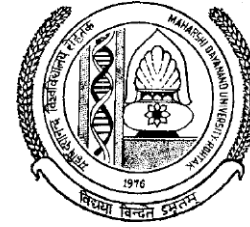# Maharshi Dayanand University
Rohtak

Ordinance, Syllabus and Courses of
Reading for
B.Tech. - 1st Year
(Semester I and II)

Session –wef. 2013-
2014

M.D.UNIVERSITY, ROHTAK
SCHEME OF STUDIES, SYLLABUS & EXAMINATIONS
B.Tech. Ist Year-2013-14
SEMESTER-I (Common For All Branches)

Course Notation	Course No.	Course Title	L	T	P	Total	Marks of class Exam.	Theory	Practical	Total Marks	Durati Marks
C	HUM-101F	Essentials of Communication	3	1	0	4	50	100	-	150	3
C	MATH-101F	Mathematics-I	4	1	0	5	50	100	-	150	3
C	PHY-101F	Physics-I	3	1	0	4	50	100	-	150	3
A	ECE-101F	Basics of Electronics	3	0	0	3	50	100	-	150	3
		OR									
B	CH-101F	Engineering Chemistry	3	1	0	4	50	100	-	150	3
A	CSE-101F	Fundamentals of Computer & Programming in C	3	1	0	4	50	100	-	150	3
		OR									
B	EE-101F	Electrical Technology	3	1	0	4	50	100	-	150	3
A	ME-101F	Basics of Mechanical Engineering	3	0	0	3	50	100	-	150	3
		OR									
B	ME-103F	Engg. Graphics & Drawing	1	0	3	4	50	-	100	150	4
C	PHY-103F	Physics Lab-I	0	0	2	2	25	-	25	50	3
A	CSE-103 F	FCPC Lab	0	0	2	2	25	-	25	50	3
		OR									
B	EE-103F	Electrical Technology Lab	0	0	2	2	25	-	25	50	3
A	ECE-103F	Basics of Electronics Lab	0	0	2	2	25	-	25	50	3
		OR									
B	CH-103F	Engineering Chemistry Lab	0	0	2	2	25	-	25	50	3
A	ME-107F	Basics of Mech. Engg. Lab	0	0	2	2	25	-	25	50	3
		OR									
B	ME-105 F	Workshop Technology	2	0	2	4	50	-	25	75	3
A	GES 106F	Environmental Studies	3	0	1	4	-	-	-	-	-
	Total		**22/19**	**4/5**	**9/11**	**400/425**	**600/500**	**100/200**		**1100/1125**	

Course Notation	Course No.	Course Title	L	T	P	Total	Marks of class	Theory	Practical	Total Marks	Durati Marks
C	HUM-102F	Communication Skills in English	3	1	0	4	50	100	-	150	3
		OR									
C	BTT- 102 F	Basics of Biotechnology	3	1	0	4	50	100	-	150	3
C	MATH-102F	Mathematics-II	4	1	0	5	50	100	-	150	3
C	PHY-101F	Physics-II	3	1	0	4	50	100	-	150	3
B	ECE-101F	Basics of Electronics	3	0	0	3	50	100	-	150	3
		OR									
A	CH-101F	Engineering Chemistry	3	1	0	4	50	100	-	150	3
B	CSE-101F	Fundamentals of Computer & Programming in C	3	1	0	4	50	100	-	150	3
		OR									
A	EE-101F	Electrical Technology	3	1	0	4	50	100	-	150	3
B	ME-101F	Basics of Mechanical Engineering	4	0	0	4	50	100	-	150	3
		OR									
A	ME-103	Engg. Graphics & Drawing	1	0	3	4	50	-	100	150	4
C	PHY-104F	Physics Lab-II	0	0	2	2	25	-	25	50	3
B	ECE-103 F	Basics of Electronics Lab	0	0	2	2	25	-	25	50	3
		OR									
A	CH-103F	Engineering Chemistry Lab	0	0	2	2	25	-	25	50	3
B	CSE-103 F	FCPC Lab	0	0	2	2	25	-	25	50	3
		OR									
A	EE-103F	Electrical Technology Lab	0	0	2	2	25	-	25	50	3
C	GP-102F	General Proficiency	-	-	-	-	50	-	-	50	
B	ME-107F	Basics of Mech. Engg. Lab	0	0	2	2	25	-	25	50	3
		OR									
A	ME-105 F	Workshop Technology	2	0	2	4	50	-	25	75	3
B	GES 106F	Environmental Studies	3	0	1	4	-		-	-	
	Total		**19/23**	**4/5**	**9/11**	**400/425**	**600/500**		**100/200**	**1100/1125**	

SCHEME AND SYLLABUS OF
B.Tech First year
(COMMON FOR ALL BRANCHES)
to be effective from 2013-2014 batches

Important Notes :

1. Signifiance of the Course Notations used in this scheme :-

    C = These courses are common to both the groups Group-A and Group -B.

    A = Other compulsory courses for Group-A.

    B = Other compulsory courses for Group-B.

    Students will study either Group A (ECE-101F, CSE-101 F, ME-101F, CSE-103 F, ECE-103 F, ME - 107 F, GES-106 F)

    OR

    Group B(CH-101F, EE-101F, ME-103F, EE-103D, CH-103F, ME-105F)

Students will be allowed to use nonprogrammable scientific calculator, however sharing of calculator will not be permitted in the examination.

Total Marks in Semester-I for Group - A/B = 1100/1125

Total Marks in semester-II for Group -A/B = 1175/1150

Total Marks = 2275

(in B.Tech Ist Year)

2. The course "General Proficiency (GP-102F)" should be evaluated in all the affiliated colleges/institutions by a common format of MDU.

HUM-101F : ESSENTIALS OF COMMUNICATION
B.Tech. Semester-I

L T P		
3 1 0	Class Work	50 Marks
	Exam	100 Marks
	Total	150 Marks
	Duration of Exam 3 Hrs.	

Notes :

Examiner will set 9 questions in total, two questions from each section and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total, selecting at least one question from each session.

Section-A

Semantics : A selected list of synonyms, Antonyms, Homophones and Homonyms. Form and function of words.

Syntax : Sentence structures, Verb patterns and their usage.

Section-B

Phonetics : Basic Concepts - Vowels, Consonants, Phonemes, Syllables ; Articulation of Speech Sounds- Place and Manner of Articulation_ Transcription of words and simple sentences, using International.

Comprehension : Listening and Reading comprehension - Note taking, Reviewing, Summarising, Interpreting, Paraphrasing and Precis Writing.

Section-C

Composition : Descriptive, Explanatory, Analytical and Argumentative Writing- description of simple objects like instruments, appliances, places, persons, principles, description and explanation of processes and operations; analysis and arguments in the form of debate and group discussion.

Section-D

Text : English for Students of Science by A.Roy and P.L. Sharma (Orient Longman)

<u>Chapters for Study :</u>

(i)   "The year 2050" by Theodore J. Gorden

(ii)   "The mushroom of Death" by A Bandhopadhyay.

(iii)   Human Environment by Indira Gandhi.

(iv)   Experiment and Experience by W.R. Niblett.

The prescribed text will be used as a case study for various components of the syllabus.

(For Internal Evaluation Only).

Book Review - Herein the students will be required to read and submit a review of a book (Literary or non-literary) of their own choice. This will be followed by a presentation of the same in the class.

Text Books :

1.   English for Students of Science edited by A. Roy and Shama. Orient Longman.

2.   Spoken English for India by R.K. Bansal and J.B. Harrison Orient Longman.

3.   Intermediate Grammar, Usage and Composition by M.L. Tickoo and A.E. Subramaniam, Orient Longman.

Note : It is suggested that a workbook may be introduced for units I, II and III.

Suggested Reading :

1.   English Grammar, Compitition and Correspondence by M.A. Pink and S.E. Thomas, S. Chand and Sons Pvt. Ltd. Delhi.

2.   A Practical English Grammar by Thomson and Martinet, OUP, Delhi.

3.   Guide to Patterns and Usage in English by A.S. Hoenby, OUP, Delhi.

4.   A Textbook of English Phonetics for Indian Students by T. Balasubramanian, MacMillan, Chennai.

5.   Communication English by Sadhna Gupta.

6.   Better English Pronunciation by J.D.O'Connor, Cambridge Univ. Press, London.

7.   English Vocabulary in Use by McCarthy, Foundation Books (Cambridge University Press), Delhi.

8.   Assessing Listening by Buck, Foundation Books (Cambridge University Press), Delhi.

9.   Reading Between the Lines by McRae, Foundation Books (Cambridge University Press), Delhi.

HUM-101F : MATHEMATICS-I

L T P	Class Work	50 Marks
3 1 0	Exam	100 Marks
	Total	150 Marks
	Duration of Exam 3 Hrs.	

Notes :

Examiner will set 9 questions in total, two questions from each section and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total, selecting at least one question from each session.   **Section-A**

Infinite series : Convergence and divergence, comparison tests, D' Alembert's ratio test, integral test, Raabe's test, logarithmic and Cauchy root tests, Gauss's test, alternating series, absolute and conditional convergence.

Section-B

Matrices & Its Application : Rank of a matrix, elementary transformations, elementary matrices, inverse using elementary transformations, normal form of a matrix, linear dependence and independence of vectors, consistency of linear system of equations, linear and orthogonal transformations, eigenvalues and eigenvectors, properties of eigenvalues, Cayley- Hamilton theorem and its applications, diagonalization of matrices, similar matrices, quadratic forms.

Section-C

Differential Calculus : Successive differentiation, Leibnitz theorem and applications, Taylor's and Maclaurin's series, curvature, asymptotes, curve tracing. Functions of two or more variables, limit and continuity, partial derivatives, total differential and differentiability, derivatives of composite and implicit functions, jacobians, higher order partial derivatives, homogeneous functions, Euler's Theorem and applications. Taylor's series for functions of two variables (without proof), maxima-minima of function of two variables. Lagrange's method of undetermined multipilers, differentiation under integral sign (Leibnitz rule).

Section-D

Integral Calculus : Beta and gamma functions and relationship between them. Applications of single integration to find volume of solids and surface area of solids of revolution. Double integral, change of order of integration, double integral in polar coordinates, applications of double integral to find area enclosed by plane curves, triple integral, change of variables, volume of solids, Dirichlet's integral.

Text Books :

1. Advanced Engineering Mathematics : E. Kreyszing

2. Calculus and Analytic Geometry : G.B. Thomas, R.L. Finney

3. Higher Engineering Mathematics : B.S. Grewal

4. Higher Engineering Mathematics : B.V. Ramana

5. A Text Book of Engineering Mathematics by NP Bali

Reference Books :

1. Differential and Integral Calculus ; Piskunov

2. Advanced Engineering Mathematics : Jain and Lyenger

3. Advanced Engg. Mathematics : Michael D. Greenberg

PHY-101F : PHYSICS-I

L T P			
3 1 0	Class Work	50 Marks
	Exam	100 Marks
	Total	150 Marks
	Duration of Exam 3 Hrs.	

Notes :

Examiner will set 9 questions in total, two questions from each section and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total, selecting at least one question from each session.

Section-A

Interference : Coherent sources, conditions for sustained interference. Division of Wave-Front, Fresnel's Biprism , Division of Amplitude- Wedge-shaped film, Newton's Rings, Michelson Interferometer, applications (Resolution of closely spaced spectral lines, determination of wavelengths).

Diffraction : Difference between interference and diffraction Fraunhofer and Fresnel diffraction. Fraunhofer diffraction through a single slit, Plane transmission diffraction grating, absent spectra,

dispersive power, resolving power and Rayleigh criterion of resolution.

Section-B

Polarisation : Polarised and unpolarised light. Uniaxial crystals double refraction, Nicol prism, quarter and half wave plates, Detection and Production of different types of polarized light, Polarimetry; Optical and specific rotation, Biquartz and Laurent's hald shade polarimeter.

Laser

Spontaneous and stimulated emission, Laser action, characteristics of laser beam-concept of coherence, spatial and temporal coherence. He-Ne and semiconductor lasers (simple ideas). applications.

Section-C

Fibre Optics

Propagation of light in optical fibres, numerical aperture, V-number, single and multimode fibres, attenuation dispersion, applications.

Dielectrics

Molecular theory, polarization, displacement vector, electric susceptibility, dielectric coeficient, permitivity & various relations between these, Gauss's law in the presence of a dielectric, Energry stared in a uniform electric field, concept of local molecular fields and Claussius Mossotti relation.

Section-D

Special Theory of Relativity

Michelson's Marley Experiment, Postultes of special theory of relativity, Lorentz transformations. Consequences of LT (length contraction and time dilation). addition of velocities, variation of mass with velocity, mass energy equivalence.

Super Conductivity

Introduction (Experimental survey), Meissner effect, London equations, Hard and Soft supercondictors, Elements of BCS Theory.

Text Books :

1. Perspectives of Modern Physics - Arthur Beiser (TMH)
2. Optics - Ajoy Ghatak (TMH)
3. Modern Physics for Engineers- S.P. Taneja (R. Chand)
4. Engineering Physics- SatyaPrakash (Pragati Prakashan)
5. Modern Engineering Physics- A.S. Vasudeva (S. Chand)

Reference Books :

1. Fundamentals of Physics- Resnick & Halliday (Asian Book)
2. Introduction to Electrodynamics- D.J. Griffith (Prentice Hall)

ECE-101F : BASIC OF ELECTRONICS

L T P		Class Work	50 Marks
3 0 0		Exam	100 Marks
		Total	150 Marks
		Duration of Exam 3 Hrs.	

Notes :

Examiner will set 9 questions in total, two questions from each section and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total, selecting at least one question from each session.

Section-A

Semiconductor Physics : Basic concepts, Intrinsic and extrinsic semiconductors, diffusion and drift currents, p-n junction under open-circuit, reverse bias and forward-bias conditions, p-n junction in the breakdown region, Ideal diode, terminal characteristics of junction diode.

Amplifiers : Introduction of different types of amplifiers and their

characteristics, Principle of amplifition, Frequency response of RC coupled amplifiers, bandwith and Concept of Cascaded Amplifiers, Feedback amplifiers, Effect of positive and negative feedback on amplifier gain and bandwidth.

Section-B

Oscillators : Criteria for oscillations, Qualitative analysis of LC, RC and Crystal Oscillators, Study of Wein Bridge Oscillators.

Operational Amplifiers : Op-amps, its characteristics and its applications.

Power Suppliers : Introduction and Working of Switched Mode Power Supply (SMPS), Voltage Regulator, Introduction to Inverters and UPS.

Section-C

Digital Electronics : Binary, Octal and Hexadecimal number system and conversions, Boolean Algebra, Truth tables of logic gates (AND, OR, NOT) NAND, NOR as universal gates, Difference between combinational circuits and sequential circuits, Introduction to flip-flops (S-R & J-K).

Electronics Intruments : Role, importance and applications of genera;-purpose test instruments viz Multimeter Digital & Analog, Cathode Ray Oscilloscope (CRO), Function/Signal Generator.

Section-D

Display : Seven segment display, Fourteen segment display, Dot matrix display

LED Display : Introduction, Construction, Advantage of LEDs in electronics display

LCD Display : Introduction, Types of LCD display- Dynamic scattering and field effect type; Types of liquid crystal cells :- Transmitting type and reflective type; Advantage and disadvantage of LCD display

common applications.

Book Recommended

1. Sedra A S and Smith K C, "Microelectronic Circuits" 4th Ed., New York, Oxford University Press, New York (1997).

2. Tocci R J and Widmer N S, "Digital Systems - Principles and Applications", 8th Ed., Pearson Education India, New Delhi (2001).

3. Cooper and Helfrick, "Modern Electronic Instrumentation and Measuring Techniques", 4th print Prentice Hall of India, New Delhi (1996).

4. Boylestad and Nashelsky, "Electronic Devices and Circuit Theory", 8th Ed., Pearson Education India, New Delhi (2002).

5. Millman and Grabel, "Microelectronics", 2nd Ed., Tata McGraw-Hill (1999).

6. Bhargava-Basic Electronics & Linear Circuits, TMH.

CH-101F : ENGINEERING CHEMISTRY

L T P		Class Work	50 Marks
3 1 0		Exam	100 Marks
		Total	150 Marks
		Duration of Exam 3 Hrs.	

Notes :

Examiner will set 9 questions in total, two questions from each section and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total, selecting at least one question from each session.

SECTION A

Phase Rule:-Terminology, One component system (H_2O system and CO_2 - system), two components system, Simple eutectic system (Pb-Ag), system with congruent melting point (Zn - Mg), system with incongruent melting point (Na_2SO_4 - H_2O),Cooling curves.

Catalysis: Characteristics of catalytic Reactions, Types of catalysis: Homogeneous catalysis, Heterogeneous catalysis, Autocatalysis and Induced catalysis. Mechanism of Catalytic action (Intermediate compound formation theory & Adsorption theory). Concept of promoters, inhibitors and poisioners. Enzymatic catalysis: its characteristics, factors affecting, Mechanism (lock and key hypothesis and Induced fit hypothesis)

SECTION B

Water and its Treatment: Part-I: Sources of water, impurities in water, hardness of water and its determination(EDTA method), Units of hardness, alkalinity of water and its determination, related numerical problems, scale and sludge formation (composition properties and methods of prevention) Boiler corrosion and caustic embrittlement.Priming and foaming

Water and its Treatment: PART II: Treatment of water for domestic use, coagulation, sedimentation, filtration and disinfection. water softening : Lime-Soda treatment, Zeolite, Ion - exchange process, mixed bed demineralization, Desalination (Reverse Osmosis , electro dialysis) & related numericals.

SECTION C

Corrosion and its prevention: Mechanism of Dry and wet corrosion (rusting of iron), types of corrosion, galvanic corrosion, differential aeration corrosion, stress corrosion. Factors affecting corrosion, preventive measures (proper design, Cathodic and Anodic protection, Electroplating, tinning, galvanization.), Soil Corrosion, Microbiological Corrosion.

Lubrication and Lubricants: Introduction, mechanism of lubrication, classification of lubricants, (Liquid, Grease (semi - solid) and solid (MoS_2, Graphite). Additives for lubricants. Properties of lubricants (Flash & Fire point, Saponification number, Iodine value, Acid value, Viscosity and Viscosity index Aniline point, Cloud point and pour point) Numerical problems based of viscosity Index. Biodegradable lubricants.

SECTION D

Polymers and polymerization: Introduction & Classification of polymers mechanism of polymerization (Addition, condensation and co- ordination) effect of structure on properties of polymers, Bio polymerization, Bio

degradable polymerization, preparation properties and technical application of thermo - plastics (PVC, PVA, Teflon)& thermosetting(PF,UF), Natural elastomers and synthetic rubber (SBR,GR -N) . Silicones, Introduction to polymeric composites.

Instrumental Methods of Analysis: Principle and application of Thermal methods of Analysis. (TGA, DTA, DSC), Basic concepts of spectroscopy, Lambert and Beers law, Absorption and Emission spectroscopy Different spectroscopic Techniques (UV- Visible and IR spectroscopy) elementary discussion on Flame photometry.

Text Books:-

1. Engineering Chemistry , P.C. Jain Monica Jain (Dhanpat Rai & Co)

2. Chemistry in Engineering & Tech , Vol. I & II, Kuriacose (TMH)

3. Chemistry for Engineers, Dr. B.K. Ambasta, (University Science Press)

Reference Bankbooks:-

1. Instrumental methods of Chemical analysis, MERITT & WILLARD (EAST - WEST press)

2. Physical Chemistry, P.W Atkin (ELBS, OXFORD Press)

3. Physical Chemistry W.J.Moore (Orient Longman)

CSE-101F : FUNDAMENTAL OF COMPUTERS & PROGRAMMING IN C

L T P		
3 1 0	Class Work	50 Marks
	Exam	100 Marks
	Total	150 Marks
	Duration of Exam	3 Hrs.

Notes :

Examiner will set 9 questions in total, two questions from each section and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total, selecting at least one question from each session.

Section-A

An Overview of Computer System and Operating Systems :

Fundamentals :- Evaluation of Computers, Hardware organization of a computer, Introduction to microprocessor, generations of microprocessors, Commonly used CPUs. Input/Output devices, Input/Output ports and connectors.

Operating System Basics : Introduction to Operating system, Functions of an Operating system, Classifiction of Operating Systems, Basic introduction to DOS, UNIX/LINUX OS, Windows XP.

Section-B

Basic Introduction to System Software and Programs :

Machine Language, Assembly Language, Low level languages, High level Languages, Types of high level languages, Complier, Interpreter, Assembler, Loader, Linker, Relationship between Complier, Interpreter, Loader and Linker.

Basic Introduction to Computer Networks :-

Data Communication, modulation, Network devices, LAN, MAN topologies, WAN, OSI Reference model, Introduction to Internet and protocols : TCP/ IP Reference model. Backbone network, Network connecting devices, Hypertext documents, HTTP, DNS, Network Security.

Section-C

An Overview of C :

Constants, Variables and Data types, operators and Expressions, managing I/O operations. Decision Making and branching. Decision Making and looping, Arrays, Character Arrays and Strings, User Defined Functions.

Structure and Union in C :

Defining structure, declaring variables, Accessing structure members, structure initialization, copying and comparing structure variables, operations on individual members, Array of structure, structure with structure, unions, size of structure.

Section-D

Pointers in C :

Introduction, Understanding Pointers, Accessing the address of a variable, Deciaring Pointer variables, initialization of Poiner variables, Accessing a variable through its pointer, Chain of pointers, Pointer Expressions, Pointer increments and scale Factors, pointer and Arrays, Pointer and Character Strings. Arrays of Pointer, Pointers as Function Arguments, Functions Returning Pointers, Pointers to Functions.

Dynamic Memory Allocation and File Management in C :

Introductoin, Dynamic memory allocation, allocating a block of memory : Malloc, allocating multiple blocks of memory : Calloc, Releasing the used space : Free, Altering the size of Block ; Realloc, Defining and opening file, closing file, I/O operation on files, error handling during I/O operations, Random Access to files and command line arguments.

Text Books :

1. Fundamental of Computers and Programming with C, by A.K.

Sharma, Dhanpat Rai Publications, New Delhi.

2. Computing Fundamentals and Programming in C by Nasib Singh Gill, Khanna Book Publishing Co (p) Ltd

3. Computer Networks (4th Edition), by Andrew S. Tanenbaum.

4. Essential of Computer & Network Technology by N S Gill, Khana book Publication.

Reference Books :

1. ANSI C, by Dennis Ritchi

2. Programming in C, by Lipschutz, SCHAUM SERIES OUTLINES

3. Operating System Concepts, (6th Edition). by Abraham Silbershatz, Peter Baer Galvin, Greg Gagne.

4. Balagurusamy-Programming in ANSI C.

EE-101F : ELECTRIC TECHNOLOGY

L T P   Class Work   50 Marks

3 1 0   Exam   100 Marks

     Total   150 Marks

     Duration of Exam 3 Hrs.

Notes :

Examiner will set 9 questions in total, two questions from each section and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total, selecting at least one question from each session.

Section-A

D.C. Network Laws and Theorems :

a) Ohm's Law, Kirchoff's Laws, Nodal and Loop methods of analysis, Star to Delta & Delta to Star transformation.

b) Thevenin's theorem, Norton's theorem, superposition theorem, maximum power transfer theorem, Milman's theorem.

Section-B

Single Phase A.C. Circuits :

a) Sinusoidal signal, instantaneous and peak values, RMS and average values, crest and peak factor, Concept of phase, representation-polar & rectangular, exponential and trigonometric forms, behaviors of R,L and C components in A.C. circuits.

b) Series and Paralle A.C. circuits. Concept of active and reactive power, power factor, series and parallel reasonance, Q factor, cut-off frequencies and bandwidth.

Section-C

Three Phase A.C. Circuits :

Phase and line voltage and currents, balanced star and circuits, power equation, measurement of power by two wattmeter method, introduction to unbalanced circuits.

Transformers :

Construction, EMF equation, ideal transformer, Phasor diagram on no load and full load, equivalent circuit, losses, regulation and efficiency, open and short circuit test.

Section-D

Electrical Machines :

Construction, Principle, working E.M.F. equation and losses of D.C. machine, comparison of construction and working of D.C. machine with induction motor and synchronous machine application of DC machines.

Measuring Instrumets :

Construction, operating and uses of moving iron type and moving coil type, induction type voltmeter, Ammeter, watt meter, energy meter.

Text Books :

1. Basic Electric Engg (2nd Edition) : Kothari, TMH

2. Electrical Technology (Vol-I, Vol-II) B.L. Theraja & A K Theraja, S. Chand

Reference Books :

1. Electrical Engineering Fundamentals : Deltoro, PHI

2. NEtwork Abnalysis ; Valkenburg, PHI

3. Electrical and Electronic Technology (8th Edition) : Hughes, Pearson.

4. Electrical Technology By R K Rajput.

ME-101F : BASICS OF MECHANICAL ENGG.

L T P		
	Class Work	50 Marks
3 1 0	Exam	100 Marks
	Total	150 Marks
	Duration of Exam 3 Hrs.	

Notes :

Examiner will set 9 questions in total, two questions from each section and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total, selecting at least one question from each session.

Section-A

Introduction to Commonly used Machine Tools in a Workshop : Lathe, Shaper, Planer, Milling, Drilling, Slotter, Introduction to Metal Cutting.

Basic concept of thermodynamics

Introduction, States, Work, Heat, Temperature, Zeroth, 1st, 2nd and 3rd law of thermodynamics, Concept of internal energy, enthalpy and entropy, Problems.

Properties of Steam & Steam Generator

Formation of steam under constant pressure, Thermodynamic

properties of steam, use of steam tables, measurement of dryness fraction by throttling calorimeter.

Section-B

Refrigeration & Airconditioning

Introduction to refrigeration and air-conditioning, Rating of refrigeration machines, Coefficient of performance, simple refrigeration vapour compression cycle, Psychrometric charts and its use, Human comforts.

Hydraulic Turbines & Pumps :

Introduction, Classification, Construction details and working of Pelton, Francis and Kaplan turbines, Specific speed and selection of turbines, Classification of water pumps and their working.

Section-C

Power Transmission Methods and Devices :

Introduction to Power transmission, Belt, Rope, Chain and Gear drive, Types and functioning of clutches.

Stresses and Strains :

Introduction , Concept & types of stresses and strains, Poison's ratio, stresses and strains in simple and compound bars under axial loading, flexure & torsional loading, Stress-strain diagrams. Hook's law, Elastic constants & their relationships.

Section-D

Introduction to Manufacturing Systems, Fundamentals of Numerical Control (NC). Advantage of NC systems, Classifications of NC, Comparison of NC and CNC.

Text Books :

1. Elements of Mechanical Engineering- R.K. Rajput LAkmi Pub., Delhi.

2. Elements of Mechanical Engineering- D.S. Kumar, S.K. Kataria and Sons

3.   Engineering Thermodynamics - P.K. Nag TMH, New Delhi.

4.   Refrigeration & Airconditioning- Arora & Domkundwar, Dhanpat rai & Co. Pvt. Ltd.

5.   Worshop Technology Volt. I & II - Hazra & Chaudhary, Asian Book Comp., New Delhi.

6.   Process and Materials of Manufacture- Lindberg, R.A. Prentice Hall of India, New Delhi.

7.   Principles of Manufacturing Materials and Processes- Compbell, J.S. - McGraw Hill.

Reference Books :

1.   Strength of Materials- Popov, Pub. - PHI, New Delhi.

2.   Hydraulic Machines- Jagdish Lal, Pub. Metropolitan, Allahabad.

3.   Strength of Materials- G.H. Ryder, Pub. ELBS.

4.   Hydraulic and Fluid Mechanics- Modi and Seth, Pub.- Standara Book House, New Delhi.

5.   Engineering Thermodynamics- C.P. Arora, Pub. - TMH, New Delhi.

6.   Refrigeration & Airconditioning- C.P. Arora, Pub. -TMH, New Delhi.

7.   Manufacturing Science- Amitabha Ghosh & Ashok Kumar Malik, East-West Press.

8.   Manufacturing Process and Systems- Ostwaid, Munoz, John Wiley.

9.   Workshop Technology, Vol. 1, 2, & 3- Chapman, WAJ Edward Amold.

ME-103F : ENGINEERING GRAPHICS & DRAWING

L T P		
3 1 0	Class Work	50 Marks
	Exam	100 Marks
	Total	150 Marks
	Duration of Exam 4 Hrs.	

Notes :

Examiner will set 9 questions in total, two questions from each section and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total, selecting at least one question from each session.

Section-A

Protection of Points, Straight Lines and Planes

Introduction, Various types of projections, first and third angle systems of orthographic projections, types and use of lines and lettering. Dimensioning, Projection of points in different quadrants, projections of lines and planes for parallel, perpendicular & inclined to horizontal and vertical reference planes.

Projections Solids and Development of Surfaces

Cylinder, Cone, Pyramid & Sphere with axes parallel, perpendicular & inclined to both reference planes, Development of surfaces of various solids.

Section-B

Sections of Solids

Section planes, Sectional views, True shape of Sections for Prism, Cylinder, Pyramid, Cone & Sphere.

Orthographic Projections

Simple objects and simple Machine Components like Bolts and Screw.

Section-C

Isometric Projections

Isometric scales, Isometric views of Simple objects.

Introduction to computer-aided drafting (CAD) :

Cartesian and Polar Co-ordinate system, Absolute and Relative Co-ordinates systems : Basic Commands : Line, Point, Rectangle, Polygon, Circle, Arc, Elipse, Polyline : Basic editing Commands : Basic Object Selection Methods, Window and Crossing Window Erase, Move, Copy, Offset, Fillet, Chamfer, Trim, Extend, Mirror : Display Commands : Zoom, Pan, Redraw, and Regenerate : Simple dimensioning and text, simple exercises.

Section-D

Solid modeling :

Basics of 2-D and 3-D solid modeling, orthographic, iso-metric projection drawing and sectional views of simple machine elements.

Text Book

1. Enginering Drawing Plane and Solid Geometry : N.D. Bhatt and V.M. Panchal, Forty-Fourth Edition 2002, Charotar Publishing House.

2. Engineering Drawing : Laxmi Narayan and Vaishwanar, Charotar Publishing House.

3. Engineering Graphics and Drafting : P.S. Gill, Milenium Edition, S.K. Kataria and Sons.

4. Engineering Graphics using AUTOCAD 2007 : T. Jeyapoovan,m First Edition 2002, Vikas Publishing House.

Reference Books :

1. A Text Book of Engineering Drawing : S.B. Mathur, Second Revised and Enlarged Edition 2000, Vikas Publishing House.

2. Autocad 2008 instructor : James A Leach, TMH New Delhi.

3. Jolhe Engineering Drawing 2008, TMH New Delhi.

PHY-103F : PHYSICS-I LAB

L T P	Class Work	25 Marks
0 0 2	Exam	25 Marks
	Total	50 Marks
	Duration of Exam 3 Hrs.	

Notes :

(i)   The experiments in 1st semester will be based mainly upon Optics, Electrastatics, Wave and Oscillations which are the parts of the theory syllabus of 1st semester.

(ii)   Students will be required to perform atleast 10 experiments out of the list.

List of Experiments

1. To find he wavelength of sodium light by Newton's rings experiment.

2. To find the wavelength of sodium light by Fresnel's biprism experiment.

3. To find the wavelength of various colours of white light with the help of a plane transmission diffraction grating.

4. To find the refractive index and cauchey;s constants of a prism by using spectrometer.

5. To find the wavelength of sodim light by Michelson Interferometer.

6. To find the resolving power of a telescope.

7. To find the pitch of a screw using He-Ne laser

8. To find the specific rotation of sugar solution by using a

polarimeter.

9.   To compare the capacitances of two capacitors by De'sauty bridge and hence to find the dielectric constant of a medium.

10.   To find the flashing and quenching potentials of Argon and also to find the capacitance of unknown capacitor.

11.   To study the photoconducting cell and hence to verity the inverse square law.

12.   To find the temperature co-efficient of resistance by using platinum resistance thermometer and Callender and Griffin bridge.

13.   To find the frequency of A.C., mains by using sonometer.

14.   To find the velocity of ultrasonic waves in non-conducting medium by piezo-electric method.

Recommended Books :

1.   Advanced Practical Physics - B.L. Workshop and H.T. Flint (KPH)

2.   Practical Physics - S.L. Gupta & V. Kumar (Pragati Prakashan).

3.   Advanced Practical Physics Vol. I & II- Chauhan & Singh (Pragati Prakashan).

CSE-103F : FCPC LAB.

L T P		
0 0 2	Class Work	25 Marks
	Exam	25 Marks
	Total	50 Marks
	Duration of Exam 3 Hrs.	

Important Note :

In addition to the experiments listed below, 5 to 10 more lab-exercises may be given by the teacher concerned to the students for practice depending upon the progress of the students in programming capabilities. It is suggested (not mandatory) that the institute concerned may allot more number of teacher can give more and more emphasis on this FCPC-Lab Course so that the teacher can give more and more emphasis on "personal eye-to-eye attention" in the lab to each and every student so that the students can truly lean How to write correct and effiicient code independently with their self-confidence. Building this confidence in the students is more important to the teachers than the number-statistics i.e. "the **Total Number** of experiments" finished/done by the students in this FCPC Lab.

The Lab Teacher/Technician will introduce (show) the students in the lab the different Hardware organization of a computer. Input/Output devices. Input/Output parts and connectors etc. on the very first day before the start of the following experiments.

Samples (types) of the programming problems to be practiced :-

1.   Write a program to find the largest of three numbers. (if-then-else)

2.   Write a program to find the largest of ten numbers. (for statement)

3.   Write a program to find the average mail height & average female heights in the class (input is in the form of sex code, height).

4.   Write a program to find roots of a quadratic equation using functions and switch statements.

5.   Write a program using arrays to find the largest and second largest number out of given 50 numbers.

6.   Write a program to multiply two matrices.

7.   Write a program to read a string and write it in reverse order.

8.   Write a program to concatenate two strings of different lengths.

9.   Represent a deck of playing cards using arrays.

10. Write a program to check that the input string is a palindrome or not.

11. Programs on file handling.

EC-103F : ELECTRICAL TECHNOLOGY LAB

L T P		Class Work	25 Marks
0 0 2		Exam	25 Marks
		Total	50 Marks
		Duration of Exam	3 Hrs.

Notes :

(i) At least 10 experiments are to be performed by students in the semester.

(ii) At least 7 experiments should be performed from the above list, remaining three experiments may either be performed from the above list or designed and set by the concerned institution as per the scope of the syllabus of EE-101-E.

List of Experiments

1. To verify KCL and KVL.

2. To verify Thevenin's and Norton theorem

3. To verify Maximum power transfer theorem in A.C. and D.C.

4. To verify Superposition theorem.

5. To study frequency response of a series R-L-C circuit and determine resonant frequency and Q-factor for various values of R.L.C.

7. To perform direct load test of a transformer and plot efficiency Vs load characteristic.

8. To perform direct load test of a D.C. shunt generator and plot load voltage Vs load current curve.

9. To perform O.C. and S.C. tests of a transformer.

10. To study various type of meters.

11. Measurement of power by 3 voltmeter/3 Ammeter method.

12. Measurement of power in a 3-phase system by two waltmeter method.

ECE-103F : BASIC OF ELECTRONICS LAB   [002]

1. To get familiar with the working knowledge of the following instruments :
   a) Cathode ray oscilloscope (CRO)
   b) Multimeter (Analog and Digital
   c) Function generator
   d) Power supply

2. a) To measure phase difference between two waveforms using CRO
   b) To measure an unknown frequency from Lissajous figures using CRO

3. a) Plot the forward and reverse V-I characteristics of P-N junction diode
   b) Calculation of cut-in voltage
   c) Study of Zener diode in breakdown region

4. To plot and study the input and output characteristics of BJT in common-emitter configuration.

5. To find frequency response of a given amplifier and calculate its bandwidth.

6. To get familiar with pin-configuration of typical op-amp (741)

and its use as :

a) Inverting amplifier

b) Non-inverting amplifier

c) Summing amplifier

d) Difference amplifier

7. Use of op-amp as

a) Integrator

b) Differentiator

8. To assemble Wein Bridge oscillator circuit and calculation of oscillation-frequency and its verification from the observed output.

9. To assemble and test 5V/9 V DC regulated power supply and find its line-regulation and loand-regulation.

10. Verification of truth tables of logic gates (OR, AND, NOT, NAND, NOR)

11. Verification of truth tables of flip-flops (S-R, J-K)

12. To get familiar with the working and use of seven-segment display.

CH-103F : ENGINEERING CHEMISTRY LAB

L T P		
0 0 2	Class Work	25 Marks
	Exam	25 Marks
	Total	50 Marks
	Duration of Exam 3 Hrs.	

List of Experiments

1. Determination of Ca++ and Mg++ hardness of water using EDTA solution.

2. Determination of alkalinity of water sample.

3. Determination of dissolved oxygen (DO) in the given water sample.

4. To find the eutectic point for a two component system by using method of cooling curve.

5. Determination of viscosity of lubricant by Red Wood Viscosity (No. 1 & No.2)

6. To determine flash point & fire point of an oil by Pensky Marten's flash point apparatus.

7. To prepare Phenol- formaldehyde and Urea formaldehyde resin.

8. To find out saponification No of Oil.

9. To determination TDS of water samples of different sources.

10. Determination of concentration of $KMnO_4$ solution spectrophotomererically.

11. Determination of strength of HCl solution by titrating against NaOH solution conductometerically.

12. To determine amount of sodium and potassium in a, given water sample by flame photometer.

13. Estimation of total iron in an iron alloy.

Note : At least ten experiments are to be performed by students.

Sugested Books :

1. Any text Book on Experimental and Calculation, Engineering Chemistry

ME-107F : BASIC OF MECHANICAL ENGINEERING LAB

L T P		
0 0 2	Sessional	25 Marks
	Exam	25 Marks
	Total	50 Marks

Notes :

(i)   At least tem experiments are to be performed in the semester.

(ii)   At least seven experiments should be performed from the above list. Remaining three experiments may either be performed from the above list or as designed and set by the concerned institute as per the scope of the syllabus.

List of Experiments

1.   To study the Cochran and Badcock & Wilcox boilers.

2.   To study the working and function of mountlings and accessories in boilers.

3.   To study Two-stroke & Four-Stroke Diesel Engines.

4.   To study Two-stroke & Four-Stroke Petrol Engines.

5.   To study the vapor compression Refrigeration System and determination of its C.O.P.

6.   To study the functioning of Window Room Air Conditioner.

7.   To study the constructional features and working of peiton wheel Turbine, Francis Turbine and Kaplan Turbine.

8.   To calculate the Mechanical Advantage, Velocity Ratio and Efficiency of single start, Double start and Triple start worm & Worm Wheel.

9.   To calculate Mechanical Advantage, Velocity Ratio and Efficiency of single purchase and Double puprchase winch crab and plot graphs.

10.   To find the percentage error between observed and calculated values of stresses in the member of a Jib Crane.

11.   To study simple screw jack and compound screw jack and determine their efficiency.

12.   To find the Mechanical Advantage, velocity Ratio and Efficiency of a Differential Wheel and Axle.

13.   To perform tensile test, plot the stress-strain diagram and evaluate the tensile properties of a given metallic specimen.

ME-105F : WORKSHOP TECHNOLOGY

L T P		Class Work	50 Marks
2 0 2		Exam	25 Marks
		Total	75 Marks
		Duration of Exam 3 Hrs.	

Notes :

(i)   At least ten experiments/jobs are to be performed/prepared by the students in the semester.

(ii)   At least 8 experiments/job should be performed/prepared from the above list, remaining two may either be performed/prepared from the above list or designed & set by the concerned institution as per the scope of the syllabus of the 'Manufacturing Processes' as mentioned below.

Manufacturing Processes :

Introduction to Manufacturing Processes and their Classification, Industrial Safety; Introduction, Types of Accidents, Causes and Common Sources of Accident, Methods of Safety, First Aid, Objectives of Layout, Types of Plant Layout and their Advantages.

Foundry, Forming and Welding :

Foundry : Introduction to Casting Processes, Basic Steps in Casting Processes, Pattern : Types of Pattern and Allowances, Sand Casting : Sand Properties, Constituents and Preparation. Mould & Core Making with assembly and its Types. Gating System. Melting of Metal, Furnaces and Cupola, Metal Pouring, Fetling, Casting Treatment, Inspection and Quality Control, Sand Casting Defects & Remedies.

Forming Processes : Basic Principle of Hot & Cold Working, Hot & Cold Working Processes, Rolling, Extrusion, Forging, Drawing, Wire Drawing and Spinning, Sheet Metal Operations : Measuring Layout marking, Shearing, Punching, Blanking, Piercing, Forming, Bending and Joining.

Welding : Introduction to welding, Classifiation of Welding Processes, GAS Welding : Oxy-Acetylene Welding, Resistance Welding : Spot and Seam Welding, Arc Welding : Metal Arc, TIG & MIG Welding Defects and Remedies, Soldering & Brazing.

List of Experiments/ Jobs

1. To study different types of measuring tools used in metrology and determine least counts of vernier calipers, micrometers and vernier height gauges.

2. To study different types of machine tools (lathe, shape or planer of slotter, milling, drilling machines)

3. To prepare a job on a lathe involving facing, outside turning, taper turning, step turning, radius making and parting-off.

4. To study different types of fitting tools and marking tools used in fitting practice.

5. To prepare lay out on a metal sheet by making and prepare rectangular tray pipe shaped components e.g. funnel.

6. To prepare joints for welding suitable for bull welding and lap welding.

7. To perform pipe welding.

8. To study various types of carpentry tools and prepare simple types of at least two wooden joints.

9. To prepare simple engineering components/shapes by forging.

10. To prepare mold and core assembly to put metal in the modl and fettle the casting.

11. To prepare horizontal surface/vertical surface/curved surface/ slats or V-grooves on a shaper/planner.

12. To prepare a job involving side and face milling on a milling machine.

HUM-102F : COMMUNICATION SKILLS IN ENGLISH

L T P	Class Work	50 Marks
0 0 2	Exam	100 Marks
	Total	150 Marks
	Duration of Exam 3 Hrs.	

Notes :

Examiner will set 9 questions in total, two questions from each section and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total, selecting at least one question from each session.

Section-A

Communicative Grammer : Spotting the errors pertaining to parts of speech, nouns, pronouns, adjective, adverbs, preposition, conjunction, genders, infinitive, participles, form of tenses, use of articles : concord-grammatical concord, notional concord and the principle of proimity between subject and verb and other exceptional usages.

Lexis : Idioms and phrases; Words often confused; One-word Substituted; Foreign Words (A selected list may be includd for all the above components); Formation of words (suffixes, prefixes and detivatives).

Section -B

Oral Communcation :

Part-A: Introduction to principal components of spoken English : Word stress patterns, Intronation, Weak forms in English

Part-B : Developing listening and speaking skills through various activities, such as (a) role play activities, (b) Practising short dialogues (c) Group discssion (d) Debates (c) Speeches (f) Listening to news bulletins (g) Viewing and reviewing T.V. programmes etc.

Section -C

Written Communication :

Developing reading and writing skills through such tasks/activities as developing outlines, key expressions, situations, slogan writing and theme building exercises Reading verbal and non-verbal texts like cartoons, Graphs and tabulated data etc.

Technical Writing :

(a)   Business Letters, Format of Business letters and Business letter writing-Fully-bloked layout may be used.

(b)   E-mail writing

(c)   Reports, Types of Reports and Format of Formal Reports.

(d)   Press Report Writing.

Section-D

(For Internal Evaluation Only) :

Book Review - Herein the students will be required to read and submit a review of a book (Literary or non-literary) of their own choice. This will be followed by a presentation of the same in the class.

Suggested Reading :

1.   Language in Use (Upper intermediate Level, Adrian Doff Christopher Jones, Cambridge University Press

2.   Common Errors in English, Abul Kashem, Ramesh Publishing House, New Delhi.

3.   Objective English, Tata Mc. Graw Hill Publishing Company Ltd., New Delhi.

4.   Spoken English for India, R.K. Bansal & J.B. Harrison, Orient

Longman, Delhi.

5.   The sounds of English, Veena Kumar, Makaav Educational Software, New Delhi.

6.   English Phonetics & Phonology, P. Roach, Cambridge University Press, London.

7.   English for Engineers and Technologists : A Skill Approach. Vol 2, Orient Longman, Delhi.

8.   Business Communication, M.S. Ramesh and C.C. Pattanshetti, R.Chand and Company, Delhi.

9.   Group Discussion, Sudha Publications/Ramesh Publishing House, New Delhi.

10.   Essentials of English Grammar and Composition by N.K. Aggarwal, Goyal Brother Prakashan, Educational Publishers, New Delhi.

11.   Handbook of English grammar and Usage by Mark Lester and Lerry Beasen, Tata Mc Graw-Hill, New Delhi.

12.   Business correspondence and report writing, by R.C. Sharma and Krishna Mohan, Tata Mc Graw Hill Publishing Company Ltd., New Delhi.

BTT-102F : BASICS OF BIOTECHNOLOGY

L T P		Class Work	100 Marks
3 1 0		Exam	50 Marks
		Total	150 Marks
		Duration of Exam 3 Hrs.	

Notes :

Examiner will set 9 questions in total, two questions from each section and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to

attempt 5 questions in total, selecting at least one question from each session.

Section-A

Cell structure and function : Prokaryotes and Eukaryotes : Cell Wall, Membrances, Nucleus, Mitochondria, Cloroplast, Ribosome, Vacuole, Bacteria and viruses : a brief descriptions.

Biomolecules : A brief account of structure of Carbohydrates, Lipids, Proteins.

Cell Division : Mitosis and Miosis.

Section-B

Genes : Classical- brief idea about Mendel's laws and chromosomes, Nature of Genetic material, DNA and RNA, DNA replication.

Gene Expression: Central dogma, genetic code, molecular mechanism on mutations, regulation of gene expression, housekeeping genes, differentiation and development mutations and their molecular basis.

Section-C

Genetic Engineering : an introduction to genetic engineering : Cloning (vectors, enzymes) : DNA and genomic libraries, Transgenics, DNA fingerprinting, Genomics.

Section-D

Development of Biotechnology : Nature and Scope of Biotechnology. Applications of Biotechnology : Bioprocess and fermentation technology, Cell Culture, Enzyme technology, Biological fuel generation, Single cell protein, Sewage Treatment, Environmental Biotechnology, Biotechnology and medicine, Biotechnology in agriculture & forestry indstry, Food and Beverage Technology production of Biological inventions, safety in Biotechnology.

Text/ Reference Books :

1.   Biotechnology, Smith, Cambridge Press.

2.   Modern Concepts of Biotechnology, H.D. Kumar, Vikas Publishing House (P) Ltd.

3.   Elements of Biotechnology, P.K. Gupta, Rastogi Publications.

MATH-102F : MATHEMATICS-II

L T P			
	Class Work	50 Marks
4 1 0	Exam	100 Marks
	Total	150 Marks
	Duration of Exam 3 Hrs.	

Notes :

Examiner will set 9 questions in total, two questions from each section and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total, selecting at least one question from each session.

Section-A

Vector Calculus : Diffrentiation of vectors, scalar and vector point functions. Gradient of a scalar field and directional derivative, divergence and curi of a vector field and their physical interpretations. Integration of vectors, line integral, surface integral, volume integral, Green, Stoke's and Gauss theorems (without proof) and their applications.

Section-B

Ordinary Differential Equations and Applications : Exact differential equations, equations reducible to exact differential equations. Applications of differential equations of first order & first degree to simple electric circuits, Newton's law of cooling, heat flow and orthogonal trajectories, linear diffrential equations of second and higher order. Complete solution, complementary function and particular integral, method of variation of parameters to find particular integral, Cauchy's and Legendre's linear equations. Simultaneous linear

equations with constant co-efficients. Applications of linear differential equations to simple pendulum, oscillatory electric circuits.

Section-C

Laplace Transforms and its Applications : Laplace transforms of elementary functions. Propertries of Laplace transforms, existance conditions, transforms of derivatives, transforms of integrals, multipliatoin by t^n, division by t. Evaluation of integrals by Laplace transforms. Laplace transform of unit step function, unit impulse function and periodic function. Inverse transforms, convolution theorem, applilcation to linear differential equations and simultaneous linear differential equations with constant coefficients and applications to integral equations.

Section-D

Partial Differential Equations and Its Applications : Formation of partial differential equations, Lagrange' linear partial differential equation, first order non-linear partial differential equation, Charpit's method. Method of separation of variables and its applications to wave equation, one dimensional heat equation and two-dimensional heat flow (steady state solutions only).

Text Books :

1. Advanced Engineering Mathematics ; E. Kreyszing

2. Calculus and Analytic Geometry : G.B. Thomas, R.l. Finney

3. Differential and Integral Calculus : Piskunov

4. Higher Engineering Mathematics : B.V. Ramana

5. Higher Engineering Mathematics : B.S. Grewal

6. A Text Book of Engineering Mathematics by N P Bali

Reference Books

1. Advanced Engineering Mathematics : Jain and lyenger

2. Advanced Engg Mathematics : Michael D. Greenberg

PH-102F : PHYSICS- II

L T P		Class Work	50 Marks
3 1 0		Exam	100 Marks
		Total	150 Marks
		Duration of Exam 3 Hrs.	

Notes :

Examiner will set 9 questions in total, two questions from each section and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total, selecting at least one question from each session.

Section-A

Crystal Structure

Space lattice, unit cell and translation vector, Miller indices, simple crystal structure. Laue's treatment to Bragg's law, powder method, point defects in solids- Schottky and Frenkel defects, Bonding in solids-Ionic and covalent bonds.

Quantum Physics

Difficulties with classical physics, introduction to quantum mechanics-simple concepts, Black body radiations Discovery of Planck's constant, phase velocity and group velocity. Schrodinger wave equations-time dependent and time independent, Expectation value, Ehrnfest Theorem, particle in a one-dimensional box. Quantum Statistics (Bose-Einstein and Fermi-Dirac Statistics). Elementary ideas of quark, gluons and hadrons.

Section-B

Nano-Science

Features of nanosystems, concept of quantum size effect, quantum dots and their applications.

Free Electron Theory

Elements of classical free electron theory and its limitations. Drude's theory of conduction, quantum theory of free electrons, Fermi level, density of states, Fermi-Dirac distribution function, Thermionic emission, Richardson's equation.

Section-C

Band Theory of Solids

Origin of energy bonds, Kronig-Penny model (qualitative) E-K diagrams, Brillouin Zones, Concept of effective mass and holes. Classification of solids into metals, semiconductors and insulators. Fermi energy and its variation with temperature. Hall effect and its applications.

Photoconductivity & Photovoltaics

Photoconductivity in insulating crystal, variation with illumination, effect of traps, applicaiton of photoconductivity, photovoltaics cells, solar cell and its characteristics.

Section-D

Megnetic Properties of Solids

Atomic magnetic moments, orbitals diamagnetism, Classical theory of paramagnetism, ferromagnetism, molecular fields and domain hypothesis.

Text Books :

1. Concepts of Modern Physics- Arthur Beiser (TMGH)
2. Solid State Physics- S.O. Pillai (New Age Int. Ltd. Pub.)
3. Modern Physics for Engineers- S.P. Taneja (R. Chand)
4. Engineering Physics- SatyaPrakash (Pragati Prakashan)
5. Modern Engineering Physics - A.S. Vasudeva (S. Chand)

Reference Books :

1. Introduction to Solid State Physics - Kittel (John Wiley)
2. Quantum Mechanics - A. Ghatak
3. A Textbook of Engineering Physics - Avadhanulu and Kshisagar (S. Chand)

ECE-101F : BASICS ELECTRONICS

L T P			
		Sessional	50 Marks
3 0 0		Exam	100 Marks
		Total	150 Marks
		Duration of Exam 3 Hrs.	

Notes :

Examiner will set 9 questions in total, two questions from each section and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total, selecting at least one question from each session.

Section-A

Semiconductor Physics : Basic concepts, Intrinsic and extrinsic semiconductors, diffusion and drift currents, p-n junction under open-circuit, reverse bias and forward-bias conditions, p-n junction in the breakdown region, ideal diode, terminal characteristics of junction diode.

Amoplifiers : Introduction of different types of amplifiers and their charactristics, Principle of amplication, Frequency response of RC coupled amplifiers, amplifier bandwidth and concept of Cascaded Amplifiers, Feedback amplifiers, Effect of positive and negative feedback on amplifier gain and bandwidth.

Section-B

Oscillators : Criteria for oscillations, Qualitative analysis of LC RC and Crystal Oscillators, study of Wein Bridge Oscillators

Operational Amplifiers : Op-amps, its characteristics and its applications.

Power Suppliers : Introduction and Working of Switched Mode Power Supply (SMPS), Voltage Regulator, Introduction to Inverters and UPS.

Section-C

Digital Electronics : Binary, Octal and Hexadecimal number systems and conversions. Boolean Algebra, Truth tables of logic gates (AND, OR, NOT), NAND, NOR as universal gates, Difference between combinational circuits and sequential circuits, Introduction to flip-floops (S-R & J-K). Electronics Instruments : Role, importance and applications of general-purpose test instruments viz Multimeter Digital & Analog, Cathode Ray Oscilloscope (CRO), Function/Signal Generator.

Section-D

Displays : Seven segment display, Fourteen segment display, Dot matrix display

LED Display : Introduction, Construction, Advantage of LEDs in electronics display

LCD Display : Introduction : Types of LCD display :- Dynamic scattering and field effect type; Types of liquid crystal cells : Transmitting type and reflective type : Advantage type; Advantage & disadvantage of LCD display common applications.

Books Recommended :

1. Sedra A S and Smith KC, "Microelectronic Circuits" 4th Ed., New York, Oxford University Press, New York (1997).

2. Tocci R J and Widmer N S, "Digital Systems- Principles and Application", 8th Ed., Pearson Education India, New Delhi,

(2001).

3. Cooper and Helfrick, "Modern Electronic Instrumentation and Measuring Techniques", 4th print Prentice Hall of India, New Delhi (1996)

4. Boylested and Nashelsky, "Electronic Device and Circuit Theory", 8th Ed, Pearson Education India, New Delhi (2002).

5. Millman and Grabel, "Microelectronics", 2nd Ed. Tata McGraw-Hill (1999).

CH-101F : ENGINEERING CHEMISTRY

L T P		
3 1 0	Sessional	50 Marks
	Exam	100 Marks
	Total	150 Marks
	Duration of Exam 3 Hrs.	

Notes :

Examiner will set 9 questions in total, two questions from each section and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total, selecting at least one question from each session.

Section-A

Phase Rule & Catalysis : Terminology, One component system (H_2O system and CO_2- system), two components system, Simple eutectic system (Pb- Ag), system with congruent melting point (Zn- Mg), system with incongruent melting point (Na_2SO_4-H_2O), Cooling curves.

Catalysis : Homogeneous, heterogeneous and enzymatic, Concepts of promotors, inhibitors and poisioners.

Section-B

Water & its treatment : Part-I : Sources of water, hardness of water and its determination, (EDTA method) units of hardness, alkalinity of water and its determination, Related numerical problems, scale and sludge formation (composition properties and methods of prevention) Boiler corrosion & caustic embrittlement.

Water and its treatment : Part- II : Treatment of water for domestic use, coagulation, sedimentation, filtration and disinfection water softening : Lime-Soda treatment, Zeolite, Ion - exchange process, mixed bed demineralization, Desalination (Reverse Osmosis, electro dialysis) & related numericals.

Section-C

Corrosion and its prevention : Mechanism of Dry and wet corrosion (rusting of iron), types of corrosion, galvanic corrosion, differential aeration corrosion, stress corrosion, Factors affecting corrosion, preventive measure (proper design, Cathodic and Anodic protection, Electroplating, tinning, galvanization.), Soil Corrosion, Microbiological Corrosion.

Lubrication and Lubricants : Introduction, mechanism of lubrication, classifiction of lubricants, (Liquid, Grease (semi-solid) and solid (MoS2, Graphite). Additives for lubricants. Properties of lubricants (Flash & Fire point, saponification number, Iodine value, Acid value, Viscosity and Viscosity Index Aniline point, Cloud point and pour point) Numerical problems based of viscosity index. Biodegradable lubricants.

Section-D

Polymers and polymerization : Introduction & Classification of polymers mechanism of polymerization (Addition, condensation and co-ordination) effect of structure on properties of polymers, Bio-polymerization, Bio degradable polymerization, preparation properties and technical application of thermo-plastics (PVC, PVA, Teflon) & thermosets (PF, UF), Natural elastomers and synthetic rubber (SBR,

GR-N), Silicones, Introduction to polymeric composites.

Instrumental methods of Analysis : Principle and application of Thermal methods of Analysis (TGA, DTA, DSC), Basic concepts of spectroscopy, Lambert and Beers law, Absorption and Emission spectroscopy Different spectroscopic Techniques (UV-Visible and IR spectroscopy) elementary discussion on Flame photometry.

Text Book :\

1. Engineering Chemistry, P.C. Jain Monica Jain (Dhanpat Rai & Co)

2. Chemistry in Engineering & Tech, Vol. I & II, Kuriacose (TMH)

Reference BNBooks :

1. Instrumental method of chemical analysis, MERIT & WILLARD (EAST-WEST press)

2. Physical Chemistry, P.W. Atkin, (ELBS, OXFORD press)

3. Physical Chemistry W.J. Moore (Orient Longman)

Section-A

Section-B

Section-C

An Overview of C :

Constants, Variables and Data types, operators and Expressions, managing I/O operations, Decision Making and branching, Decision Making and looping, Arrays, Character Arrays and Strings, user Defined Functions.

Structure and Union in C :

Defining structure, declaring variables, Accessing structure members, structure initialization, copying and comparing structures variables,

operations on individual members, Array of structure, structure with structure, unions, size of structure.

Section-D

Pointers in C :

Introduction, Understanding pointers, Accessing the address of a variable, Declaring Pointer Variables, Initialization of Pointer Variables, Accessing a variable through its pointer, Chain of Pointers, Pointer Expressions, Pointer Increments and Scale Factors, pointer and

Character Strings, Arrays of Pointers, Pointers as Function Arguments, Functions Returning Pointers, Pointers to Functions.

Dynamic Memory Allocation and File Management in C :

Introduction, Dynamic memory allocation, allocating a block of memory : Malloc, allocating multiple blocks of memory : Calloc, Releasing the used space : Free, Altering the size of block : Realloc, Defining and opening file, closing file, I/O operation on files, error handling during I/O operations, Random Access to files and command line arguments.

Text Books :

1. Fundamental of Computers and Programming with C, by A.K. Sharma, Dhanpat Rai Publications, New Delhi.

2. Fundamental of Information Technology, by A.Leon & M.Leon.

3. Computer Network (4th Edition), by Andrew S. Tanenbaum

Reference Books :

1. ANSIC, by Dennis Ritchi

2. Programming in C, by Lipschutz, SCHAUM SERIES OUTLINES

3. Operating System Concepts, (6th Edition), by Abraham Silberschatz, Peter Baer Galvin, Greg Gagne.

EE-101F : ELECTRICAL TECHNOLOGY

L T P	Sessional	50 Marks
3 1 0	Exam	100 Marks
	Total	150 Marks
	Duration of Exam 3 Hrs.	

Notes :

Examiner will set 9 questions in total, two questions from each section and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total, selecting at least one question from each session.

Section-A

D.C. NETWORK LAWS AND THEOREMS :

a) Ohm's Law, Kirchoff's Laws, Nodal and Loop methods of analysis, Star to Delta & Delta to Star transformation.

b) Thevenin's theorem, Norton's theorem, susperposition theorem, maximum power transfer theorem, Milman's theorem

Section-B

SINGLE PHASE A.C. CIRCUITS

a) Sinusoidal signal, instantaneous and peak values, RMS and average values, crest and peak factor, Concept of phase, phasor representation-polar & rectangular, exponential and trigonometric forms, behaviours of R, L and C components in A.C. circuits.

b) Series and Parallel A.C. circuits, Concept of active and reactive power, power factor. Series and Parallel resonance, Q factor, cut-off frequencies and bandwidth.

Section-C

THREE PHASE A.C. CIRCUITS :

Phase and line voltage and currents, balanced star and delta circuits, power equation, measurement of power by two wattmeter method, introduction to unbalanced circuits.

TRANSFORMERS :

Construction, EMF equation, Ideal transformer, Phasor diagram on no load and full load, equivalent circuit, losses, regulation and efficiency, open and short circuit test.

Application of DC machines, Moving Coil Type.

Section-D

ELECTRICAL MACHINES :

Construction, Principle, working, E.M.F. equation and losses of D.C. machine, comparison of construction and working of D.C. machine with Induction motor and sunchronous machine.

MEASURING INSTRUMENTS :

Construction, operation and uses of moving iron type and moving coil type, induction type Voltmeter, Ammeter, Watt meter, Energy meter.

Text Books :

1. Basic Electrical Engg. (2nd Edition) : Kothari & Nagarath, TMH)

2. Electrical Technology (Vol-I) : BL Theraja & AK Theraja, S.Chand

Reference Books :

1. Electrical Engineering Fundamentals : Deltoro, PHI

2. Network Analysis : Valkenburg, PHI

3. Electrical and Electronic Technology (8th edition) : Hughes, Pearson.

ME-101F : BASICS OF MECHANICAL ENGINEERING

L T P		
3 0 0	Sessional	50 Marks
	Exam	100 Marks
	Total	150 Marks
	Duration of Exam 3 Hrs.	

Notes :

Examiner will set 9 questions in total, two questions from each section and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total, selecting at least one question from each session.

Section-A

Introduction to Machine Tool to Commonly used Machine Tools in a Workshop : Lathe, Shaper, Planer, Milling, Drilling, Slotter, Introduction to Metal cutting.

Basic concept of thermodynamics

Introduction, States, Work, Heat, Temperature, Zeroth, 1st, 2nd and 3rd law of thermodynamics, Concept of internal energy, enthalpy and entropy, Problems

Properties of Steam and Steam Generator

Formation of steam at constant pressure, Thermodynamic properties of steam, Use of steam tables, Measurement of dryness fraction by throtting calorimeter.

Section-B

Refrigeration & Airconditioning : Introduction to refrigeration and air conditioning, Rating of refrigeration machines, Coefficient of performance, Simple refrigeration vapour compression cycle, Psychrometric charts and its use, Human conforts.

Hydraulic Turbines & Pumps :

Introduction, Classification, Construction details and working of Pelton, Francis and Kaplan turbines, Specific speed and selection of turbines,m Classification of water pumps and their working.

Section-C

Power Transmission Methods and Devices : Introduction to Power transmission, Belt Rope, Chain and Gear drive, Types and functioning of clutches.

Stresses and Strains :

Introduction, Concept & Types of Stresses and Strains, Poison's ratio, stresses and strains in simple and compound bars under axial, flexure & torsional loading, Stress-strain diagrams, Hooks law, Elastic constants & their relationships.

Text Books :

1.   Elements of Mechanical Engineering-R.K. Rajput Lakmi Pub., Delhi.

2.   Elements of Mechanical Engineering- D.S. Kumar, S.K. Kataria and Sons.

3.   Engineering Thermodynamics- P.K. Nag TMH, New Delhi.

4.   Refrigeration & Airconditioning - Arora & Domkundwar, Dhanpat rai & co. pvt. ltd.

5.   Workshop Technology Volt. I & II - Hazra & Chaudhary, Asian Book Comp. New Delhi.

6.   Process and Materials of Manufacture- Lindberg, R.A. Prentice Hall of India, New Delhi.

7.   Principles of Manufacturing Materials and Processes - Campbell, J.S. McGraw-Hill.

Reference Books :

1.   Strength of Materials- Popov, Pub. - PHI, New Delhi.

2.   Hydraulic Machines- Jagdish Lal, Pub.- Metropolitan,

Allahabad.

3.   Strength of Materials- G.H. Ryder, Pub. ELBS.

4.   Hydraulic and Fluid Mechanics- Modi and Seth, Pub. -Standard Book House, New Delhi.

5.   Engineering Thermodynamics - C.P. Arora, Pub. TMH, New Delhi.

6.   Refrigeration & Airconditioning- C.P. Arora Pub. - TMH New Delhi.

7.   Manufacturing Science - Amitabha Ghosh & Ashok Kumar Malik, East-West Press.

8.   Manufacturing Process and Systems- Ostwald, Munoz, John Wiley.

9.   Workshop Technology, Vol. 1, 2 & 3 - Chapman, WAJ, Edward Arnold.

ME-103F : ENGINEERING GRAPHICS & DRAWING

L T P		
1 0 3	Sessional	50 Marks
	Exam	100 Marks
	Total	150 Marks
	Duration of Exam 4 Hrs.	

Notes :

Examiner will set 9 questions in total, two questions from each section and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total, selecting at least one question from each session.

Section-A

Projections of Points, Straight Lines and Planes

Introduction, Various types of projections, First and Third angle systems of orthographic projections, types and use of lines and lettering, Dimensioning, Projection of Points in different quadrants, projections of lines and planes for parallel, perpendicular & inclined to horizontal and vertical reference planes.

Projections Solids and Development of Surfaces

Cylinder, Cone, Pyramid, & Sphere with axes parallel, perpendicular & inclined to both reference planes. Development of surfaces of various solids.

Section-B

Sections of solids

Section planes, Sectional views, True shape of Sections for Prism, Cylinder, Pyramid, Cone and Sphere.

Orthographic Projections

Simple objects and Simple Machine Components like Bolts and Screw.

Section-C

Isometric Projection

Isometric scales, isometric views of Simple objects.

Introduction to computer-aided drafting (CAD) :

Cartesian and Polar Co-ordinate system, Absolute, and Relative Co-ordinates systems; Basic Commands : Line, Point, Rectangle, Polygen, Circle, Arc, Ellipse, Polyline; Basic editing Commands: Basic Object Selection Methods, Window and Crossing Window, Erase, Move, Copy, Offset, Fillet, Chamfer, Trim, Extend, Mirror, Display Commands : Zoom, Pan, Redraw, and Regenerate; Simple dimensioning and text, Simple exercises.

Section-D

Solid modeling :

Basics of 2-D and 3-D solid modeling, orthographic, iso-metric

projection drawing and sectional views of simple machine elements.

Text Book :

1. Engineering Drawing Plane and Solid Geometry : N.D. Bhatt and V.M. Panchal, Forty-Fourth Edition 2002, Charotar Publishing House.

2. Engineering Drawing : Laxmi Narayan and Vaishwanar, Charotar Publishing House

3. Engineering Graphics and Drafting : P.S. Gill, Millenium Edition, S.K. Kataria and Sons.

4. Engineering Graphics using AUTOCAD 2007 ; T. Jeyapoovan, Fiest Edition 2002, Vikas Publishing House.

Reference Books

1. A Text Book of Engineering Drawing : S.B. Mathur, Second Revised and Enlarged Edition 2000, Vikas Publishing House.

2. Autocad 2008 instructor; James A Leach, TMH New Delhi.

3. Engineering Graphics with an introduction to Auto CAD : D. Jolhe, TMH, New Delhi.

PHY-104F : PHYSICS-2 LAB

L T P	Sessional	25 Marks
0 0 2	Exam	25 Marks
	Total	50 Marks
	Duration of Exam 3 Hrs.	

Notes :

(i) Students will be required to perform atleast 10 experiments out of the list.

(ii) The experiments in Second semester will be based upon

Electricity, Magnetism, Modern Physics and Solid State Physics which are the parts of theory syllabus.

Section-A

1. To find the low resistance by carey- Foster's bridge.
2. To find the resistance of a galvanometer by Thomson's constant difflection method using a post office box.
3. To find the value of high resistance by Substitution method.
4. To find the value of high resistance by Leakage method.
5. To study the characteristics of a solar cell and to find the fill factor.
6. To find the value of e/m for electrons by Helical method.
7. To find the ionisation potential of Argon/Mercury using a thyratron tube.
8. To study the variation of magnetic field with distance and to find the radius of coil by Stewart and Gee's appratus.
9. To study the characteristics of (Cu-Fe, Cu-Constantan) thermo couple.
10. To find the value of Planck's constant by using a photo electric cell.
11. To find the value of co-efficient of self-inductance by using a Rayleigh beidge.
12. To find the value of Hall Co-efficient of semi-conductor.
13. To study the V-I characteristics of a p-n diode.
14. To find the band gap of intrinsic semi-conductor using four probe method.
15. To calculate the hysteresis loss by tracing a B-H curve.

Recommended Books :

1. Advanced Practical Physics - B.L. Workshop and H.T. Flint

KPH)

2. Practical Physics- S.L. Gupta & V. Kumar (PRagati Prakashan).
3. Advanced Practical Physics Vol. I & II- Chauhan & Singh (Pragati Prakashan).

ECE-103F : BASIC OF ELECTRONICS LAB [002]

1. To get familier with the working knowledge of the following instruments :
   a) Cathode ray oscilloscope (CRO)
   b) Multimeter (Analog and Digital)
   c) Function generator
   d) Power Supply
2. a) To measure phase difference between two waveforms using CRO.
   b) To measure an unknown frequency from Lissajous figures using CRO
3. a) Plot the forward and reverse V-I characteristics of P-N junction diode.
   b) Calculation of cut-involtage
   c) Study of Zener diode in breakdown region.
4. To plot and study the input and output characteristics of BJT in common-emitter configuration
5. To find frequency response of a given amplifier and calculate its bandwidth.
6. To get familiar with pin-configuration of typical op-amp (741) and its use as :
   a) Inverting amplifier
   b) Non-inverting amplifier
   c) Summing amplifier

d) Difference amplifier

7. Use of op-amp as

a) Integrator

b) Differentiator

8. To assemble Wein Bridge oscillator circuit and calculation of oscillation-frequency and its verification from the observed output.

9. To assemble and test 5V/9 V DC regulated power supply and find its line-regulation and loand-regulation.

10. Verification of truth tables of logic gates (OR, AND, NOT, NAND, NOR)

11. Verification of truth tables of flip-flops (S-R,. J-K).

12. To get familiar with the working and use of seven-segment display.

CH-1034F : ENGINEERING CHEMISTRY LAB

L T P		
0 0 2	Sessional	25 Marks
	Exam	25 Marks
	Total	50 Marks
	Duration of Exam 3 Hrs.	

LIST OF EXPERIMENT

1. Determination of Ca^{++} and Mg^{++} hardness of water using EDTA solution.

2. Determination of alkalinity of water sample.

3. Determination of dissolved oxygen (DO) in the given water sample.

4. To find the eutectic point for a two component system by using method of cooling curve.

5. Determination of viscosity of lubricant by Red Wood Viscosity (No. 1 & No.2)

6. To determine flash point & fire point of an oil by Pensky Marten's flash point apparatus.

7. To Prepare Phenol - formaldehyde and Urea formaldehyde resin.

8. To find out saponification No of Oil.

9. To determine TDS of Water samples of different sources.

10. Determination of concentration of $KMnO_4$ solution sprecrophotomererically.

11. Determination of strength of HCl solution by titrating against NaOH solution conductometerically.

12. To determine amount of sodium and potassium in a, given water sample by flame photometer.

13. Estimation of total iron in an iron alloy.

Note : At least ten experiments are to be performed by students.

Suggested Books :

1. Any text book on Experimental and Calculation, Engineering Chemistry.

CSE-103F : FCPC LAB

L T P		
0 0 2	Class Work	25 Marks
	Exam	25 Marks
	Total	50 Marks
	Duration of Exam 3 Hrs.	

Important Note :-

In addition to the experiments listed below, 5 to 10 more lab-exercise

may be given by the teacher concerned to the students for practice depending upon the progress of the students in programming capabilities. It is suggested (not mandatory) that the institute concerned may allot more number of teachers in each of the First Year Lab Classes of this **FCPC-Lab Course** so that the teacher can give more and more emphasis on "personal eye-to-eye attention" in the Lab to each and every student so that the students can truly learn How to write correct and efficient code independently with their self-confidence. Building this confidence in the students is more important to the teachers than the number-statistics i.e. "the **Total Number** of experiments" finished/done by the students in this FCPC Lab.

The Lab Teacher/ Technician will introduce (show) the students in the lab the different Hardware organization of a computer. Input/Output devices. Input/Output pors and connectors etc. on the very first day before the start of the following experiments.

Sample (types) of the programming problems to be practiced :-

1. Write to a program to find the largest of three numbers. (if then-else).

2. Write a program to find the largest of ten numbers (for-statement)

3. Write a program to find the average mail height & average female heights in the class (input is in the form of sex code, height).

4. Write a program to find roots of a quadratic equation using functions and switch statements.

5. Write a program using arrays to find the largest and second largest numbers out of given 50 numbers.

6. Write a program to multiply two matrices.

7. Write a program to read a string and write it in reverse order.

8. Write a program to concatenate two strings of different lengths.

9. Represent a deck of playing cards using arrays.

10. Write a program to check that the input string is a palindrome or not.

11. Programs on file handling.

EE-103F : ELECTRICAL TECHNOLOGY LAB

L T P   Class Work   25 Marks

0 0 2   Exam   25 Marks

                              Total   50 Marks

                              Duration of Exam 3 Hrs.

Notes :

(i)   At least 10 experiments are to performed by students in the semester.

(ii) At least 7 experiments should be performed from the above list, remaining three experiments may either be performed from the above list or designed and set by the concerned institution as per the scope of the syllabus of EE-101-E.

LIST OF EXPERIMENTS

1. To verify KCL and KVL.

2. To verify Thevenin's and Norton theorem/

3. To verify Maximum Power transfer theorem in A.C. and D.C.

4. To verify Superposition theorem.

5. To study frequency response of a series R-L-C circuit and determine resonant frequency and Q-factor for various values of R, L, C.

6. To study frequency response of a Parallel R-L-C circuit and determine resonant frequency and Q-factor for various values

of R,L,C.

7. To perform direct load test of a transformer and plot efficiency Vs load characteristic.

8. To perform direct load test of a D.C. shunt generator and plot load voltage Vs load current curve.

9. To perform O.C. and S.C. tests of a transformer.

10. To study various type of meters.

11. Measurement of power by 3 voltmeter/3 Ammeter method.

12. Measurement of power in a 3-phase system by two wattmeter method.

ME-107F : BASICS OF MECHANICAL ENGINEERING LAB

L T P   Sessional   25 Marks

- - 2   Exam   25 Marks

                      Total   50 Marks

                      Duration of Exam 3 Hrs.

Notes :

(i) At least 10 experiments are to performed by students in the semester.

(ii) At least 7 experiments should be performed from the above list, remaining three experiments may either be performed from the above list or designed and set by the concerned institution as per the scope of the syllabus.

LIST OF EXPERIMENTS

1. To study the Cochran and Badcock & Wilcox boilers.

2. To study the working and function of mountings and accessories in boilers.

3. To study Two-Stroke & Four-Stroke Diesel Engines.

4. To Study Two-Stroke & Four-Stroke Petrol Engines.

5. To study the vapour compression Refrigeration System and determination of its C.O.P.

6. To study the functioning of Window Room Air Conditioner.

7. To study the constructional features and working of Pelton Wheel Turbine, Fransis Turbine and Kaplan Turbine.

8. To calculate the Mechanical Advantage, Velocity Ratio and Efficiency of Single Start, Double Start and Triple Start Worm Wheel.

9. To calculate Mechanical Advantage, Velocity Ratio and Efficienty of Single Purchase and Double purchase winch crab and plot graphs.

10. To find the percentage error between observed and calculated values of stresses in the member of a Jib Crane.

11. To study simple screw jack and compound screw jack and determine their efficiency.

12. To find the Mechanical Advantage, Velocity Ratio and Efficiency of a Differential Wheel & Axle.

13. To perform tensile test, plot the stress,-strain diagram and evaluate the tensile properties of a given metallic specimen.

ME-105F : WORKSHOP TECHNOLOGY

L T P   Class Work   50 Marks

2 0 2   Exam   25 Marks

                      Total   75 Marks

                      Duration of Exam 3 Hrs.

Notes :

(i)   At least 10 experiments are to performed by students in the semester.

(ii)   At least 7 experiments should be performed from the above list, remaining three experiments may either be performed from the above list or designed and set by the concerned institution as per the scope of the syllabus.

Manufacturing Processes :

Introduction to manufacturing Processes and their Classification, Industrial Safety; Introduction, Types of Accidents, Causes and Common Sources of Accident, Methods of Safety, First Aid, Objectives of Layout, Types of Plant Layout and their Advantages.

Foundry, Forming and Wielding :

Foundry : Introduction to Casting Processes, Basic Steps in Casting Processes, Pattern : Types of Pattern and Allowances, Sand Casting : Sand Properties, Constituents and Preparation. Mould & Core Making with assembly and its Types. Gating System. Melting of Metal, Furnaces and Cupola, Metal Pouring, Fettling. Casting Treatment, Inspection and Quality Control. Sand Casting Defects & Remedies.

Forming Processes : Basic Principle of Hot & Cold Working, Hot & Cold Working Processes, Rolling, Extrusion, Forging, Drawing, Wire Drawing and Spinning. Sheet Metal Operations : Measuring, Layout marking, Shearing, Punching, Blanking, Pierching, Forming, Bending and Joining.

Welding : Introduction to Welding, Classifiction of Welding Processes, Gas Welding : Oxy-Acetylene Welding, Resistance Welding : Spot and Seam Welding, Arc Welding : Metal Arc, TIG & MIG Welding, Welding Defects and Remedies, Soldering & Brazing.

List of Experiments/ Jobs

1.   To study different types of measuring tools used in metrology and determine least counts of vernier calipers, micrometers and vernier height gauges.

2.   To study different types of machine tools (lathe, shape or planer or slotter, milling, drilling machines)

3.   To prepare a job on a lathe involving facing, outside turning, taper turning, step turning, radius making and parting-off.

4.   To study different types of fitting tools and marking tools used in fitting practicle.

5.   To prepare lay out on a metal sheet by making and prepare rectangular tray, pipe shaped components e.g. funnel.

6.   To prepare joints for welding suitable for butt welding and lap welding.

7.   To perform pipe welding.

8.   To study various types of carpentry tools and prepare simple types of at least two wooden joints.

9.   To prepare simple engineering components/ shapes by forging.

10.   To prepare mold and core assembly, to put metal in the mold and fettle the casting.

11.   To prepare horizontal surface/ vertical surface/ curved surface/ slots or V-grooves on a shaper/planner.

12.   To prepare a job involving side and face milling machine.

GES-106F : ENVIRONMENTAL STUDIES

Theory   75 Marks

Field Work   25 Marks

(Practical)

Unit-1 the Multidisciplinary nature of environmental studies. Definition,

scope and importance.

Unit-2 Natural Resources :

Renewable and non-renewable resources :

Natural resources and associated problems.

a) Forest resources : Use and over-exploitation : deforestation, case studies. Timber extraction, mining dams and their effects on forests and tribal people.

b) Water resources : Use and over-utilisation of surface and goround water, floods, drought, conflicts over water, dams-benefits and problems.

c) Mineral resources : Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

d) Food resources : World food problems, changes, caused by agriculture and overgrazing, effects of modern agriculture, fertrilizer-pesticide problems, Water logging, salinity, case studies.

e) Energy resources : Growing energy needs; renewable and non-renewable energy sources, use of alternate energy sources, case studies.

f) Land resources : Land as a resource, loand degradation, man induced landslides, soil erosion and desertification.

* Role of an individual in conservation of natural resources.

* Equitable use of resources for sustainable lifestyles.

(8 lectures)

Unit-3 Ecosystems :

* Concept of an ecosytem.

* Structure and function of an ecosystem.

* Producers, consumers and decompoers.

* Energy flow in the ecosystem.

* Ecological succession.

* Food chains, food wbs and ecological pyramids.

* Introduction, types, characteristic features, structure and function of the following eco-system :

a. Forest ecosystem.

b. Grassland ecosystem.

c. Desert ecosystem.

d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

(6 lectures)

Unit-4 Biodiversity and its conservation

* Introduction - Definition : Genetic, Species and ecosystem diversity.

* Biogeographical classification of India.

* Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values.

* Biodiversity at global, National and local levels.

* India as a mega-diversity nation.

* Hot-spots of biodiversity.

* Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts.

* Endangered and endemic species of India.

* Conservation of biodiversity : In-situ and ex-situ conservation of biodiversity.

(8 lectures)

Unit-5 Environmental pollution :

Definition, causes, effects and control measures of :

a) Air pollution.

b) Water pollution

c) Soil pollution

d) Marine pollution

e) Noise pollution

f) Thermal pollution

g) Nuclear hazards

* Solids waster management : causes, effects and control measures of urban and industrial wastes.

* Role of an individual in preventation of pollution.

* Pollution cae studies.

* Disaster management : floods, earthquake, cyclone and landslides.

(8 lectures)

Unit-6 Social issues and the Environment :

* From unsustainable to sustainable development.

* Urban problems related to energy.

* Water conservation, rain water harvesting, watershed management.

* Resettlement and rehabilitation of people : its problems and concerns case studies.

* Environmental ethics : Issues and possible solutions.

* Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.

* Wasteland reclamation.

* Consumerism and waste products.

* Environment Protrection Act.

* Air (Prevention and Control of pollution) Act.

* Water (Prevention and Control of pollution) Act.

* Wildlife Protection Act.

* Forest Conservation Act.

* Issues involved in enforcement of environmental legislation.

* Public awareness.   (7 lectures)

Unit-7 Human population and the Environment.

Population growth, variation among nations.

Population explosion- Famility Welfare Programme.

Environment and human health.

Human Rights.

Value Education.

HIV/AIDS.

Woman and Child Welfare

Role of Informatoin Technology in Environment and human health.

Case Studies.   (6 lectures)

Unit-8 Field Work :

* Visit to a local area to document environmental assets - river/forest/grassland/hill/mountain.

* Visit to a local polluted site-urban/Rural/ Industrial/ Agricultural.

* Study of common plants, insects, birds.

* Study of simple ecosystems- pond, river, hill slopes, etc. (Field work equal to 5 lecture hours).

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7. Down to Earth, Centre for Science and Environment (R).

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    (M) Magazine

    (R) Reference

    (TB) Textbook

The scheme of the paper will be under :

The subject of Environmental Studies will be included as a qualigying paper in all UG Courses (including professional courses also) and the students will be required to qualify the same otherwise the final result will not be declared and degree will not be awarded.

Annual System : The duration of the course will be 50 lectures. The examination will be conducted alongwith with the annual examinations. Wherever semester system prevails the environmental Course of 50 lectures will be conducted in the second semester and the examination shall be conducted at the end of the second semester.

Exam. Pattern : In case of awarding the marks, the question paper will carry 100 marks. Theory : 75 marks, Practical : 25 marks. The structure of the question paper will be :

Part- A : Short Answer Pattern   :   25 marks

Part- B : Essay Type with inbuilt choice   :   50 marks

Part-C : Field Work (Practical)   :   25 marks

Instructions for Examiners :

Part- A : Question No. 1 is compulsory and will contain ten short-answer type question of 2.5 marks each covering the entire syllabus.

Part-B : Eight essay type questions (with inbuilt choice) will be set from the entire syllabus and the candidate will be required to answer any four of them. Each essay type question will be of 12.5 marks.

The examination of the regular students will be conduted by the concerned college/Institute and the examinations of Private/Distance Education mode students will be conducted by the University. Each student will be required to score minimum 35% marks separately in theory and practical. The marks in this qualifying paper will not be included in determining the percentage of marks obtained for the award of degree. However, these marks will be shown in the detailed marks certificate of the students.