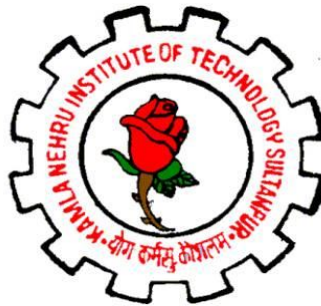


KAMLA NEHRU INSTITUTE OF TECHNOLOGY SULTANPUR (UP)

(An Academic Autonomous Govt. Institute under G.B.T.U. Lucknow)



SYLLABUS

[Effective from session 2013-14]

(First Year)

(Common to All Branches of Engineering)

STUDY & EVALUATION SCHEME

B. Tech. First Year (common to all B. Tech. Courses)

(Effective from the session 2013-14)

YEAR – I SEMESTER – I

S. No.	Course Code	Subject	Periods			EVALUATION SCHEME				
						Sessional Exam			ESE	TOTAL
			L	T	P	CT	TA	Total		
THEORY										
1.	EAS-103	Mathematics-I	3	1	0	30	20	50	100	150
2.	EAS-101	Engg. Physics-I	2	1	0	15	10	25	50	75
3.	EAS-102/ EME-102	Engg. Chemistry/ Eng. Mechanics	3	1	0	30	20	50	100	150
4.	EEE-101/ ECS-101	Electrical Engg./ Computer Concepts & Programming in C	3	1	0	30	20	50	100	150
5.	EEC-101/ EAS-104	Electronics Engineering /Professional Communication	3	1	0	30	20	50	100	150
6.	EME-101/ EAS-105	Manufacturing Processes/ Environment & Ecology	2	0	0	15	10	25	50	75
PRACTICAL										
7.	EAS-152/ EME-152	Engg. Chemistry Lab/ Engg. Mechanics Lab	0	0	2	10	10	20	30	50
8.	EEE-151/ ECS-151	Electrical Engg. Lab/ Computer Programming Lab	0	0	2	10	10	20	30	50
9.	EWS-151/ ECE-151	Workshop Practice/ Computer Aided Engg. Graphics	0	1	3	10	10	20	30	50
10.	EAS-151/ EAS-154	Physics Lab/ Professional Communication Lab	0	0	2	10	10	20	30	50
11.	GP-101	General Proficiency	—					50		50
TOTAL									1000	

- L - Lecture
T - Tutorial Practical
CT - Cumulative Test
TA - Teacher's Assessment
ESE - End Semester Exam

STUDY & EVALUATION SCHEME

B. Tech. First Year (common to all B. Tech. Courses)

(Effective from the session 2013-14)

YEAR – I SEMESTER – II

S. No.	Course Code	Subject	Periods			EVALUATION SCHEME				TOTAL
						Sessional Exam			ESE	
			L	T	P	CT	TA	Total		
THEORY										
1.	EAS-203	Mathematics-II	3	1	0	30	20	50	100	150
2.	EAS-201	Engg. Physics-II	2	1	0	15	10	25	50	75
3.	EAS-202/ EME-202	Engg. Chemistry/ Eng. Mechanics	3	1	0	30	20	50	100	150
4.	EEE-201/ ECS-201	Electrical Engg./ Computer Concepts & Programming in C	3	1	0	30	20	50	100	150
5.	EEC-201/ EAS-204	Electronics Engineering /Professional Communication	3	1	0	30	20	50	100	150
6.	EME-201/ EAS-205	Manufacturing Processes/ Environment & Ecology	2	0	0	15	10	25	50	75
PRACTICAL										
7.	EAS-252/ EME-252	Engg. Chemistry Lab/ Engg. Mechanics Lab	0	0	2	10	10	20	30	50
8.	EEE-251/ ECS-251	Electrical Engg. Lab/ Computer Programming Lab	0	0	2	10	10	20	30	50
9.	EWS-251/ ECE-251	Workshop Practice/ Computer Aided Engg. Graphics	0	1	3	10	10	20	30	50
10.	EAS-251/ EAS-254	Physics Lab/ Professional Communication Lab	0	0	2	10	10	20	30	50
11.	GP-201	General Proficiency	—					50		50
TOTAL									1000	

- L - Lecture
T - Tutorial Practical
CT - Cumulative Test
TA - Teacher's Assessment
ESE - End Semester Exam

Engineering Mathematics - I

(EAS-103)

L	T	P
3	1	0

Unit - 1: Differential Calculus - I

Introduction to successive differentiation, Leibnitz's theorem, Partial derivatives, Euler's theorem for homogeneous functions, Total derivatives, Change of variables, Curve tracing: Cartesian and Polar coordinates.

Unit - 2: Differential Calculus - II

Taylor's and Maclaurin's Theorems, Expansion of function of several variables, Jacobian, Approximation of errors, Extrema of functions of several variables, Lagrange's method of multipliers (Simple applications).

Unit - 3: Linear Algebra

Inverse of a matrix by elementary transformations, Rank of a matrix (Echelon & Normal form), Linear dependence and Independence, Consistency of linear system of equations and their solution, Symmetric, Skew-symmetric and Orthogonal matrices. Hermitian, Skew-Hermitian and Unitary matrices. Characteristic equation, Eigen values and eigen vectors, Cayley-Hamilton Theorem, Application of matrices to engineering problems.

Unit - 4: Multiple Integrals

Double and triple integrals, Change of order of integration, Change of variables, Application of integration to lengths, Volumes and Surface areas – Cartesian and Polar coordinates. Beta and Gamma functions, Dirichlet's integral and applications.

Unit - 5: Vector Calculus

Point function, Gradient, Divergence and Curl and their physical interpretations, Vector identities, Directional derivatives. Line, Surface and Volume integrals, Applications of Green's, Stoke's and Gauss divergence theorems (without proofs), Area using Green's theorem.

Text Books:

1. B. V. Ramana, Higher Engineering Mathematics, Tata Mc Graw- Hill Publishing Company Ltd.
2. R.K.Jain & S.R.K. Iyenger, Advance Engineering Mathematics, Narosa Publishing House.
3. Babu Ram, Engineering Mathematics, Vol.- I, Pearson Education.

Reference Books:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers.
2. E. Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons.
3. Peter V. O' Neil, Advanced Engineering Mathematics, Thomas (Cengage) Learning.
4. Thomas & Finley, Calculus, Narosa Publishing House
5. Rukmangadachari, Engineering Mathematics – I, Pearson Education.

ENGINEERING PHYSICS-I

(EAS-101)

L	T	P
2	1	2

Unit – I

06 Hrs.

Relativistic Mechanics

Inertial & non-inertial frames, Michelson- Morley experiment, Einsteins postulates, Lorentz transformation equations, Length contraction & Time dilation, Addition of velocities; Variation of mass with velocity, Mass energy equivalence.

Unit - II

06 Hrs.

Modern Physics

Wave Mechanics: Wave- particle duality, de-Broglie matter waves, Phase and Group velocities, Davisson-Germer experiment, Heisenberg uncertainty principle and its applications, Wave function and its significance, Schrödinger's wave equation – particle in one dimensional potential box, Eigen values and Eigen function.

Unit - III

10 Hrs

Statistical Mechanics

Phase space ,The probability of a distribution, most probable distribution, Maxwell Boltzmann Statistics, Application to find out energy and velocity distribution among the molecules of an ideal gas, derivation of average velocity, R.M.S. velocity, and most probable velocity in the above case. Bose Einstein Statistics, Application to Black body radiation, distribution law of energy, Plank's radiation formula and Stefan's law, Fermi-Dirac statistics, Application to electrons in metals (energy distribution, Fermi energy)

Unit - IV

08Hrs.

Modern Optics

Laser: Spontaneous and stimulated emission of radiation, population inversion, concept of 3 and 4 level Laser, construction and working of Ruby, He-Ne lasers and laser applications.

Fiber Optics: Fundamental ideas about optical fiber, Propagation mechanism, Acceptance angle and cone, Numerical aperture, Single and Multi Mode Fibers

Holography: Basic Principle of Holography, Construction and reconstruction of Image on hologram and applications of holography.

Text Books/ Reference Books:

1. Concepts of Modern Physics - Aurthur Beiser (Mc-Graw Hill)
2. Introduction to Special theory of - Robert Resnick - Wielly
3. Optical Fibre & Laser - Anuradha De. (New Age)
4. Optics –Aloy Ghatak (Tata McGraw Hill Education Private Ltd. New Delhi)
5. Optics - Brijlal & Subramanian (S. Chand)
6. Applied Physics for Engineers- Neeraj Mehta (PHI Learning, New Delhi)

Engineering Chemistry (EAS-102/EAS202)

L	T	P
3	1	2

Unit 1 : CHEMICAL BONDING AND STATES OF MATTER (08 Hrs)

Molecular orbital theory and its applications in diatomic molecules. Band theory of solids and conducting behavior of substances. Amorphous and crystalline substances. Liquid crystals and its applications. Types of unit cell, space lattices(only cubes), calculation of density of unit cell. Bragg's equation and application. One dimensional imperfection in solids. Structure , properties & applications of diamond, graphite & fullerenes.

Unit 2: REACTION KINETICS, PHASE RULE AND ELECTRO-CHEMISTRY (07 Hrs)

Order and Molecularity of reactions. Integrated rate equations for first and second order reactions. Theories of reaction rates. Phase rule and its application to one component water system . Equilibrium potential, electrochemical cells, galvanic and concentration cells. Corrosion and its prevention. Fuel cells.

Unit 3: STRUCTURE AND MECHANISTIC ASPECT OF ORGANICS (08 Hrs)

Classification of organic compounds. Reactions of organic molecules. Reaction intermediates their structure and stability. Mechanism and energy profile of nucleophilic substitution reactions (SN^1 & SN^2). Stereochemistry with special reference to optical activity and optical isomerism. Resolution of racemic compounds. Absolute and relative configurations. Geometrical isomerism and EZ nomenclature. Conformational isomerism of n- butane molecule.

Unit 4: POLYMERS, ORGANOMETALICS AND CHEMICAL THERMODYNAMICS (07 Hrs)

Polymerisation and classification. Thermoplastic and thermosetting resins. Elastomers and synthetic fibres. Molecular weight of polymers. Conducting and biodegradable polymers. Grignard and Gilman reagents and its applications. Thermodynamic system, surrounding and boundary. State functions & thermodynamic processes. First law of thermodynamics & applications (Hess's law). General metallurgical operations and metallurgy of Iron & Aluminium (Fe & Al).

Unit 5: ANALYTICAL AND INSTRUMENTAL METHODS OF CHEMICAL ANALYSIS AND ENGINEERING MATERIALS. 10Hrs

Titrimetric analysis with reference to acid –base, redox, precipitation, and complexometric titrations. Basic principles, simple applications & instrumentation set up involved in UV- visible, IR & NMR (1H) spectroscopy. Cement, composition & manufacture of Portland cement. Setting & hardening of cement. Hard water and causes of hardness. Hard water and boiler problems. Water treatment processes- Ls Process, zeolite process, ion exchange process & Calgon conditioning. Potable water and reverse osmosis. Fuels and classification of fuels. Analysis of coal. Determination of calorific values by Bomb Calorimeter. Biogas & biomass. Elementary idea of Insulators, Lubricants & Nanomaterials

Text books

1. Engineering Chemistry by Jain & Jain; Dhanpat Rai & co.
2. Theory & Practicals of Engg- Chemistry by Shashi & Chawla; Dhanpat Rai & Co
3. Chemistry for Engineers by S. Vairam and Suba Ramesh., Wiley India

Reference books

1. Chemistry (9th ed), by Ramond Chang, Tata Mcgraw- Hill Publishing Company Limited, New Delhi
2. Chemistry concepts and applications by Steven S. Zumdahl; cengage learning
3. Chemistry in Engineering & Technology Vol 1 & 2 by J C Kuriacose & J Rajaram.
4. Tata Mcgraw- Hill Publishing Company Limited, New Delhi
5. Engineering Chemistry by B SIVASANKAR, Tata Mc graw Hill Publishing Company Limited, New Del
6. Organic chemistry 6th ed by Morrison & Boyd; Pearson Education

7. Physical Chemistry by Gordon M. Barrow; Mc- Graw Hill Publishing Company Limited, New Delhi
8. Organic Chemistry, Volume 1 (6th ed) & 2 (5th ed) by I. L. Finar; Pearson Education
9. Physical Chemistry by Peter Atkins & Julio de Paula; Oxford University Press
10. Modern Inorganic Chemistry By prof R P Rastogi, Singh & Nath; United Book Depot, Allahabad
11. Organic Chemistry- Wade,L.G. and Singh, M.S.; Pearson Education, Pvt. Ltd.

Engineering Mechanics

EME-102/202

L	T	P
3	1	2

Unit 1: Force, Moment, Stress and Strain

Idealization in Mechanics, Two Dimensional Force Systems, Equivalent force systems, Equations of Equilibrium. Free body Diagram, Simple Stress and Strains, Hook's law and its application to axially loaded members, force of friction, belt Friction, Wedge friction, Screw friction and Rolling Friction

Unit 2: Structures

Introduction of Truss, Analysis of Plain Truss, Method of Joints, Methods of sections, Introductions of Beams, Shear force and bending Moment in Statically determinate Beams, Shear Force and Bending Moment Diagrams.

Unit 3: Centroid and Moment of inertia

Introduction, Centroid, Centre of mass and Centre of gravity, Moment of inertia of area, product of Inertia of Area, Parallel axes Theorems, perpendicular axes Theorem, Transformation of moment of Inertia, Principal Axes and Principal moment of inertia, Mass moment of inertia of rod, Disc cylinder and Sphere.

Unit 4: Methods of Virtual Work

Introduction, Work of a Force, Virtual Displacement, Virtual Work, Principal of Virtual Work, Potential Energy and equilibrium, Stability of equilibrium.

Unit 5: Kinematics and Kinetics of particle

Introduction, Determination of Components of displacement, Velocity and acceleration in Cartesian and polar co-ordinates, Normal and Tangential Components of Acceleration for given path. Newton's Second law of motion and D'Alemberts principle, Work and Energy, Impulse and Momentum, Applications

Text/ Reference Books

1. Shames, Irving H. Engineering Mechanics, PHI New Delhi.
2. S Timoshenko, D H Young, JV Rao, Engineering Mechanics, Tata Mc Graw – Hill Publishing Company Limited New Delhi
3. F.P. Beer and E.R. Jhonston, Engineering Mechanics, Statics, Tata Mc Graw – Hill Publishing Company Limited New Delhi
4. R.C. Hibbler, Engineering Mechanics, Pearson Press.

ELECTRICAL ENGINEERING
EE 101/EEE 201

L T P
3 1 0

Unit-I

D.C. Circuit Analysis and Network Theorems:

Circuit Concepts: Concept of Network, Active & Passive elements, voltage and current sources, concept of linearity and linear network, unilateral and bilateral elements, R, L and C as linear elements, source transformation.

Kirchhoff's Laws: loop and nodal methods of analysis, star-delta transformation and vice versa; Network Theorems: Superposition, Thevenin's, Norton's and Maximum Power Transfer Theorems (Simple Numerical problems) (9)

Unit-II

Steady State Analysis of Single Phase AC Circuits:

AC Fundamental: Sinusoidal, Square and triangular waveforms-average and effective values, form and peak factor, concept of phasors, phasor representation of sinusoidal voltage and current. Analysis of series, parallel and series-parallel RLC Circuits, resonance in series and parallel circuits, bandwidth and quality factor, apparent, active and reactive powers, power factor, causes and problems of low power factor, concept of power factor improvement (simple numerical problems). (8)

Unit-III

Three phase AC Circuits:

Three phase systems—its necessity and advantages, star-delta connections, balanced supply and load, line and phase voltage/current relationship, three-phase power and its measurement with one and two wattmeter methods (simple numerical problems). (3)

Measurement Instruments:

Types of instruments, construction and working principles of PMMC and moving iron type voltmeters & ammeters, single phase dynamometer type wattmeter, induction type energy meter. (4)

Unit-IV

Magnetic Circuit:

Magnetic circuit concepts, analogy between electric & magnetic circuits, magnetic leakage, B-H curve, hysteresis and eddy current losses, mutual coupling. (3)

Single Phase Transformer:

Principles of operation, construction, e.m.f. equation, equivalent circuit, power losses, efficiency (simple numerical problems), introduction to auto transformer. (3)

Introduction to Power System:

Definition and general layout of power system. Need of earthing of equipments and devices. (2)

Unit-V

Electrical Machines:

Principles of electro-mechanical energy conversion.

DC Machines: Types, e.m.f. equation of generator, torque equation of motor.

Three Phase Induction Motor: Types, Principle of operation, slip torque characteristics, applications (numerical problems related to slip only).

Single Phase Induction Motor: Principle of operation and introduction to methods of starting, applications.

Three Phase Synchronous Machines: Principle of operation of alternator and synchronous motor and their applications (Only theoretical concept) (8)

Text Books:

1. "Principles of Electrical Engineering", V. Del Toro; Prentice Hall International.
2. "Basic Electrical Engineering", D.P. Kothari, I.J. Nagarath; Tata Mc Graw Hill.
3. "Basic Electrical Engineering", S.N. Singh; Prentice Hall International.
4. "Basic Electrical Engineering", D. E. Fitzgerald and A. Gravel Higginbotham; Mc Graw Hill

Reference Books:

1. "Electrical and Electronics Technology", Edward Hughes; Pearson.
2. "Engineering Circuit Analysis", W.H. Hayt & J.E. Kimerly; Mc Graw Hill.
3. "Basic Electrical Engineering", C.L. Wadhwa; New Age International.
4. "Basic Electrical Engineering", T.K. Nagsarkar, M.S. Shukhija; Oxford University Press.

Computer System and Programming in C

ECS-101/ECS-201

L	T	P
3	1	2

Unit1 (10 Lectures)

Basics of Computer: Introduction to digital computer, basic operations of computer, functional components of computer, Classification of computers. Introduction to operating system: [DOS, Windows, Linux and Android] purpose, function, services and types.

Number system : Binary, octal and hexadecimal number systems, their mutual conversions, Binary arithmetic.

Basics of programming: Approaches to Problem Solving, Concept of algorithm and flow charts, Types of computer languages:- Machine Language, Assembly Language and High Level Language, Concept of Assembler, Compiler, Loader and Linker.

Unit2 (8 Lectures)

C Fundamentals: Fundamental data types- Character type, integer, short, long, unsigned, single and double floating point, Storage classes- automatic, register, static and external, Operators and expression using numeric and relational operators, mixed operands, type conversion, logical operators, bit operations, operator precedence and associativity.

Fundamentals of C programming: Structure of C program, writing and executing the first C program, components of C language. Standard I/O in C.

Unit3 (10 Lectures)

Control Structure: Applying if and switch statements, nesting if and else, use of break and default with switch, program loops and iterations: use of while, do while and for loops, multiple loop variables, assignment operator, use of break and continue statements.

Functions: Introduction, types of functions, functions with array, recursive functions.

Unit 4 (6 Lectures)

Advance Features of C: Array notation and representation, manipulating array elements, using multi dimensional arrays, Structure, union, enumerated data types

Unit 5 (8 Lectures)

Pointers: Introduction, declaration, applications, File handling, standard C preprocessors, defining and calling macros, conditional compilation, passing values to the compiler.

Text Books:

1. Computer Concepts and Programming in C by Vikas Gupta, Wiley India Publication
2. C programming by Kernighan and Ritchie, PHI
3. Computer Concepts and Programming in C, E Balaguruswami, McGraw Hill

Reference Books:

1. Problem Solving and Program Design in C, by Jeri R. Hanly, Elliot B. Koffman, Pearson Addison-Wesley, 2006.
2. Computer Science- A Structured Programming Approach Using C, by Behrouz A. Forouzan, Richard F. Gilberg, Thomson, Third Edition [India Edition], 2007.

ELECTRONICS ENGINEERING

EEC-101/ EEC-201

L	T	P
3	1	0

Unit-I (10 pds)

Semiconductor Diodes and Applications

p-n junction, depletion layer v-i characteristics, ideal and practical, diode resistance, capacitance diode ratings (average current, repetitive peak current, peak-inverse voltage)

p-n junction as rectifiers (half wave and full wave)

filter (Shunt capacitor filter), calculation of ripple factor and load regulation

clipping circuits, clamping circuits, voltage multipliers

Breakdown diodes

breakdown mechanism (zener and avalanche),

breakdown characteristics, zener resistance, zener diode ratings

zener diode application as shunt regulator

Unit-II (08 pds)

Bipolar Junction Transistor (BJT)

basic construction, transistor action

CB, CE and CC configurations, input/ output characteristics

biasing of transistors, fixed bias, emitter bias, potential divider bias, comparison of biasing circuits

graphical analysis of CE amplifier, concept of voltage gain, current gain, h-parameter model (low freq.)

computation of A_i , A_v , R_i , R_o of single transistor CE amplifier configuration

Unit-III (10 pds)

Field Effect Transistor (FET)

JFET: Basic construction, principle of working, concept of pinch-off

maximum drain saturation current, input and transfer characteristics

characteristic equation, CG, CS and CD configurations, fixed and self biasing of JFET amplifier

MOSFET: depletion and enhancement type MOSFET- construction, operation and characteristics

Operational Amplifier (Op-Amp)

concept of ideal operational amplifier, ideal and practical Op-Amp parameters

inverting, non-inverting and unity gain configurations

applications of Op-Amp as adders, difference amplifiers, integrators and differentiator

Unit-IV (07 pds)

Switching Theory and Logic Design (STLD)

number system, conversion of bases (decimal, binary, octal and hexadecimal numbers)

addition and subtraction, fractional numbers, BCD numbers

Boolean algebra, logic gates, concept of universal gates

canonical forms, minimization using K-map (don't care conditions also)

Unit-V (05 pds)

Electronics Instruments:

working principle of digital voltmeter, digital multimeter (block diagram approach), CRO (its working with block diagram), measurement of voltage, current, phase and frequency using CRO

Books and references:

1. Robert L. Boylestad/ Louis Nashelsky "Electronic Devices and Circuit Theory", 9th Edition, Pearson Education 2007
2. Devid A. Bell "Electronic Devices and Circuits", 5th Edition, OXFORD University Press 2008
3. Jacob Millman/ Christos C. Halkias/ Satyabrata Jit "Electronics Devices and Circuits", 3rd Edition, TMH 2008
4. Morris Mano "Digital Computer Design", PHI 2003
5. H.S. Kalsi "Electronic Instrumentation", 2nd Edition, TMH 2007

PROFESSIONAL COMMUNICATION

EAS-104/EAS-204

L	T	P
3	1	2

Unit - I Basics of Technical Communication

Technical Communication: features; Distinction between General and Technical communication; Language as a tool of communication; Levels of communication: Interpersonal, Organizational, Mass communication; The flow of Communication: Downward, Upward, Lateral or Horizontal (Peer group); Importance of technical communication; Barriers to Communication.

Unit - II Constituents of Technical Written Communication

Words and Phrases: Word formation. Synonyms and Antonyms; Homophones; Select vocabulary of about 500-1000 New words; Requisites of Sentence Construction: Paragraph Development: Techniques and Methods -Inductive, Deductive, Spatial, Linear, Chronological etc; The Précis writing- various steps.

Unit - III Business Communication

Principles, Sales & Credit letters;
Claim and Adjustment Letters; Job application and Resumes.
Reports: Types; Significance; Structure, Style & Writing of Reports.
Technical Proposal; Parts; Types; Writing of Proposal; Significance.
Negotiation & Business Presentation skills

Unit - IV Soft Skills & Presentation Strategies

Interpersonal Communication: Methods, Team- work, **Skills:** Empathy, Emotional Intelligence, empathy and listening skills. **Soft-skills:** Time Management; Attitude; Responsibility ; Speaking with confidence: Methodologies; Elements of speech; Kinesics (Body Language); Dimensions of Speech: Syllable; Accent; Pitch; Rhythm; Intonation; Paralinguistic features of voice.

Unit - V Value- Based Text Readings

Following essays form the suggested text book with emphasis on Mechanics of writing,

- (i) Humanistic and Scientific Approaches to Human Activity by Moody E. Prior
- (ii) The Language of Literature and Science by A.Huxley
- (iii) Man and Nature by J.Bronowski
- (iv) The Social Function of Literature by Ian Watt
- (v) Science and Survival by Barry Commoner
- (vi) The Mother of the Sciences by A.J.Bahm
- (vii) The Effect of Scientific Temper on Man by Bertrand Russell.

Text Book

1. Improve Your Writing ed. V.N. Arora and Laxmi Chandra, Oxford Univ. Press, 2001, New Delhi. .
2. Technical Communication – Principles and Practices by Meenakshi Raman & Sangeeta Sharma, Oxford Univ. Press, 2007, New Delhi.

Reference Books

1. Communication Skills for Engineers and Scientists, Sangeeta Sharma et.al. PHI Learning Pvt.Ltd, 2011, New Delhi.
2. Personality Development & Soft Skills, Barun K.Mitra, Oxford University Press, 2012 New Delhi.

3. Business Correspondence and Report Writing by Prof. R.C. Sharma & Krishna Mohan, Tata McGraw Hill & Co. Ltd., 2001, New Delhi.
4. Word Power Made Easy by Norman Lewis, W.R.Goyal Pub. & Distributors, 2009, Delhi.
5. Developing Communication Skills by Krishna Mohan, Meera Bannerji- Macmillan India Ltd. 1990, Delhi.
6. Manual of Practical Communication by L.U.B. Pandey; A.I.T.B.S. Publications India Ltd.; Krishan Nagar, 2013, Delhi.
 7. English Grammar and Usage by R.P.Sinha, Oxford University Press, 2005, New Delhi.
 8. Spoken English- A manual of Speech and Phonetics by R.K.Bansal & J.B.Harrison, Orient Blackswan, 2013, New Delhi.
 9. Business English by Ken Taylor, Orient Blackswan, 2011, New Delhi.

Manufacturing Processes

EME-101/201

L	T	P
2	0	0

Unit-I Basic Metals & Alloys : Properties and Applications

Properties of Materials: Strength, elasticity, stiffness, malleability, ductility, brittleness, toughness and hardness. Elementary ideas of fracture, fatigue & creep.

Ferrous Materials: Carbon steels, its classification based on % carbon as low, mild, medium & high carbon steel, its properties & applications. Wrought iron. Cast iron. Alloy steels: stainless steel, tool steel. Elementary introduction to Heat-treatment of carbon steels: annealing, normalizing, quenching & tempering and case-hardening.

Non-Ferrous metals & alloys: Common uses of various non-ferrous metals & alloys and its composition such as Cu-alloys: Brass, Bronze, Al-alloys such as Duralumin.

Unit-II Introduction to Metal Forming & Casting Process and its applications

Metal Forming: Basic metal forming operations & uses of such as : Forging , Rolling , Wire & Tube-drawing/making and Extrusion, and its products/applications. Press-work, & die & punch assembly, cutting and forming, its applications. Hot-working versus cold-working.

Casting:

Pattern & allowances. Molding sands and its desirable properties. Mould making with the use of a core. Gating system. Casting defects & remedies. Cupola Furnace. Die-casting and its uses.

Unit-III Introduction to Machining & Welding and its applications

Machining: Basic principles of Lathe-machine and operations performed on it. Basic description of machines and operations of Shaper-Planer, Drilling, Milling & Grinding.

Welding: Importance & basic concepts of welding, classification of welding processes. Gas-welding, types of flames. Electric-Arc welding. Resistance welding. Soldering & Brazing and its uses.

Unit-IV Misc. Topics

Manufacturing: Importance of Materials & Manufacturing towards Technological & Socio- Economic developments. Plant location. Plant layout – its types. Types of Production. Production versus Productivity.

Non-Metallic Materials: Common types & uses of Wood, Cement-concrete, Ceramics, Rubber, Plastics and Composite-materials.

Misc. Processes: Powder-metallurgy process & its applications, Plastic-products manufacturing, Galvanizing and Electroplating.

Text books/ Reference books

1. Processes and materials of manufacture Lindberg PHI
2. Manufacturing Engineering and Technology: Kalpakjian and Schmid, Pearson
3. Manufacturing Processes: Kalpakjian and Schmid, Pearson
4. Manufacturing Processes: H N Gupta, R C Gupta Arun Mittal, New Age

ENVIRONMENT AND ECOLOGY

EAS 105/ EAS 205

L	T	P
2	0	0

UNIT-I

Definition, Scope & Importance, Need for Public Awareness. Ecosystem. Effects of Human activities on environment; Agriculture, Housing, Industries, Mining and Transportation. Basics of Environmental Impact Assessment. Sustainable Development.

UNIT-II

Natural Resources; Water Resources- Availability and Quality Aspects. Mineral Resources- Material Cycles- Carbon, Nitrogen and Sulphur cycle. Energy Resources- Conventional and Non conventional sources: Hydroelectric, Fossil fuel based, Nuclear and Solar energy. Hydrogen as an alternative future source of energy.

UNIT-III

Environmental pollution and their effects. Water Pollution; Water borne and Water induced diseases (Arsenic and Fluoride problems in drinking water), Soil pollution, Noise Pollution and Air Pollution. Current environmental issues of importance: Population Growth, Climate Change, Global Warming effects, Urbanization, Nuclear Pollution, Acid Rain and Ozone layer Formation & Depletion.

UNIT- IV

Environmental Protection: Role of Government, Legal aspects. Initiatives by Non- Governmental Organizations, Environmental Education, Women Education.

Textbook

1. Environmental Studies, Dr. R.J. Ranjith Daniels and Dr. Jagdish Krishnaswamy, ISBN 9788126519439, Wiley India Reprint 2010.

Reference Books

1. Environmental Science, 8th Ed ISV, Botkin and Keller, 9788126534142Wiley India.
2. Environment 8th Ed, Peter H. Raven, David M. Hassenzahl, Linda R. Berg, 978-0470945704, Wiley, USA.
3. Fundamentals of Ecology 5th Ed., Eugene Odum, Gary W. Barret, 978-0534420666, Brooks Cole, 2004
4. Concepts of Ecology, 4th Ed., Kormondy Edward J., 978-81-203-1148-0, Prentice Hall India.
5. Environmental science: systems and solutions 3 Michael L. Mac Kinney , Robert Milton Schoch, 9780763709181, Jones & Bartlett Learning, 2003. rd Ed.,
6. Environmental Science, Bernard J. Nebel, Richard T. Right, 9780132854467, Prentice Hall Professional 1993.
7. Environmental Studies, Soli. J Arceivala, Shyam. R Asolekar, 9781259006050, McGrawHill India, 2012.
8. Environmental Studies, D.L. Manjunath, 9788131709122 Pearson Education India, 2007

Engineering Mathematics - II

(EAS-203)

L	T
3	1

Unit - 1: Differential Equations

Linear differential equations of n^{th} order with constant coefficients, Complementary function and Particular integral, Simultaneous linear differential equations, Solution of second order differential equations by changing dependent & independent variables, Normal form, Method of variation of parameters, Applications to engineering problems (without derivation).

Unit - 2: Series Solution and Special Functions

Series solution of second order ordinary differential equations with variable coefficient (Frobenius method), Bessel and Legendre equations and their series solutions, Properties of Bessel function and Legendre polynomials.

Unit - 3: Laplace Transform

Laplace transform, Existence theorem, Laplace transforms of derivatives and integrals, Initial and final value theorems, Unit step function, Dirac- delta function, Laplace transform of periodic function, Inverse Laplace transform, Convolution theorem, Application to solve simple linear and simultaneous differential equations.

Unit - 4: Fourier Series and Partial Differential Equations

Periodic functions, Fourier series of period 2π , Euler's Formulae, Functions having arbitrary periods, Change of interval, Even and odd functions, Half range sine and cosine series, Harmonic analysis. Solution of first order partial differential equations by Lagrange's method, Solution of second order linear partial differential equations with constant coefficients.

Unit - 5: Applications of Partial Differential Equations

Classification of second order partial differential equations, Method of separation of variables for solving partial differential equations, Solution of one and two dimensional wave and heat conduction equations, Laplace equation in two dimension, Equation of transmission lines.

Text Books:

1. B. V. Ramana, Higher Engineering Mathematics, Tata Mc Graw- Hill Publishing Company Ltd.
2. R.K.Jain & S.R.K. Iyenger, Advance Engineering Mathematics, Narosa Publishing House.
3. Babu Ram, Engineering Mathematics, Vol.- II, Pearson Education.

Reference Books:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers.
2. E. Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons.
3. Peter V. O' Neil, Advanced Engineering Mathematics, Thomas (Cengage) Learning.
4. Chandrika Prasad, Advanced Mathematics for Engineers, Prasad Mudranalaya
5. A. C. Srivastava & P. K. Srivastava, Engineering Mathematics, Vol. – II, PHI Learning Pvt. Ltd.
6. Rukmangadachari, Engineering Mathematics – II, Pearson Education.

ENGINEERING PHYSICS- II

EAS-202

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Unit - I 07 Hrs

Crystal Structures and X-ray Diffraction:

Space lattice, basis, Unit cell, Lattice parameter, Seven crystal systems and Fourteen Bravais lattices, Crystal-System Structure, Packing factor (cubic, body and face), Crystal structure of NaCl and diamond, Lattice planes and Miller Indices, Reciprocal Lattice, Diffraction of X-rays by crystal, Laue's experiment, Bragg's Law, Bragg's spectrometer.

Unit - II 08 Hrs

Dielectric and Magnetic Properties of Materials:

Dielectric Properties: Dielectric constant and Polarization of dielectric materials, Types of Polarization (Polarizability). Equation of internal fields in liquid and solid (One- Dimensional), Claussius Mussoiti-Equation, Frequency dependence of dielectric constant, Dielectric Losses, Important applications of dielectric material,

Magnetic Properties: Magnetization, Origin of magnetic moment, Dia, para and ferro magnetism, Langevin's theory for diamagnetic material, Phenomena of hysteresis and its applications.

Unit - III 06 Hrs.

Electromagnetic Theory Displacement Current, Equation of continuity, Maxwell's Equations (Integral and Differential Forms), Poynting theorem and Poynting vectors, EM - Wave equation and its propagation characteristics in free space, non-conducting and in conducting media, Skin depth.

Unit - IV 09 Hrs

Physics of some Technologically important Materials

Semiconductors: Band Theory of Solids, free carrier density(electrons and holes), conductivity of semiconductors, Position of Fermi level in intrinsic and in extrinsic semiconductors.

Superconductors: Temperature dependence of resistivity in superconducting materials, Effect of magnetic field (Meissner effect), Temperature dependence of critical field, Type I and Type II superconductors, BCS theory (Qualitative), High temperature superconductors and Applications of Super-conductors.

Nano-Materials: Basic principle of nanoscience and technology, structure, properties and uses of Fullerene and Carbon nanotubes, Applications of nanotechnology.

Reference books:

1. Concept of Modern Physics - by Beiser (Tata Mc-Graw Hill)
2. Solid State Physics - by C. Kittel, 7th edition (Wiley Eastern)
3. Materials Science and Engineering - by V. Raghavan (Prentice- Hall India)
4. Solid State Physics - by S.O. Pillai, 5th edition (New Age International)
5. Introduction to Electrodynamics - by David J. Griffith (PH I)
6. Applied Physics for Engineers- Neeraj Mehta (PHI Learning, New Delhi)

Engineering Chemistry Lab
EAS 152/EAS252

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LIST OF EXPERIMENTS

Any ten of the following

1. Determination of iron content in the given water sample of Mohr's salt .
2. Determination of alkalinity in the given water sample .
3. Determination of temporary and permanent hardness in water sample using EDTA as standard solution .
4. Determination of available chlorine in bleaching powder .
5. PH- metric titration .
6. Viscosity of an addition polymer like polyester by viscometer .
7. Determination of iron concentration in sample of water by calorimetric method. The method involves the use of KCNS as a colour developing agent and the measurements are carried out at λ_{\max} 480nm .
8. Element detection and functional group identification in organic compounds .
9. Preparation of Bakelite and Urea formaldehyde resin .
10. Determination of Biological oxygen demand of sewage/waste water .
11. Determination of moisture, volatile matter and ash in coal sample (Proximate analysis) .
12. Determination of chemical oxygen demand .

ENGINEERING MECHANICS LAB
EME-152/252

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(Any 10 experiments of the following or such experiments suitably designed)

1. To conduct the tensile test and determine the ultimate tensile strength, percentage elongation for a steel specimen.
2. To determine the compression test and determine the ultimate compressive strength for a specimen
3. To conduct the Impact-tests (Izod / Charpy) on Impact-testing machine to find the toughness.
4. To determine the hardness of the given specimen using Vicker/Brinell/Rockwell hardness testing machine..
5. To study the slider-crank mechanism etc. of 2-stroke & 4-stroke I.C. Engine models.
6. Friction experiment(s) on inclined plane and/or on screw-jack.
7. Simple & compound gear-train experiment.
8. Worm & worm-wheel experiment for load lifting.
9. Belt-Pulley experiment.
10. Bending of simply-supported and cantilever beams for theoretical & experimental deflection.
11. Torsion of rod/wire experiment.
12. Experiment on Trusses.
13. Statics experiment on equilibrium
14. Dynamics experiment on momentum conservation
15. Dynamics experiment on collision for determining coefficient of restitution.
16. Experiment on Moment of Inertia.

Electrical Engineering Lab
EEE151/251

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List of Experiments

Note : A minimum of 10 experiments from the following should be performed

1. Verification of Kirchhoff's laws
2. Verification of (i) Superposition theorem (ii) Thevenin's Theorem (iii) Maximum Power Transfer Theorem.
3. Measurement of power and power factor in a single phase ac series inductive circuit and study improvement of power factor using capacitor
4. Study of phenomenon of resonance in RLC series circuit and obtain resonant frequency.
5. Measurement of power in 3- phase circuit by two wattmeter method and determination of its power factor.
6. Determination of parameters of ac single phase series RLC circuit
7. Determination of (i) Voltage ratio (ii) polarity and (iii) efficiency by load test of a single phase transformer
8. To study speed control of dc shunt motor using (i) armature voltage control (ii) field flux control.
9. Determination of efficiency of a dc shunt motor by load test.
10. To study running and speed reversal of a three phase induction motor and record speed in both directions.
11. To measure energy by a single phase energy meter and determine error.
12. To study P-N diode characteristics
13. To study full wave and half wave rectifier circuits with and without capacitor and determine ripple factors.
14. To study various logic gates (TTL)
15. To study Operational Amplifier as Adder and Subtractor
16. To study transistor as a switch.

WORKSHOP PRACTICE
EWS-151/251

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1. Carpentry Shop:

1. Study of tools & operations and carpentry joints. 2. Simple exercise using jack plane. 3. To prepare half-lap corner joint, mortise & tennon joints. 4. Simple exercise on woodworking lathe.

2. Fitting Bench Working Shop:

1. Study of tools & operations 2. Simple exercises involving fitting work.
3. Make perfect male-female joint. 4. Simple exercises involving drilling/tapping/dieing.

3. Black Smithy Shop:

1. Study of tools & operations 2. Simple exercises base on black smithy operations such as upsetting, drawing down, punching, bending, fullering & swaging.

4. Welding Shop:

1. Study of tools & operations of Gas welding & Arc welding 2. Simple butt and Lap welded joints. 3. Oxy-acetylene flame cutting.

5. Sheet-metal Shop:

1. Study of tools & operations. 2. Making Funnel complete with 'soldering'.
3. Fabrication of tool-box, tray, electric panel box etc.

6. Machine Shop:

1. Study of machine tools and operations. 2. Plane turning. 3. Step turning 4. Taper turning. 5. Threading 6. Single point cutting tool grinding.

7. Foundry Shop:

1. Study of tools & operations 2. Pattern making. 3. Mould making with the use of a core 4. Casing

Computer Aided Engineering Graphics

ECE151/251

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Introduction Drawing instruments and their uses, BIS conventions, Lettering, Dimensioning line conventions and free hand practicing, types of lines.

1- Sheet

Orthographic Projections

Introduction, Definitions – Planes of projection, reference line and conventions employed. Projections of points in all the four quadrants, Projections of straight lines (located in First quadrant/first angle only), True and apparent lengths, True and apparent inclinations to reference planes

2- Sheets

Orthographic Projections of Plane Surfaces

Introduction, Definitions-projections of plane surfaces-triangle, square, rectangle, rhombus, pentagon, hexagon and circle, planes in different positions by change of position method only.

1- Sheet

Projections of Solids

Introduction, Definitions-projections of right regular tetrahedron, hexahedron (cube), prisms, pyramids, cylinders and cones in different positions.

2- Sheets

Sections And Development of Lateral Surfaces of Solids

Introduction, Section planes, Sections, Section views, Sectional views, Apparent shapes and True shapes of Sections of right regular prisms, pyramids, cylinders, and cones resting with base on HP

2- Sheets

Isometric Projection

Introduction, Isometric scale, isometric projection of simple plane figures, Isometric projection of tetrahedron, hexahedron, right regular prisms, pyramids, cylinders, cones, spheres, cut spheres.

2- Sheets

Auto CAD, layout of the software, standard tool bar/menus and description of most commonly used tool bars, navigational tools. Co-ordinate system and reference planes. Definitions of HP, VP, RPP & LPP Creation of 2D/3D environment. Selection of drawing size and scale. Commands and creation of Lines, Co-ordinate points, axes, poly-lines, square, rectangle, polygons, splines, circles, ellipse, text, move, copy, off-set, mirror, rotate, trim, extend, break, chamfer, fillet, curves, constraints.

1-Sheet

Text Books

1. Engineering Drawing – N.D. Bhati & V.M. Panchai, 50th edition, 2012 Charotar Publishing House, Gujarat.
2. Engineering Graphics using AUTO CAD – T Jeyapooran – Vikas Publishing House Pvt. Ltd. New Delhi 110 002
3. A Text book of Engineering Drawng – R.K. Dhawan. S. Chand & Company Ltd. New Delhi – 110055
4. Engineering Graphics using AUTO CAD Venu Gopal – New Age Publications.

PHYSICS LAB
EAS-151/EAS-251

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List of Experiments

Any ten experiments, at least four from each group.

Group -A

1. To determine the wavelength of monochromatic light by Newton's ring.
2. To determine the wavelength of monochromatic light with the help of Fresnel's biprism.
3. To determine the focal length of two lenses by nodal slide and locate the position of cardinal points.
4. To determine the specific rotation of cane sugar solution using polarimeter.
5. To determine the wavelength of spectral lines using plane transmission grating.
6. To study the polarization of light by simple reflection using laser.
7. Measurement of Wavelength of a laser (He- Ne) light using single slit diffraction.

Group – B

8. To determine the specific resistance of a given wire using Carey Foster's bridge.
9. To study the variation of magnetic field along the axis of current carrying - Circular coil and then to estimate the radius of the coil.
10. To verify Stefan's Law by electrical method.
11. To calibrate the given ammeter and voltmeter by potentiometer.
12. To study the Hall effect and determine Hall coefficient, carrier density and - mobility of a given semiconductor using Hall effect set up.
13. To determine the energy band gap of a given semiconductor material.
14. To determine E.C.E. of copper using Tangent or Helmholtz galvanometer.
15. To draw hysteresis curve of a given sample of ferromagnetic material and from - this to determine magnetic susceptibility and permeability of the given specimen.
16. To determine the ballistic constant of a ballistic galvanometer.
17. To determine the coefficient of viscosity of a liquid.
18. Measurement of fiber attenuation and aperture of fiber.
19. High resistance by leakage method.
20. Magnetic Susceptibility of paramagnetic solution.

:PROFESSIONAL COMMUNICATION LABORATORY PRACTICALS
EAS-154/EAS-254

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Interactive and Communicative Practical with emphasis on Oral Presentation/Spoken Communication based on International Phonetic Alphabets (I.P.A.)

LIST OF PRACTICALS

1. Group Discussion: Practical based on Accurate and Current Grammatical Patterns.
2. Conversational Skills for Interviews under suitable Professional Communication Lab conditions with emphasis on Kinesics.
3. Communication Skills for Seminars/Conferences/Workshops with emphasis on Paralinguistics/Kinesics.
4. Presentation Skills for Technical Paper/Project Reports/ Professional Reports based on proper Stress and Intonation Mechanics.
5. Official/Public Speaking based on suitable Rhythmic Patterns.
6. Theme- Presentation/ Key-Note Presentation based on correct argumentation methodologies.
7. Individual Speech Delivery/Conferencing with skills to defend Interjections/Quizzes.
8. Argumentative Skills/Role Play Presentation with Stress and Intonation.
9. Comprehension Skills based on Reading and Listening Practicals on a model Audio-Visual Usage.

Reference Books

1. Bansal R.K. & Harrison: A manual of Speech & Phonetics, Orient Black Swan Pvt. Ltd.
New Delhi, 2010.
2. Sethi & Dhamija: A Course in Phonetics and Spoken English, Prentice Hall, New Delhi, 2011.
3. L.U.B.Pandey: A Manual of Practical Communication, A.I.T.B.S. Pub. India Ltd. Krishan Nagar, Delhi, 2013.
4. Joans Daniel, English Pronouncing Dictionary, Cambridge Univ. Press. 2007.

Computer Programming Lab

NCS-151/NCS-252

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Section A

Any FOUR of the following

1. WAP that accepts the marks of 5 subjects and finds the sum and percentage marks obtained by the student.
2. WAP that calculates the Simple Interest and Compound Interest. The Principal , Amount, Rate of Interest and Time are entered through the keyboard.
3. WAP to calculate the area and circumference of a circle.
4. WAP that accepts the temperature in Centigrade and converts into Fahrenheit using the formula $C/5=(F-32)/9$.
5. WAP that swaps values of two variables using a third variable.
6. WAP that checks whether the two numbers entered by the user are equal or not.
7. WAP to find the greatest of three numbers.
8. WAP that finds whether a given number is even or odd.
9. WAP that tells whether a given year is a leap year or not.
10. WAP that accepts marks of five subjects and finds percentage and prints grades according to the following criteria:
Between 90-100%-----Print 'A'
80-90%-----Print 'B'
60-80%-----Print 'C'
Below 60%-----Print 'D'

Section B

Any FOUR of the following

11. WAP that takes two operands and one operator from the user and perform the operation and prints the result by using Switch statement.
12. WAP to print the sum of all numbers up to a given number.
13. WAP to find the factorial of a given number.
14. WAP to print sum of even and odd numbers from 1 to N numbers.
15. WAP to print the Fibonacci series.
16. WAP to check whether the entered number is prime or not.
17. WAP to find the sum of digits of the entered number.
18. WAP to find the reverse of a number.
19. WAP to print Armstrong numbers from 1 to 100.

Section C

Any FOUR of the following

20. WAP to convert binary number into decimal number and vice versa.
21. WAP that simply takes elements of the array from the user and finds the sum of these elements.
22. WAP that inputs two arrays and saves sum of corresponding elements of these arrays in a third array and prints them.
23. WAP to find the minimum and maximum element of the array.
24. WAP to search an element in a array using Linear Search.
25. WAP to sort the elements of the array in ascending order using Bubble Sort technique.
26. WAP to add and multiply two matrices of order nxn.
27. WAP that finds the sum of diagonal elements of a mxn matrix.
28. WAP to implement strlen (),strcat (), strcpy () using the concept of functions