accessing members through objects, and object pointers, function set_new_handler (), this pointer	2	7
Operator overloading Operator overloading, rules for overloading operators, syntax, process of operator overloading, unary operator overloading, binary operator overloading,	2	6
Data conversion conversion between user defined data type to basic data type, conversion between basic data type to user defined data type, overloading of special operator such as subscript, function call, member access, comma, assignment, new and delete operators, overloading with friend functions, benefits of operator overloading	2	6
Inheritance Introduction, derived class declaration, visibility of class members, different types of inheritances such as single, multiple, hierarchical, multilevel, hybrid, multipath, inheritance and member accessibility, constructor in derived class, order of invocation of constructor	2	6

Inheritance destructor in derived class, constructor invocation and data member initialization, ambiguity in member access, virtual base class, object composition and delegation, relationship between classes such as is-kind-of, is-analogous-of, and is-part-of.	2	6
Virtual Function Introduction, pointer to derived class, array of pointers to derived class, pure virtual function, abstract class, virtual destructors, dynamic binding.	2	5
Generic programming Introduction, generic functions, syntax, overloading function template, class template, syntax, class template with multiple arguments	2	7
Generic programming , inheritance of class template, class template containership, class template with overloaded operators.	2	
Coupling and Cohesion, Collaborations	2	6
File Handling Introduction, classes for stream operation, opening and closing of file	2	7
File Handling file I/O with fstream classes, file pointer manipulators, file modes.	2	
Exception Handling Different techniques of building reliable models such as fault avoidance and fault tolerance, error handling, types of exceptions such as synchronous and asynchronous, exception handling model, exception handling constructs such as throw, catch, and try, handler throwing same exception again, list of exceptions, raising an unspecified exception, exceptions in no-exception function	2	8
Exception Handling catch all exceptions, method of handling uncaught exceptions, exception in constructors, destructors, operator overloaded function, inheritance tree, and class template, fault tolerant design techniques such as N-version programming and recovery block.	2	

Text Book

1. Mastering C++ by Venugopal

Reference Book

1. Object Oriented Programming by Balguruswami
2. Programming in C++ by Robart Lahore
3. Complete reference to C++

WORKSHOP-II

Workshop consist of the Jobs to be done in Electrical Engineering and understanding, testing, and building the electronics circuits on PCB.

Workshop consist of the Jobs to be done in Mechanical Engineering and understanding, testing, and building the electronics circuits on PCB.