B.Tech Syllabus – I Year

(Common for All Branches)

SBIT

ENGINEERING TOMORROW

Shri Balwant Institute of Technology

NCR Delhi, Sonepat

Approved by AICTE, Min. of HRD, Govt. of India and DTE, Govt. of Haryana

Affiliated to DCR University of Science & Technology, Murthal, Sonepat

Deenbandhu Chhotu Ram University of Science & Technology, Murthal (Sonepat)

SCHEME OF STUDIES & EXAMINATIONS

B. Tech. 1st YEAR (SEMESTER – I) (COMMON FOR ALL BRANCHES)

Credit Based Scheme w.e.f. 2011-12

Sr. No.	Course No.	Course Title	Teaching Schedule				Marks of Class Work	Exam. Marks		Total Marks	Credit	Duration of Exam.
			L	T	P	Total		Theory	Practical			
1	HUM- 101	ESSENTIALS OF COMMUNICATION	3	1	-	4	50	100	-	150	4	3
2	MATH-101	MATHEMATICS-I	3	2	-	5	50	100	-	150	5	3
3	PHY-101	PHYSICS-I	3	1	-	4	50	100	-	150	4	3
4	ME-103	MANUFACTURING PROCESSES **(Gr – A)**	4	-	-	4	50	100	-	150	4	3
	CH-101	CHEMISTRY **(Gr - B)**	3	1	-	4	50	100	-	150	4	3
5	CSE- 101	FUNDAMETALS OF COMPUTER OF COMPUTER & PROGRAMMING IN C **(Gr – A)**	3	1	-	4	50	100	-	150	3	3
	EE-101	ELECTRICAL TECHNOLOGY **(Gr - B)**	3	1	-	4	50	100	-	150	4	3
6	GES-101	ENVIRONMENTAL STUDIES **(Gr - B)**	3	-	-	3	-	75	-	75*****	0	3
7	ME-101	ELEMENTS OF MECHANICAL ENGINEERING **(Gr – A)**	3	1	-	4	50	100	-	150	4	3
	ME-105	ENGINEERING GRAPHICS & DRAWING **(Gr - B)**	-	-	4	4	50	-	100	150	4	3
8	PHY-103	PHYSICS LAB – I	-	-	2	2	25	-	25	50	2	3
9	ME-107	WORKSHOP PRACTICE **(Gr – A)**	-	-	4	4	25	-	25	50	4	3
	CH-103	CHEMISTRY LAB **(Gr - B)**	-	-	2	2	25	-	25	50	2	3
10	CSE- 103	COMPUTER PROGRAMMING LAB **(Gr – A)**	-	-	2	2	25	-	25	50	2	3
	EE-103	ELECTRICAL TECHNOLOGY LAB **(Gr - B)**	-	-	2	2	25	-	25	50	2	3
11	ME-109	ELEMENTS OF MECH. ENGINEERING LAB **(Gr – A)**	-	-	2	2	25	-	25	50	2	3
12	GES- 103	ENVIRONMENTAL STUDIES FIELD WORK **(Gr - B)**	-	-	-	-	-	-	25	25*****	0	3
TOTAL (Gr-A / Gr-B)			**19/18**	**6/6**	**10/10**	**35/34**	**400/375**	**600/500**	**100/175**	**1100/1050**	**34/31**	

*****Not included in total marks.

Note:

1. **GROUP A** will study the subjects (ME-101,ME-103,CSE-101,ME-107,CSE-103,ME-109) **GROUP B** will study the subjects (ME-105, CH-101, EE-101, CH-103, EE-103, GES-101, GES-103)
2. **GROUP A** includes students of branches BME, BT, CSE, ECE, IT. **GROUP B** includes students of branches CE, CHE, EE, ME.
3. Environmental Studies (GES-101) and Environmental Studies Field Work (GES-103) are qualifying courses.
4. Students will be allowed to use non-programmable scientific calculator. However, sharing of calculator will not be permitted in the examinatio

Deenbandhu Chhotu Ram University of Science & Technology, Murthal (Sonepat)

SCHEME OF STUDIES & EXAMINATIONS

B. Tech. 1st YEAR (SEMESTER – II) (COMMON FOR ALL BRANCHES)

Credit Based Scheme w.e.f. 2011-12

Sr. No.	Course No.	Course Title	Teaching Schedule				Marks of Class Work	Exam. Marks		Total Marks	Credit	Duration of Exam.
			L	T	P	Total		Theory	Practical			
1	HUM-102 BTT -102	COMMUNICATION SKILLS IN ENGLISH **(Except BT)** BASICS OF BIOTECHNOLOGY **(Only BT)**	3 3	1 1	- -	4 4	50 50	100 100	- -	150 150	4 4	3 3
2	MATH-102	MATHEMATICS-II	3	2	-	5	50	100	-	150	5	3
3	PHY-102	PHYSICS-II	3	1	-	4	50	100	-	150	4	3
4	ME-103 CH-101	MANUFACTURING PROCESSES **(Gr - B)** CHEMISTRY **(Gr – A)**	4 3	- 1	- -	4 4	50 50	100 100	- -	150 150	4 4	3 3
5	CSE-101 EE-101	FUNDAMENTALS OF COMPUTER & PROGRAMMING IN C **(Gr - B)** ELECTRICAL TECHNOLOGY **(Gr – A)**	3 3	1 1	- -	4 4	50 50	100 100	- -	150 150	3 4	3 3
6	GES-101	ENVIRONMENTAL STUDIES **(Gr – A)**	3	-	-	3	-	75	-	75*****	0	3
7	ME-101 ME-105	ELEMENTS OF MECH. ENGINEERING **(Gr - B)** ENGINEERING GRAPHICS & DRAWING **(Gr – A)**	3 -	1 -	- 4	4 4	50 50	100 -	- 100	150 150	4 4	3 3
8	PHY-104	PHYSICS LAB – II	-	-	2	2	25	-	25	50	2	3
9	ME-107 CH-103	WORKSHOP PRACTICE **(Gr- B)** CHEMISTRY LAB **(Gr – A)**	- -	- -	4 2	4 2	25 25	- -	25 25	50 50	4 2	3 3
10	CSE-103 EE-103	COMPUTER PROGRAMMING LAB **(Gr - B)** ELECTRICAL TECHNOLOGY LAB **(Gr – A)**	- -	- -	2 2	2 2	25 25	- -	25 25	50 50	2 2	3 3
11	ME-109	ELEMENTS OF MECH. ENGG. LAB **(Gr - B)**	-	-	2	2	25	-	25	50	2	3
12	GES-103	ENVIRONMENTAL STUDIES FIELD WORK **(Gr – A)**	*	-	-	-	-	-	25	25*	0	3
13	GP-102	GENERAL PROFICIENCY	-	-	-	-	50	-	-	50	2	-
			19/18	**6/6**	**10/10**	**34/35**	**450/425**	**600/500**	**100/175**	**1150/1100**	**36/33**	**-**

***** Not included in total marks.

Note:

1. **GROUP A** will study the subjects (ME-105, CH-101, EE-101, CH-103, EE-103, GES-101, GES-103).
2. **GROUP B** will study the subjects (ME-101, ME-103, CSE-101, ME-107, CSE-103, ME-109).
3. **GROUP A** includes students of branches BME, BT, CSE, ECE, IT.
4. **GROUP B** includes students of branches CE, CHE, EE, ME. 3. Environmental Studies (GES-101) and Environmental Studies Field Work (GES-103) are qualifying courses. Students will be allowed to use non-programmable scientific calculator. However, sharing of calculator will not be permitted in the examination.

HUM – 101 ESSENTIALS OF COMMUNICATION
(Common for all Branches)

The course aims at inculcating a minimum level of language proficiency among students of Engineering and Technology. The purpose is to sensitize them to the nuances of English and its applications for various communication needs.

L	T	P	Credits
3	1	--	4

Class Work	**:**	50 Marks
Examination	**:**	100 Marks
Total	**:**	150 Marks
Duration Examination	**:**	3 Hours

COURSE CONTENT:

Unit-I: Semantics: Synonyms, Antonyms, Homophones, Homonyms, Form and function of words

Unit-II: Syntax: Sentence structures, Verb patterns and their usage

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

Unit-IV: Comprehension: Listening and Reading comprehension – Note taking, Reviewing, Summarising, Interpreting, Paraphrasing and Précis Writing.

Unit-V: 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

Unit-VI: Text: ***English for Students of Science*** by A.Roy and P.L. Sharma (Orient Longman)
Chapters for Study:
i) "The year 2050" by Theodore J. Gordon.
ii) "The Mushroom of Death" by A. Bandhopadhyay. iii) "The Discovery" by Herman Ould.
The prescribed text will be used as a case study for various components of the syllabus.

Unit-VII (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 P.L. Sharma, 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. Subramanian, Orient Longman.

SUGGESTED READING:

1. English Grammar, Composition 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. Hornby, OUP, Delhi.
4. A Textbook of English Phonetics for Indian Students by T. Balasubramanian, MacMillan, Chennai.
5. Better English Pronunciation by J.D.O'Connor, Cambridge Univ. Press, London.
6. English Vocabulary in Use by McCarthy, Foundation Books (Cambridge University Press), Delhi.

7. Assessing Listening by Buck, Foundation Books (Cambridge University Press), Delhi.
8. Reading Between the Lines by McRae, Foundation Books (Cambridge University Press), Delhi.

SCHEME OF EXAMINATION:

There will be seven questions in all covering all the units, except Unit VII which (besides other modes of internal evaluation) is for internal assessment only.
All questions will be compulsory and will have sufficient internal choice.

Unit-I: 15 Marks
The question will be set so as to evaluate the following: Usage of the words given, Changing the grammatical quality and function of the words, One word Substitutes, synonyms, antonyms, homophones, homonyms.

Unit-II: 20 Marks
There will be one question having different parts. The question should test students' knowledge of sentence structures and verb patterns. The question can be in the nature of 'Do as directed', 'Tracing and rectifying structural
Errors', 'Elucidating patterns through sentences and vice-versa', 'Changing the word-order', 'Synthesizing the sentences'
and 'Completing the sentences', etc.

Unit-III: 15 Marks
There will be two questions from this Unit. Question one will be in the nature of short notes testing the basic concepts and articulation of speech sounds. The second question would require transcription of individual words and simple sentences.

Unit-IV: 15 Marks
Comprehension and Interpretation of a passage given (Literary or non-literary, newspaper article, story, extract from a speech etc.), will be judged for its vocabulary, general understanding and interpretation of the content in the form of question answer exercise, culling out important points, suggesting a suitable topic/title, summarising and précis writing etc.

Unit-V: 15 Marks
The question will require the definition, description, analysis, explanation of various objects and processes. Bedsides, a topic of contemporary relevance may be given for writing a paragraph in any one of the writing forms prescribed in the unit.

Unit-VI: 20 Marks
There will be two questions from the text prescribed. The first question will evaluate the comprehension of the text through short answer questions or a long answer question.
The second question will judge the linguistic aspect of the text such as using a particular word in its various syntactic forms like noun, adjective, verb etc.; matching the lists of words and their explanation; providing opposite/similar meanings, adding suffixes and prefixes etc.

MATH – 101 MATHEMATICS – I

L	T	P	Credits
3	2	--	5

Class Work	**:**	50 Marks
Examination	**:**	100 Marks
Total	**:**	150 Marks
Duration Examination	**:**	3 Hours

Part - A

Infinite series: Convergence and divergence, Comparison, D' Alembert's ratio, Integral, Raobes, Logrithmic and Cauchy root tests, Alternating series, Absolute and conditional convergence.

Applications of Differentiation: Taylor's and Maclaurin's series, Asymptotes, Curvature Asymptotes.

Partial Differentiation & its Applications: Functions of two or more variables; partial derivatives, Total differential and differentiability, Derivatives of composite and implicit functions, Jacobians, Higher order partial derivatives.
Homogeneous functions, Euler's theorem, Taylor's series for functions of two variables (without proof), maxima- minima of function of two variables, Lagrange's method of undetermined multipliers, Differentiation under integral sign.

Part - B

Applications of Single & Multiple Integration: 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 and volume of solids of revolution.
Triple integral, volume of solids, change of variables, Beta and gamma functions and relationship between them.

Vector Calculus : Differentiation of vectors, scalar and vector point functions Gradient of a scalar field and directional derivative, divergence and curl 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 simple applications.

TEXT BOOKS:

1. Advanced Engineering Mathematics : F. Kreyszig.
2. Higher Engineering Mathematics : B.S. Grewal.

REFERENCE BOOKS:

1. Engineering Mathematics Part-I: S.S. Sastry.
2. Differential and Integral Calculus: Piskunov.
3. Advanced Engineering Mathematics: R.K. Jain and S.R.K. Iyengar
4. Advanced Engg. Mathematics: Michael D. Greenberg

Note:

Examiner will set eight questions, taking four from Part-A and four from Part-B. Students will be required to attempt five questions taking at least two from each part.

PHY - 101 **PHYSICS - I**

L	T	P	Credits
3	1	--	4

Class Work	**:**	50 Marks
Examination	**:**	100 Marks
Total	**:**	150 Marks
Duration Examination	**:**	3 Hours

Part - A

Interference: Division of wave front-Fresnel's biprism, Division of amplitude – Newton's rings, Michelson interferometer, applications.

Diffraction: Difference between Fraunhofer and Fresnel diffraction. Fraunhofer diffraction through a slit. Plane transmission diffraction grating, its dispersive and resolving powers.

Polarization : Polarised and unpolarized light, double refraction; Nicol prism, quarter and half wave plates,Polarimetry; Biquartz and Laurent's half-shade polarimeters, Simple concepts of photoelasticity.

LASER: Spontaneous and stimulated emissions, Laser action, characteristics of laser beam-concepts of coherence, He-Ne and semiconductor lasers (simple ideas), applications.

FIBRE OPTICS: Propagation of light in fibres, numerical aperture, single mode and multi mode fibres, applications.

Part - B

WAVE AND OSCILLATIONS: Simple concepts of Harmonic Oscillator, resonance, quality factor.
E.M. wave theory-review of basic ideas, Maxwell's equations, simple plane wave equations, simple concepts of wave guides and co-axial cables, Poynting vector.

DIELECTRICS: Molecular theory, polarization, displacement,susceptibility, dielectric coefficient, permitivity & various relations between these, Gauss's law in the presence of a dielectric, Energy stored in an electric field. Behaviour of dielectrics in a.c. field-simple concepts, dielectric losses.

SPECIAL THEORY OF RELATIVITY: Michelson-Moreley experiment, Lorentz transformations, variation of mass with velocity, mass energy equivalence.

NUCLEAR PHYSICS: Neutron Cross-section, Nuclear fission, Moderators, Nuclear reactors, Reactor criticality, Nuclear fusion. Interaction of radiation with matter-basic concepts, radiation detectors-ionisation chamber, G.M. Counter, Scintillation and solid state detectors, cloud chamber and bubble chamber.

TEXT BOOKS:

1. Physics of the Atom - Wehr, Richards & Adair (Narosa)
2. Perspectives of Modern Physics - Arthur Beiser (TMH)
3. Modern Engineering Physics – A.S. Vasudeva (S. Chand)

REFERENCE BOOKS :

1. Electricity and Magnetism – F.W. Sears (Narosa)
2. Physics Vol-I & II – Resnick & Halliday (Wiley Eastern)
3. A Text Book of Optics – Brij Lal & Subramanyam

Note:

The Examiners will set eight questions, taking four from each part. The students will be required to attempt five questions in all selecting at least two from each part. All questions will carry equal marks.

CH - 101 CHEMISTRY

L	T	P	Credits
3	1	--	4

Class Work	**:**	50 Marks
Examination	**:**	100 Marks
Total	**:**	150 Marks
Duration Examination	**:**	3 Hours

Unit-1: Thermodynamics - Second law, concept of Entropy, Entropy change for an ideal gas, free energy and work functions, Free energy change, Chemical Potential, Gibb's Helmholtz equation, Clausius - Clapeyron equation, Related numerical problems with above topics.

Unit-2: Phase-Rule - Terminology, Derivation of Gibb's Phase Rule Equation, One Component System (H2O System), Two Components systems, Eutectic system (Pb-Ag), system with congruent m.pt. (Zn-Mg), systems with incongruent m.pt. (Na-K), Applications of above Systems.

Unit-3: Water & its treatment : Part I – Sources of water, impurities in water, hardness of water and its determination, units of hardness, alkalinity of water and its determination, Related numerical problems, scale and sludge formation (composition properties and methods of prevention).

Unit-4: Water and its treatment : Part II – Treatment of water for domestic use, coagulation, sedimentation, filtration and dis-infection, water softening, ion-exchange process, mixed bed demineralisation, Desalination (reverse osmosis) (electrodialysis).

Unit-5: **Corrosion and its prevention** - Galvanic & concentration cell, Dry and wet corrosion, Electrochemical theory of corrosion, Galvanic corrosion, pitting corrosion, water-line corrosion, differential aeration corrosion, stress corrosion, factors affecting corrosion, Preventive measures (proper design, Cathodic protection, protective coatings).

Unit-6: Lubrication and Lubricants - Friction, mechanism of lubrication, classification and properties of lubricants, Additives for lubricants, synthetic lubricants, Greases – Preparation & properties (consistency, drop point) and uses.

Unit-7: **Polymers and Polymerization** - Organic polymers, polymerisation, various types of polymerisation, effect of structure on properties of polymers, preparation properties and technical applications of thermo- plastics (PVC, PVA), thermosets (PF,UF), & elastomers (SBR,GR-N), Silicones, Introduction to polymeric compsites.

Unit-8: **Analytical Methods** - Thermal methods, Principle, method and application of Thermogravimetric analysis, Differential thermal analysis and Differential scanning calorimetry , (Experimental details are excluded),Spectroscopic methods, Spectrophotometry, interaction of E.M. radiations with a molecule and origin of spectrum, spectroscopic, techniques-vibrational and electronic spectroscopy (Experimental details are excluded), conductometric titration, 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, Rajaram, Kuriacose (TMH).

REFERENCE BOOKS:

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).

Note:
Eight questions are to be set with a fair weightage of all the units. The candidates will be required to attempt five questions in all.

CSE - 101 FUNDAMENTALS OF COMPUTER & PROGRAMMING IN C

L	T	P	Credits			
3	1	--	4	**Class Work**	**:**	50 Marks
				Examination	**:**	100 Marks
				Total	**:**	150 Marks
				Duration Examination	**:**	3 Hours

Unit-1: An Overview of Computer System: Anatomy of a digital Computer, Memory Units, Main and Auxiliary
Storage Devices, Input Devices, Output Devices, Classification of Computers.
Radix number system: Decimal, Binary, Octal, Hexadecimal numbers and their inter-conversions; Representation of information inside the computers.

Unit-2: Operating System Basics: The user Interface, Running Programmes, Managing files, Introduction to PC operating Systems: Unix/Linux , DOS, Windows 2000.

Unit-3: Internet basics: **:** Introduction to the basic concepts of Networks and Data Communications**,** How Internet works, Major features of internet, Emails, FTP, Using the internet.

Unit-4: Programming Languages: Machine-, Assembly-, High Level- Language, Assembler, Compiler, Interpreter, debuggers, Programming fundamentals: problem definition, algorithms, flow charts and their symbols, introduction to compiler, interpreter, assembler, linker and loader and their inter relationship.

Unit-5: C Programming language: C fundamentals, formatted input/ output, expressions, selection statements, loops and their applications; Basic types, arrays, functions, including recursive functions, program organization: local and external variables and scope; pointers & arrays.

Unit-6: **Strings:** strings literals, string variables, I/O of strings, arrays of strings; applications. Preprocessor: preprocessor directives, macro definition, conditional compilation; Structures, Unions and Enumerations: Structure variables and operations on structures; Structured types, nested array structures; unions; enumeration as integers, tags and types.
Declaration: Declaration syntax, storage classes, types qualifiers, declarators, initializers.
Program Design: modules, information hiding, abstract data types, difference between C & C++, Low level programming: Bitwise operators, Bit fields in structures, other low level techniques.

Unit-7: Standard library: Input / output; streams, file operations, formatted I/O, character I/O, line I/O, block, string I/O, Library support for numbers and character data, error handling:

TEXT BOOKS:

1. Using Information Technology, 5th Edi, Brian K Williams & Stacey C. Sawyer, 2003, TMH
2. The C Programming Language by Dennis M Ritchie, Brian W. Kernigham, 1988, PHI.
3. C Programming – A modern approach by K.N. King, 1996, WW Norton & Co.
4. Fundamentals of Computing and C Programming, R. B. Patel, Tech Publications, New Delhi.

REFERENCE BOOKS:

1. Information technology, Dennis P. Curtin, Kim Foley, Kunal Sen, Cathleen Morin, 1998, TMH
2. Theory and problem of programming with C, Byron C Gottfried, TMH
3. Teach yourself all about computers by Barry Press and Marcia Press, 2000, IDG Books India.
4. Using Computers and Information by Jack B. Rochester, 1996, Que Education & Training.

Note:

Eight questions will be set by the examiner (at least 2 questions from unit-1 to 4, 2 each from unit –5 & 6, and one from unit-7). The students will be required to attempt 5 questions in all.

EE - 101 **ELECTRICAL TECHNOLOGY**
(Common for all Branches)

L	T	P	Credits
3	1	--	4

Class Work	**:**	50 Marks
Examination	**:**	100 Marks
Total	**:**	150 Marks
Duration Examination	**:**	3 Hours

Unit-I: D.C. CIRCUITS: Ohm's Law, Kirchoff's Laws, D.C. Circuits, Nodal and Loop methods of analysis.

Unit-II: (a) A.C. CIRCUITS: Sinusoidal signal, instantaneous and peak values, RMS and average values, phase angle, polar & rectangular, exponential and trigonometric representations; R,L and C components, behaviors of these components in A.C. circuits. Concept of complex power, power factor.
(b) TRANSIENT RESPONSE: Transient response of RL, RC and RLC Circuits with step input.

Unit- III: NETWORK THEOREMS: Thevenin's theorem, Norton's theorem, superposition theorem, maximum power transfer theorem, Reciprocity theorem, Tellegen's theorem, Milman's theorem. Star to Delta & Delta to Star transformation.

Unit-IV: SERIES AND PARALLEL A.C. CIRCUITS: Series and parallel A.C. circuits, series and parallel resonance, Q factor, cut-off frequencies and bandwidth.

Unit-V: THREE PHASE CIRCUITS: Phase and line voltages and currents, balanced star and delta circuits, power equation, measurement of power by two wattmeter method, Importance of earthing.

Unit-VI: TRANSFORMERS: Principle, construction & working of transformer, Efficiency and regulation.

Unit-VII: ELECTRICAL MACHINES: Introduction to D.C. Machines, Induction motor, Synchronous machines.

Unit-VIII: MEASURING INSTRUMENTS: Voltmeter, Ammeter, Watt meter, Energy meter.

TEXT BOOKS:

1. Basic Electrical Engg (2nd Edition) : Kothari & Nagarath, TMH
2. Electrical Technology (Vol-I) : B.L Theraja & A K Theraja, S.Chand

REFERENCE BOOKS:

1. Electrical Engineering Fundamentals: Deltoro, PHI
2. Network Analysis: Valkenburg, PHI

Note:

Eight questions are to be set in all by the examiner taking at least one question from each unit. Students will be required to attempt five questions in all.

ME - 101 **ELEMENTS OF MECHANICAL ENGINEERING**
(Common for all Branches)

L	T	P	Credits			
3	1	--	4	**Class Work**	**:**	50 Marks
				Examination	**:**	100 Marks
				Total	**:**	150 Marks
				Duration Examination	**:**	3 Hours

Unit-I: Properties of Steam & Boilers: Formation of steam at constant pressure, Thermodynamics properties of steam, Condition of steam, Steam tables, Measurement of dryness fraction by throttling calorimeter, Classification of boilers, Comparison of water and fire tube boilers mounting and accessories with their functions, Constructional and operational details of Cochran and Babcock and Wilcox boilers, Problems.

Unit-II: Steam Turbines and Condensers: Classification of turbines, Working principle of impulse and reaction turbine, Compounding of impulse turbine, Comparison of impulse and reaction turbines, Types of condensers, Cooling ponds and cooling towers, Condenser and vacuum efficiencies.

Unit-III: I.C. Engines and Gas Turbines: Introduction, Classification, Constructional details and working of two-stroke and four-stroke diesel and petrol engines, Otto, Diesel and Dual cycles, Working principle of gas turbine, Constant pressure gas turbine cycle.

Unit-IV: Water Turbines, Pumps and Hydraulic Devices: 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, Hydraulic jack and lift.

Unit-V: Simple Lifting Machines: Definition of machine, Velocity ratio, Mechanical advantage, Efficiency, Laws of machines, Reversibility of machine, Wheel and axle, Differential pulley block, Single, double and triple start worm and worm wheel, Single and double purchase winch crabs, Simple and compound screw jacks. Problems.

Unit-VI: Power Transmission Methods and Devices: Introduction to Power transmission, Belt drive, Rope drive, Chain drive, Pulley, Gear drive, Types of gears, Gear train, Clutches, Types and function of clutches, Types and function of brakes, Power measurement by dynamometer, Types of dynamometers.

Unit-VII: Stresses and Strains: Introduction, Concept & types of Stresses and strains, Poison's ratio, stresses and strains in simple and compound bars under axial loading, Stress-strain diagrams, Hooks law, Elastic constants & their relationships, Principle stresses & strains and principal- planes, Mohr's circle of stresses. Numerical problems.

Unit-VIII: Bending Moment & Shear Force: Definitions, SF and BM diagrams for cantilever and simply supported beam. Calculation of maximum SF, BM and point of contra-flexure under the loads of (i) concentrated load (ii) uniformly distributed load (iii) combination of concentrated and uniformly distributed loads. Problems.

TEXT BOOKS:

1. Strength of Materials - G.H. Ryder, Pub.- ELBS.
2. Hydraulic and Fluid Mechanics – Modi and Seth, Pub. – Standard Book House, New Delhi
3. Engineering Thermodynamics – C.P. Arora, Pub. - TMH, New Delhi
4. Thermal Engineering – A.S. Sarad, Pub. - Satya Prakashan, New Delhi.
5. Engineering Mechanics – K.L. Kumar, Pub. - TMH, New Delhi.
6. Theory of Machines – S.S. Rattan, Pub. – TMH, New Delhi.

REFERENCE BOOKS:

1. Strength of Materials – Popov, Pub. - PHI, New Delhi.
2. Hydraulic Machines – Jagdish Lal, Pub.- Metropolitan, Allahbad.
3. Thermal Science and Engineering – D.S. Kumar, Pub. – Kateria & Sons, New Delhi.

Note:

In the semester examination, the examiner will set eight questions, at least one question from each unit. The students will be required to attend only 5 questions.

ME - 103 **MANUFACTURING PROCESSES**
(Common for all Branches)

L	T	P	Credits
4	-	--	4

Class Work	**:**	50 Marks
Examination	**:**	100 Marks
Total	**:**	150 Marks
Duration Examination	**:**	3 Hours

Unit-I Introduction: Introduction to Manufacturing Processes and their Classification. Industrial Safety; Introduction, Types of Accidents, Causes and Common Sources of Accidents, Methods of Safety, First Aid.

Unit-II Engineering Materials: General Properties and Applications of Engineering Materials, Mild Steel, Medium Carbon Steel, High Carbon Steel, High Speed Steel and Cast Iron.

Unit-III Foundry: Introduction to Casting Processes, Basic Steps in Casting Process, Pattern, Types of Patterns, Pattern Allowances, Risers, Runners, Gates, Moulding Sand and its composition, Sand Preparation, Molding Methods, Core Sands and Core Making, Core Assembly, Mold Assembly, Melting (Cupola) and Pouring, Fettling, Casting Defects and Remedies.

Unit-IV Cold Working (Sheet Metal Work): Sheet Metal Operations, Measuring, Layout Marking, Shearing, Punching, Blanking, Piercing, Forming, Bending and Joining - Advantages and Limitations.

Hot Working Processes: Introduction to Hot Working, Principles of Hot Working Processes, Forging, Rolling, Extrusion, Wire Drawing..

Unit-V Introduction to Machine Tools: Specifications and Uses of commonly used Machine Tools in a Workshop such as Lathe, Shaper, Planer, Milling, Drilling, Slotter, Introduction to Metal Cutting. Nomenclature of a Single Points Cutting Tool and Tool Wear. Mechanics of Chips Formation, Type of Chips , Use of Coolants in machining.

Unit-VI Welding: Introduction to Welding, Classification 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.

Unit-VII Plant Layout, Objectives of Layout, Types of Plant Layout and their Advantages.

TEXT BOOKS:

1. Workshop Technology Vol. I & II - Hazra & Chaudhary, Asian Book Comp., New Delhi.
2. Process and Materials of Manufacture -- Lindberg, R.A. Prentice Hall of India,New Delhi.
3. Principles of Manufacturing Materials and Processes - Campbell, J.S.- McGraw- Hill.

REFERENCE BOOKS:

1. Manufacturing Science - Amitabha Ghosh & Ashok Kumar Malik, - East-West Press.
2. Manufacturing Process and Systems - Ostwald, Munoz , John Wiley.
3. Workshop Technology, Vol. 1, 2 & 3 – Chapman, WAJ, Edward Arnold.

Note:

In the semester examination, the examiner will set eight questions, at least one question from each unit. The students will be required to attend only 5 questions.

PHY – 103 **PHYSICS LAB-I**
(Common for all branches)

L	T	P	Credits
-	-	2	2

Class Work	**:**	25 Marks
Examination	**:**	25 Marks
Total	**:**	50 Marks
Duration Examination	**:**	3 Hours

LIST OF EXPERIMENTS

The experiments in 1st semester will be based mainly upon optics, electrostatics, wave and oscillations which are the parts of the theory syllabus of 1st semester.

1. To find the 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 cauchy's constants of a prism by using spectrometer.
5. To find the wavelength of sodium 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 verify the inverse square law.
12. To find the temperature co-efficient of resistance by using platinum resistance thermometer and Callender and Griffith 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. Worshnop 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).

Note:

Students will be required to perform at least 10 experiments out of the list in a semester.

CH – 103 CHEMISTRY LAB

L	T	P	Credits
-	-	2	2

Class Work	**:**	25 Marks
Examination	**:**	25 Marks
Total	**:**	50 Marks
Duration Examination	**:**	3 Hours

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 melting & eutectic point for a two component system by using method of cooling curve.
5. Determination of viscosity of lubricant by Red Wood viscometer (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 an oil.
9. Estimation of calcium in lime stone and dolomite.
10. Determination of concentration of KMnO4 solution spectrophotometerically.
11. Determination of strength of HCl solution by titrating it 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.

SUGGESTED BOOKS:

1. A Text Book on Experimental and Calculation – Engineering Chemistry, S.S. Dara, S. Chand & Company (Ltd.)
2. Essential of Experimental Engineering Chemistry, Shashi Chawla, Dhanpat Rai Publishing Company.
3. Theory & Practice Applied Chemistry – O.P. Virmani, A.K. Narula (New Age)

Note:

At least ten experiments are to be performed by the students.

EE-103 ELECTRICAL TECHNOLOGY LAB

L	T	P	Credits
-	-	2	2

Class Work	**:**	25 Marks
Examination	**:**	25 Marks
Total	**:**	50 Marks
Duration Examination	**:**	3 Hours

LIST OF EXPERIMENTS

1. To verify KCL and KVL.
2. To verify Thevenin's & Norton's Theorems.
3. To verify maximum power transfer theorem in D.C. Circuit & A.C circuit.
4. To verify reciprocity & Superposition theorems.
5. To study frequency response of a series R-L-C circuit and determine resonant frequency & 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 & 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 plot V-curve of a synchronous motor.
10. To perform O.C. and S.C. tests of a three phase induction motor.
11. To study various type of meters.
12. Measurement of power by 3 voltmeter / 3 ammeter method.
13. Measurement of power in a 3 phase system by two watt meter method.

Note:
1 At least 10 experiments are to be performed by students in the semester.
2 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 Dept. as per the scope of the syllabus of EE - 101.

CSE-103 C Programming Lab

L	T	P	Credits
-	-	2	2

Class Work	**:**	25 Marks
Examination	**:**	25 Marks
Total	**:**	50 Marks
Duration Examination	**:**	3 Hours

REPRESENTATIVE PROGRAMMING PROBLEMS:

1. Write a program to find the largest of three numbers. (if-then-else)
2. Write a program to find the largest number out of ten numbers (for-statement)
3. Write a program to find the average mail height & average female heights in the class (input is in form of sex code, height).
4. Write a program to find roots of quadratic equation using functions and switch statements.
5. Write a program using arrays to find the largest and second largest no. out of given 50 nos.
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.
9. Write a program to sort numbers using the Quicksort Algorithm.
10. Represent a deck of playing cards using arrays.
11. Write a program to check that the input string is a palindrome or not.

Note:

At least 5 to 10 more exercises to be given by the teacher concerned.

ME 105 ENGINEERING GRAPHICS AND DRAWING

L	T	P	Credits			
-	-	4	4	**Class Work**	**:**	50 Marks
				Examination	**:**	100 Marks
				Total	**:**	150 Marks
				Duration Examination	**:**	3 Hours

Unit-I Various types of projections, First and Third angle systems of orthographic projections. Projection of Points in different quadrants.

Unit-II Projections of Straight Lines – parallel to one or both reference planes, contained by one or both planes, perpendicular to one of the planes, inclined to one plane but parallel to the other planes, inclined to both the planes, true length of a line and its inclination with reference planes, traces of a line.

Unit-III Projections of Planes – parallel to one reference plane, inclined to one plane but perpendicular to the other, inclined to both reference planes.

Unit-IV Projections of Polyhedra Solids and Solids of Revolution - in simple positions with axis perpendicular to a plane, with axis parallel to both planes, with axis parallel to one plane and inclined to the other, Projections of sections of Prisms, Pyramids, Cylinders and Cones. True shape of section. Development of surfaces of various solids.

Unit-V Isometric projections - introduction, isometric scale, Isometric views of plane figures, prisms, pyramids and cylinders.

Unit-VI Orthographic drawings of Bolts and Nuts, Bolted Joints, Screw threads, Screwed Joints.

Unit-VII Free Hand Sketching - Orthographic Views from Isometric, Views of Simple Machine Components such as Brackets, Bearing Blocks , Guiding Blocks and Simple Couplings.

Note: Some simple exercises may be attempted with AUTOCAD.

TEXT BOOKS:

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

REFERENCE BOOKS:

1. Engineering Graphics and Drafting : P.S. Gill, Millennium Edition, S.K. Kataria and Sons.
2. A Text Book of Engineering Drawing : S.B. Mathur, Second Revised and Enlarged Edition 2000, Vikas Publishing House.
3. Engineering Graphics using AUTOCAD 2000 : T. Jeyapoovan, First Edition 2002, Vikas Publishing House.

ME-107 WORKSHOP PRACTICE

L	T	P	Credits
-	-	2	2

Class Work	**:**	25 Marks
Examination	**:**	25 Marks
Total	**:**	50 Marks
Duration Examination	**:**	3 Hours

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, shaper 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 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 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 on a milling machine.

Note:

1. **At least ten experiments/ jobs are to be performed/ prepared by students in the semester.**
2. **At least 8 experiments/ jobs should be performed / prepared from the above list, remaining two may either be performed/ prepared from the above list or designed and set as per the scope of the syllabus of Manufacturing Processes.**

ME - 109 ELEMENTS OF MECHANICAL ENGINEERING LAB

L	T	P	Credits
-	-	2	2

Class Work	**:**	25 Marks
Examination	**:**	25 Marks
Total	**:**	50 Marks
Duration Examination	**:**	3 Hours

LIST OF EXPERIMENTS

1. To study Cochran & Babcock & Wilcox boilers.
2. To study the working & function of mountings & accessories in boilers.
3. To study 2-Stroke & 4-Stroke diesel engines.
4. To study 2-Stroke & 4-Stroke petrol engines.
5. To calculate the V.R., M.A. & efficiency of single, double & triple start worm & worm wheel.
6. To calculate the V.R., M.A. & efficiency of single & double purchase winch crabs.
7. To find the percentage error between observed and calculated values of stresses in the members of a Jib crane.
8. To draw the SF & BM diagrams of a simply supported beam with concentrated loads.
9. To study the simple & compound screw jacks and find their MA, VR & efficiency.
10. To study the various types of dynamometers.
11. To study the constructional features & working of Pelton/Kaplan/Francis.
12. To prepare stress-strain diagram for mild steel & cast iron specimens under tension and compression respectively on a Universal testing machine.
13. To determine the Rockwell / Brinell /Vickers hardness no. of a given specimen on the respective machines.

Note:

1. **Total ten experiments are to be performed in the Semester.**
2. **At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed & set as per the scope of the syllabus of ME – 101: Elements of Mechanical Engineering.**

GES - 101 **ENVIRONMENTAL STUDIES**
(Common for all Branches)

L	T	P	Credits
3	-	-	0

Class Work	**:**	75 Marks
Total	**:**	750 Marks
Duration Examination	**:**	3 Hours

UNIT – I The Multidisciplinary nature of environmental studies, Definition, scope and importance.
Need for Public awareness

UNIT – II Natural Resources:
Renewable and non-renewable resources: Natural resources and associated problems.

(a) Forest resources: Use and over-exploitation: deforestation, case studies, Timber exploitation, mining, dams and their effects and forests tribal people.
(b) Water resources: Use and over-utilization of surface and ground 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, fertilizer-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, land degradation, man induced landslides, soil erosion and desertification.

- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.

UNIT- III Ecosystems:

- Concept of an ecosystem.
- Structure and function of an ecosystem.
- Producers, consumers and decomposers.
- Energy flow in the ecosystem.
- Ecological succession.
- Food chains, food webs 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).

UNIT- IV Biodiversity and its conservations:

- Introduction – Definition: Genetic, species and ecosystem diversity.
- Biogeographically 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.

UNIT – V 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
- Solid waste management: Causes effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution.
- Pollution case studies.
- Disaster management: Floods, earthquake, cyclone and landslides.

UNIT – VI Social issues and the Environment:

(a) From unsustainable to sustainable development
(b) Urban problems related to energy
(c) Water conservation, rain water harvesting, watershed management
(d) Resettlement and rehabilitation of people; its problems and concerns, case studies e) Environmental ethics: Issues and possible solutions
(e) Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, Case studies
(f) Wasteland reclamation
(g) Consumerism and waste products i) Environment Protection Act
(h) Air (Prevention and Control of Pollution) Act
(i) Water (Prevention and Control of Pollution) Act
(j) Wildlife Protection Act m) Forest Conservation Act
(k) Issues involved in enforcement of environmental legislation o) Public awareness

UNIT – VII Human population and the Environment.

Population growth, variation among nations. Population explosion – Family Welfare Programme. Environment and human health.
Human Rights. Value Education. HIV/ AIDS.
Woman and Child Welfare.
Role of Information Technology in Environment and human health. Case Studies.

REFERENCES:

1. Agarwal, K.C. 2001, Environmental Biology, Nidi Pub. Ltd. Bikaner.
2. Bharucha, Franch, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad – 380013, India .
3. Brunner R.C. 1989, Hazardous Waste Incineration, Mc. Graw Hill Inc. 480p.
4. Clark R.S., Marine Pllution, Slanderson Press Oxford (TB).
5. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Pub. House, Mumbai. 1195p.
6. De A.K., Environmenal Chemistry, Wiley Eastern Ltd.
7. Down to Earth, Centre for Science and Environment ®.
8. Gleick, H.P., 1993. Water in Crisis, Pacific Institute for Studies in Dev., Environment & Security, Stockholm Env. Institute, Oxford Univ., Press 473p.

9. Hawkins R.E. Encyclopedia of Indian Natural History, Bomaby Natural History Scociety, Bombay (R).
10. Heywood, V.H. & Watson, R.T. 1995. Global Biodiversity Assessment. Cambridge Univ. Press 1140p.
11. Jadhav, H & Bhosale, V.M. 1995, Environmental Protection and Laws, Himalaya Pub. House, Helhi 284p.
12. Mckinney, M.L. & Schoch, RM 1996, Environmental Sciences Systems & Solutions, Web enhanced Edition 639p.
13. Mhaskar A.K., Mater Hazardous, Tekchno-Sciences Publications (TB).
14. Miller T.G. Jr. Environmental Science, Wadsoworth Publishing Co. (TB).
15. Odum, E.P. 1971, Fundamentals of Ecology, W.B. Saunders Co. USA, 574p.
16. Rao M.N. & Dutta, A.K. 1987, Waste Water Treatment. Oxford & IBH Publ. Co. Pvt. Ltd., 345p
17. Sharma, B.K., 2001, Environmental Chemistry, Goel Publ. House, Meerut.
18. Survey of the Environment, The Hindu (M).
19. Townsend C., Harper J, and Michael Begon, Essentials of Ecology, Blackwell Sciences (TB).
20. Trivedi, R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II Enviro Mdiea (R).
21. Trividi R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol I and II Enviro Media (R).
22. Trividi R.K. and P.K. Goel, Introduction to air pollution, Techno Sciences Pub. (TB).
23. Wagner K.D., 1998, Environmental Management, W.B. Saunders Co. Philadelophia, USA 499p.
24. A text bok environmental education G.V.S. Publishers by Dr. J.P. Yadav.

(M) Magazine (R) Reference (TB) Textbook

Note:

1. **Examiner will set eight questions. Students will be required to attempt five Questions.**
2. **The awards of this paper shall not be counted in the award of the Degree/DMC.**

GES - 103 **ENVIRONMENTAL STUDIES FIELD WORK**
(Common for all Branches)

L	T	P	Credits			
-	-	-	0	**Class Work**	**:**	25 Marks
				Total	**:**	25 Marks

FIELD WORK:

(a) Visit to a local area to document environmental assets – river/ forest/ grassland/ hill/ mountain.
(b) Visit to a local polluted site-Urban/ Rural/ Industrial/ Agricultural.
(c) Study of common plants, insects, birds.
(d) Study of simple ecosystems – pond, river, hill slopes, etc. (Field work equal to 5 lectures hours).

Note:

The awards of this paper shall not be counted in the award of the Degree/DMC.

HUM – 102 COMMUNICATION SKILLS IN ENGLISH

(Common for all Branches except BIO-TECHNOLOGY)

L	T	P	Credits			
3	1	--	4	**Class Work**	**:**	50 Marks
				Examination	**:**	100 Marks
				Total	**:**	150 Marks
				Duration Examination	**:**	3 Hours

This course is designed for the students of Engineering and Technology who need English for specific purposes in specific situations. It aims at imparting the communication skills that are needed in their academic and professional pursuits. This is achieved through an amalgamation of traditional lecture-oriented approach of teaching with the task based skill oriented methodology of learning.

COURSE CONTENT:

Unit-I: Communicative Grammar: Spotting the errors pertaining to nouns, pronouns, adjective and adverbs; Concord - grammatical concord, notional concord and the principle of proximity between subject and verb.

Unit-II: Lexis: Idioms and phrases; Words often confused; One-Word Substitutes; Formation of words (suffixes, prefixes and derivatives); Foreign Words (A selected list).

Unit-III: Oral Communication: Part-A: Introduction to principal components of spoken English – Word-stress patterns, Intonation, 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 discussion (d) Debates (e) Speeches (f) Listening to news bulletins (g) Viewing and reviewing T.V. programmes etc.

Unit-IV: 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.

Unit-V (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

Unit-VI: Technical Writing:

(a) Business Letters, Format of Business letters and Business letter writing
(b) E-mail writing
(c) Reports, Types of Reports and Format of Formal Reports
(d) Press Report Writing

SUGGESTED READING:

1. Language in Use (Upper intermediate Level, Adrian Doff Christopher Jones, Cambridge University Press
2. Common Errors in English, Abul Hashem, 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.

SCHEME OF EXAMINATION:

All questions will be compulsory and will cover all the aspects of the syllabus **except unit V**. There will be sufficient internal choice.

Unit-I: 20 Marks

Questions No. 1 will require the students to carefully read the sentences given and trace the errors, if any, and then supply the correct alternatives/answers.

Unit-II: 20 Marks

Question No. 2 may have four or five parts testing knowledge of different items of vocabulary.

Unit-III: 20 Marks

Question No. 3 will have two parts of 10 marks each from part A and B of the unit. Part A will have content words, form words and sentences for stress marking, transcription and intonation marking respectively. Part B will test students' speaking skills through various oral tasks and activities - debate, group discussion and speech - in written form only.

Note:

Speaking and listening skills will primarily be tested orally through internal assessment.

Unit-IV: 20 Marks

Question No. 4 may have many parts. The questions will be framed to test students' composition skills on the elements prescribed in the unit. For example, the students may be required to develop a hypothetical situation in a dialogue form, or to develop an outline, key expression, graph etc.

Unit-V is for internal assessment only. Unit-VI: 20 Marks

Question No. 5 may have two parts. While the one part may require the students to frame either a press/news report for the print media or write the given business letter, or e-mail a message, the second part will have a theory question on the format of formal report and business letter.

MATH - 102 **MATHEMATICS - II**
(Common for all Branches)

L	T	P	Credits
3	2	-	5

Class Work	**:**	50 Marks
Examination	**:**	100 Marks
Total	**:**	150 Marks
Duration Examination	**:**	3 Hours

Part - A

Matrices & its Applications : Rank of a matrix, elementary transformations, elementary matrices, inverse using elementary transformations, normal form of a matrix, linear dependence and in dependence of vectors, consistency of linear system of equations, linear and orthogonal transformations, eigen values and eigen vectors, properties of eigen values, Cayley - Hamilton theorem and its applications.

Part - B

Ordinary Differential Equations & its 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 differential 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 Legender's linear equations, simultaneous linear equations with constant co-efficients. Applications of linear differential equations to simple pendulum, oscillatory electric circuits.

Part - C

Laplace Transforms and its Applications: Laplace transforms of elementary functions, properties of Laplace transforms, existence conditions, transforms of derivaties, transforms of integrals, multiplication by tn, 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, application to linear differential equations and simultaneous linear differential equations with constant coefficients.

Partial Differential Equations and Its Applications: Formation of partial differential equations, Lagrange's 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 and one dimensional heat equation, two dimensional heat flow, steady state solutions only.

TEXT BOOKS:

1. Advanced Engg. Mathematics F Kreyszig
2. Higher Engg. Mathematics B.S. Grewal

REFERENCE BOOKS:

1. Differential Equations – H.T.H. Piaggio.
2. Elements of Partial Differential Equations – I.N. Sneddon.
3. Advanced Engineering Mathematics – R.K. Jain, S.R.K.Iyengar.
4. Advanced Engg. Mathematics – Michael D. Greenberg.

Note:

Examiner will set eight questions, taking two from Part-A, three from Part-B and three from Part-C. Students will be required to attempt five question taking atleast one from each part.

PHY - 102 **PHYSICS - II**
(Common for all Branches)

L	T	P	Credits
3	1	-	4

Class Work	**:**	50 Marks
Examination	**:**	100 Marks
Total	**:**	150 Marks
Duration Examination	**:**	3 Hours

Part - A

CRYSTAL STRUCTURE: Space Lattice, unit cell and translation vectors, Miller indices, simple crystal structure, Bonding in solids, Experimental x-ray diffraction method, Laue method, powder Method, Point defects in solids, Elementary idea of quarks and gluons.

QUANTUM PHYSICS: Difficulties with Classical physics, Introduction to quantum mechanics-simple concepts, discovery of Planck's constant, Group velocity and phase velocity, Schrodinger wave equations - time dependant and time independent Schrodinger equations, Elementary ideas of quantum statistics.

FREE ELECTION 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.

Part - B

BAND THEORY OF SOLIDS: Origin of energy bands, Kronig, Penney 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 AND PHOTOVOLTAICS: Photoconductivity in insulating crystals, variation with illumination, effect of traps, applications of photoconductivity, photovoltaic cells and their characteristics.

MAGNETIC PROPERTIES OF SOLIDS: Atomic magnetic moments, orbital diamagnetism, Classical theory of paramagnetism, ferro magnetism - molecular fields and domains.

SUPER CONDUCTIVITY: Introduction (experimental survey), Meissner effect, London equation.

TEXT BOOKS:

1. Introduction to Solid State Physics (VII Ed.) – Charles Kittel (John Wiley).
2. Quantum Mechanics – Powell and Crasemann (Oxford & IBH)
3. Fundamentals of Solid State Physics – B. S. Saxena, R. C. Gupta and P. N. Saxena (Pragati Prakashan).

REFERENCE BOOKS:

1. Sold State Physics – Pillai (New Age).
2. A text book of Engg. Physics – Avadhanulu and Kshirsagar (S.Chand)
3. Quantum Mechanics – Ghatak & Loknathan.

Note:

The Examiners will set eight questions, taking four from each part. The students will be required to attempt five questions in all selecting at least two from each part. All questions will carry equal marks.

PHY – 104 **PHYSICS LAB. - II**
(Common for all Branches)

L	T	P	Credits
-	-	2	2

Class Work	**:**	25 Marks
Examination	**:**	25 Marks
Total	**:**	50 Marks
Duration Examination	**:**	3 Hours

LIST OF EXPERIMENTS

The experiments in Second semester will be based upon electricity, Magnetism, Modern Physics and Solid State Physics which are the parts of theory syllabus.

1. To find the low resistance by carey - Foster's bridge.
2. To find the resistance of a galvanometer by Thomson's constant deflection method using a post office box.
3. To find the value of high resistances by Substitution method.
4. To find the value of high resistances 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 apparatus.
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 bridge.
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. Worshnop 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).

Note:

Students will be required to perform atleast 10 experiments out of the list in a semester.

GP - 102 **GENERAL PROFICIENCY**
(Common for all Branches)

L	T	P	Credits			
-	-	-	2	**Class Work**	**:**	50 Marks
				Total	**:**	150 Marks

The purpose of this course is to inculcate a sense of professionalism in a student along with personality development in terms of quality such as receiving, responding, temperament, attitude and outlook. The student efforts will be evaluated on the basis of his/ her performance / achievements in different walks of life.

The evaluation will be made by the panel of experts/ teachers, preferably interdisciplinary to be appointed by the Vice- Chancellor of the University on recommendation of the Dean Academic Affairs. A Faculty Counselor will be attached to a group of students which will remain associated with him /her during the entire period of the degree program in the University. Each faculty member will serve as a faculty counselor. They will act like a local guardian for the students associated with him / her and will help them in terms of career guidance, personal difficulties.

A. The student will present a written report before the committee with following in view:

The student will present before the committee his/her achievements during the current academic session in the form of a written report highlighting followings:

I. Academic Performance --------
II. Extra Curricular Activities **(4 Marks)** III Technical Activities

NOTE:

Report submitted by the students should be typed on both sides of the paper.

B. A student will support his/her achievement and verbal & communicative skill through presentation before the committee. **(20 Marks)**

C. Faculty Counselor Assignment (10 Marks)

It will be the duty of the student to get evaluated by respective faculty counselor and to submit the counselor assessment marks in a sealed envelope to the committee.

A counselor will assess the student which reflects his/her learning graph including followings:

I. Discipline throughout the year
II. Sincerity towards study