

FIRST YEAR B. TECH. (Common for all branches)
(Applicable to students admitted during 2014 and later)

Physics Group

Year	First Semester						Second Semester					
	Subject Code	L	T	P	C	Subject Code	L	T	P	C	Total	
1	MAT 1101	3	1	0	4	MAT 1201	3	1	0	4	Total 13 6 9 22	
	PHY 1001	2	1	0	3	Engineering Mathematics - II	2	1	0	3		
	CIE 1001	2	1	0	3	Engineering Chemistry	2	1	0	3		
	ECE 1001	2	1	0	3	Biology for Engineers	2	1	0	3		
	MME 1001	2	1	0	3	Basic Electrical Technology	2	1	0	3		
	HUM 1001	2	1	0	3	Problem Solving Using Computers	2	1	0	3		
	PHY 1011	2	1	0	3	Environmental Studies	2	1	0	3		
	MME 1011	0	0	3	1	Engineering Chemistry Lab	0	0	3	1		
	MME 1111	0	0	3	1	PSUC Lab	0	0	3	1		
		0	0	3	1	Engineering Graphics - I	0	0	3	1		

Chemistry Group

Year	First Semester						Second Semester					
	Subject Code	L	T	P	C	Subject Code	L	T	P	C	Total	
1	MAT 1101	3	1	0	4	MAT 1201	3	1	0	4	Total 14 5 9 22	
	CHM 1001	2	1	0	3	Engineering Mathematics - I	2	1	0	3		
	BIO 1001	2	1	0	3	Engineering Chemistry	2	1	0	3		
	ELE 1001	2	1	0	3	Biology for Engineers	2	1	0	3		
	CSE 1001	2	1	0	3	Basic Electrical Technology	2	1	0	3		
	CIE 1002	3	0	0	3	Problem Solving Using Computers	2	1	0	3		
	CHM 1011	0	0	3	1	Environmental Studies	2	1	0	3		
	CSE 1011	0	0	3	1	Engineering Chemistry Lab	0	0	3	1		
	MME 1111	0	0	3	1	PSUC Lab	0	0	3	1		
		0	0	3	1	Engineering Graphics - I	0	0	3	1		

MAT 1101: ENGINEERING MATHEMATICS - I [3 1 0 4]**Matrix Algebra**

Matrices, column and row transformations, Inverse of a matrix, Echelon form and rank of a matrix, System of linear equations: Consistency, Solution by Gauss elimination, Gauss Jordan, Gauss Jacobi and Gauss Seidel methods, Solution of tri-diagonal systems, Eigen values and Eigen vectors: Elementary properties, Computation of largest Eigen value by power method.

Linear Algebra

Vector concept to higher dimensions, generalized vector operations, Vector spaces and sub spaces, Linear independence, Linear transformations.

Inner products, Inner product spaces, Orthogonal projections, Gram-Schmidt process of orthogonalization.

Differential equations and applications

First order differential equations and applications. Review of solution of first order differential equations. Higher order differential equations: Solution of homogeneous and nonhomogeneous linear equations. Cauchy and Legendre's differential equations; Solution of system of differential equations

Numerical Methods

Interpolation: Finite differences and divided differences. Newton-Gregory and Lagrange's interpolation formulae; Newton's divided difference interpolation formula; Numerical differentiation; Numerical integration: Trapezoidal rule, Simpson's one third rule and Simpson's three eighth rule.

Solution of Algebraic and Transcendental equations: Bisection method, Method of false position, Iteration method, Newton-Raphson method. Solution of System of Non-linear equations using Newton-Raphson method

Numerical solution of ordinary differential equations: Taylor's series method, Euler's method, Modified Euler's method, Runge-Kutta methods and Predictor corrector methods.

References:

1. B. S. Grewal, "Higher Engineering Mathematics", (42e), Khanna Publishers, 2013
2. Kreyzig E., "Advanced Engineering Mathematics", (10e), Wiley Eastern, 2011
3. David C. Lay, "Linear Algebra and applications", (3e), Pearson Education, 2009
4. Sastry S. S., "Introductory methods of Numerical analysis", (4e), PHI, 2007
5. Rainville E. D. and Bedient P. E., "A short course in differential equations", (4e), Macmillan Publishers, 1969

Partial Differentiation:

Definition, Euler's theorem on homogeneous functions; Total derivative; Derivatives of composite & implicit functions; Errors and approximations Taylor's theorem for functions of two variables; Maxima and Minima; Lagrange's method of undetermined multipliers

Mean Value Theorems and Indeterminate Forms:

Cauchy's mean value theorem, Taylor's mean value theorem. Taylor's and Maclaurin's expansion of functions; indeterminate forms

Infinite Series:

Definitions, convergence and divergence of an infinite series; Tests: comparison test, ratio test, Cauchy's root test, Raabe's test, Integral test. Alternating series: Leibnitz's theorem, absolute and conditional convergence; Power series

Analytical solid geometry:

Spheres, Right circular cylinders and Right circular cones

Multiple Integrals:

Double and Triple integrals, Evaluation by the change of order of integration, change of variables, Jacobians. Applications to surface area and volumes; Beta and Gamma functions

Laplace transforms:

Transforms of elementary functions, Shifting theorems, Transforms of periodic functions, Unit step function, Transforms of derivatives. Inverse transforms. Solution of differential equations using Laplace transforms.

References:

1. B. S. Grewal, "Higher Engineering Mathematics", (42e), Khanna Publishers, 2013
2. N. Piskunov, "Differential Calculus", Vol I and II, Mir Publications, Moscow, 1981
3. Rainville E. D. and Bedient P. E., "A short course in differential equations", (4e), Macmillan Publishers, 1969
4. Kreyzig E., "Advanced Engineering Mathematics", (10e), Wiley Eastern, Delhi, 2011
5. Shanti Narayan, "Differential Calculus", (30e), S Chand & Co Ltd, 2005

PHY 1001: Engineering Physics [2 1 0 3]

Optics: Two source interference, Double slit interference, Coherence, Intensity in double slit interference using phasor method, Interference from thin films, Newton's rings, Diffraction and wave theory of light, Single-slit diffraction, Intensity in single-slit diffraction using phasor method, Diffraction at a circular aperture, Double-slit interference and diffraction combined- Intensity in double-slit diffraction (Qualitative approach), qualitative description of multiple slits and diffraction grating

Applied Optics: Spontaneous and stimulated transitions, He-Ne and Ruby laser, Applications of lasers, Optical fiber, Total internal reflection, angle of acceptance and numerical aperture, types of optical fiber, types of attenuation, applications of optical fibers.

Quantum Physics: Black body radiation and Planck's hypothesis, Stefan's Law, Wein's displacement law, Photoelectric effect, Compton effect, Photons and electromagnetic waves, Wave properties of particles, de-Broglie hypothesis, Quantum particle (wave packet, phase speed, group speed). The double-slit experiment revisited, the uncertainty principle

Quantum Mechanics: An interpretation of quantum mechanics, Wave function and its significance, particle in a box (infinite potential well), Schrodinger equation, Particle in a well of finite height, Tunneling through a potential barrier and its applications, The quantum model of the hydrogen atom, The wave functions for hydrogen

Solid State Physics: Free electron theory of metals, Band theory of solids, Electrical conduction in metals, Insulators and Semiconductors, Superconductivity-Properties and Applications

References:

1. Halliday, Resnick, Krane; "PHYSICS: Volume 2", (5e), John Wiley & Sons, Inc, 2009
2. Serway & Jewett; "PHYSICS for Scientists and Engineers with Modern Physics", (9e), Thomson, 2013

CHM 1001: ENGINEERING CHEMISTRY [2 1 0 3]

Electrochemistry: Galvanic cell and Electrolytic Cells, Nernst equation, Energetics of Cell Reactions, Determination of E.M.F., Standard Cell, Weston Cadmium Cell, Calomel Electrode, Glass Electrode, Concentration Cells

Battery Technology: Battery Characteristics, Primary and Secondary Batteries, Dry cell, Lithium copper sulfide cell, Lead-acid, Nickel-cadmium and Lithium ion batteries, Fuel cells, Alkaline fuel cell, Proton exchange membrane fuel cell and Direct methanol fuel cell

Corrosion and its Control: Classification, Electrochemical theory of corrosion, Galvanic series, Galvanic, pitting, stress and intergranular corrosion, Factors affecting corrosion, Corrosion prevention methods

Metal Finishing: Polarization, Decomposition potential and overvoltage; Characteristics of a good deposit, Factors influencing the nature of deposit, Methods of cleaning the metal surface, Hard chromium and decorative chromium plating, Electroless plating, Electroless plating of copper

Chemical Fuels: Classification, Calorific value and its determination Bomb calorimeter and Boys calorimeter, Coal and its analysis -proximate and ultimate, Brief account of liquid and gaseous fuels

Modern Materials: Fundamental Principles, Different types of chemical bonds, Chemistry and applications of Polymers, Biomaterials, Glass, Cement, Ceramics, Composite materials, Liquid crystals, Superconducting materials, Thin films, Nanomaterials

References:

1. P. C. Jain, M. Jain, "Engineering Chemistry", (15e), Dhanpat Rai & Sons, Delhi, 2006
2. C. V. Agarwal, "Chemistry of Engineering Materials", (9e), BS Publications, Delhi, 2006

BIO 1001: BIOLOGY FOR ENGINEERS [2 1 0 3]

Chemistry of life: Elements of life and their bonding ability; Introduction to biomolecules: water, phospholipid, Energy storage molecule, carbohydrates, Proteins and their structure, Enzymes, bioenergetics, effect of pH on Biological system, structure of DNA & RNA

Inheritance in life: Principles of biology; Biological Hierarchies; Introduction to genetic terms using examples of evolution; Introduction to Mendelian Genetics- Experiments and terms; Monohybrid, Dihybrid, Test cross, chromosomes, genetic diseases

Molecular basis of inheritance: Transformation experiments; DNA-the hereditary material; DNA replication; problems in replication; RNA, transcription, template, non-template, coding and non-coding, Translation- genetic code, start and stop.

Biological Diversity and evolution: Principles of biology, Biological Hierarchies, Modularity and incremental change, Form and function, Symbiosis, coevolution, communal benefit, commensalism, parasitism; Biological control systems, Bioinspiration and biomimetics

Case studies: Nature's number, origin of life, evolution of hemoglobin, sickle cell anemia, bio nano machine, Photosynthesis, circulation and gas exchange in Biological system, vaccination, Green revolution: disease resistant plants, Epigenetics: Examples from Human Population biotechnology, Seeking clues in DNA, Antibiotic Resistance

References:

1. Arthur T Johnson, "Biology for Engineers", CRC Press, 2010
2. J.B. Reece, L.A. Urry, M.L. Cain, S.A. Wasserman, P.V. Minorsky, R.B. Jackson, Benjamin Cummings, "Campbell-Biology", (9e), Pearson Global, 2011
3. David L Nelson & Michael M Cox, "Lehninger - Principles of Biochemistry", (5e), W.H. Freeman and Company, New York, 2008
4. Alberts, Johnson, Lewis, Raff, Robert, Walter, "Molecular Biology of the Cell", (5e), Garland Science Publisher, 2008

CIE 1002: ENVIRONMENTAL STUDIES [3 0 0 3]

Introduction of the subject: Significance and need, Applications of environmental science/engineering in various engineering disciplines, environmental ethics, concept of sustainable development

Ecosystem: Meaning, structure and functions, food chain, and food web, ecological pyramids, energy flow in an ecosystem, types of ecosystems.

Biodiversity and its conservation: Meaning, factors affecting diversity, threats and conservation strategies

Natural Resources: Renewable and non-renewable energy sources

Environmental Pollution: Causes, effects, remedies for water, air, solid waste (land), noise, biomedical, nuclear, marine, nuclear, e-wastes & overview of water supply and sanitation

Global environmental issues: Rain water harvesting, watershed management, global warming, acid rain, ozone layer depletion- causes, effects and remedies, green buildings, Interlinking of rivers

Disaster Management: Meaning, episodes/case studies, Application of GIS, role of IT.

Environmental legislations: Salient features of water, air, soil and environmental protection acts.

Term work: A field visit to a local polluted site, study of an ecosystem, audio-visual display of current environmental issues.

References:

1. Benny Joseph, "Environmental studies", McGraw-Hill Education (India), 2009
2. R. Rajagopalan, "Environmental studies: From Crisis to Cure", (2e), Oxford Higher Education, 2011
3. P. Venugopal Rao, "Principles of Environmental Science and Engineering", PHI, 2006
4. Erach Bharucha, "Text book of Environmental Studies for undergraduate courses", Universities Press, Hyderabad, 2010
5. Gupta Harsh K, "Disaster Management", Orient Blackswan, 2003

HUM 1001: COMMUNICATION SKILLS IN ENGLISH [2 1 0 3]

Oral communication: Speech- presentation /Impromptu speeches, group discussion, interview techniques, formal / informal communication

Listening Audio: Texts/speeches (Test listening skills factual, evaluative questions and summary

Reading: Extracts from texts different genres/ styles

Writing: Creative writing assignment, academic writing, formal writing essay, paragraphs, business correspondence, mechanics of writing punctuation, functional grammar, editing (given text- extract)

References:

1. Strunk, W and White E. B., "The Elements of Style", Longman, New York, 1999
2. Sorby, S. A. and Bulleit W, "An Engineer's Guide to Technical Communication", Longman, New York, 2006
3. Raman, Meenakshi and Sharma, S., "Technical Communication: Principles and Practice", Oxford University Press, India, 2011
4. Jones, D., "Cambridge English Pronouncing Dictionary", Cambridge University Press, 2011

CIE 1001: MECHANICS OF SOLIDS [2 1 0 3]

Part-A: Mechanics of Rigid bodies

Resultant of coplanar concurrent and non-concurrent force system: Resolution, composition, moment of force, Varignons theorem, couple, application problems

Equilibrium of Coplanar concurrent and noncurrent force system: Conditions of equilibrium, Space and free body diagram, Lami's theorem - application problems

Support reaction, types of loading, friction - application problems.

Centroid and Moment of Inertia: Simple and composite areas, application problems

Part-B: Mechanics of Deformable bodies

Simple Stresses and Strains: Mechanical properties of materials,

Hooke's law, modulus of elasticity, tension test on ductile and brittle materials, factor of safety, allowable stress, Stresses and deformations in tapering bars, stepped bars, Poisson's ratio, shear stress and shear strain, modulus of rigidity, relation between modulus of elasticity, modulus of rigidity and bulk modulus., application problems.

Statically indeterminate members - Compound bars, thermal stress

Stresses in thin cylinder: hoop, longitudinal and shear stresses; Change in dimensions due to the fluid pressure, joint efficiency and application problems

Shear force and bending moment diagrams: SFD and BMD for statically determinate beams

References:

1. Singer F.L., "Engineering Mechanics", Harper & Row, 1994
2. Bhavikatti & Rajasekharappa, "Engineering Mechanics", New Age International, 2006
3. Pytel and Singer, "Strength of Materials", Harper & Collins, 1987
4. Bhavikatti S.S., "Strength of Materials", Vikas Publishers, 2005
5. Basavarajaiah & Mahadevappa, "Strength of Materials", CBS Publishers, 2001

ECE 1001: BASIC ELECTRONICS [3 0 0 3]

Analog Electronics: Diode and its application: I-V Characteristic, Static and dynamic Resistance, Half and Full Wave Rectifiers with and without filter, Zener regulator, 78xx regulator, Special purpose diodes. BJT and its applications: I-V Characteristics, Cut-off, active and saturation mode of operation, CB, CC and CE configuration, Transistor Biasing: fixed, voltage divider bias and emitter bias. Transistor as an amplifier: RC coupled Amplifier; Transistor as a Switch: Relay Driver Circuit. Operational Amplifier and its applications: Basic model, virtual ground concept, inverting amplifier, non-Inverting Amplifier, adder, subtractor, difference amplifier, integrator, differentiator, comparator, Square wave generator.

Digital Electronics: Number systems and Codes, Boolean Algebra; Logic gates: OR, NOT, AND, NOR, NAND, XOR and XNOR. Concept of Universal Logic; Simplification of Boolean functions using K map; Flip-flops: JK flip flop and D-flip flop and simple applications. Introduction to ADC&DAC

Principles of Electronic Communication: Fundamentals of Analog communication, Introduction to Digital Communication, Communication networks, Mobile Communication.

References:

1. Albert P Malvino, "David J Bates Electronic Principles", 7e, TMH, 2007
2. George Kennedy, Bernad Davis, "Electronic Communication Systems", 4e, TMH, 2004
3. Robert L. Boylestad, Louis Nashelsky, "Electronic Devices & Circuit Theory", 11e, PHI, 2012
4. Malvino and Leach, "Digital Principles & applications", 7e, TMH, 2010

ELE 1001: BASIC ELECTRICAL TECHNOLOGY [2 1 0 3]

Electric Circuit Elements: Active and passive elements, Source transformation, Resistors in series, Resistors in parallel, Capacitors in series and parallel, Inductor in series and parallel, Transient analysis and energy stored in inductor and capacitor.

DC circuit Analysis: Star- delta transformations, Mesh current method, Node voltage method.

Electromagnetism: Magnetic field due to electric current, Faraday's laws of Electromagnetic induction, self and mutual inductance, dot rule.

Magnetic Circuits: MMF, magnetic field strength, permeability, reluctance, series and parallel magnetic circuits.

Single-phase AC Circuits: Average value and rms value of periodic sinusoidal and non- sinusoidal wave forms, form factor, Phasor representation. Alternating current in pure resistor, inductor and capacitor, RL, RC, and RLC series circuits, average power, power factor, parallel AC circuit, analysis of series parallel circuits, complex power and power triangle, improvement of power factor.

Resonance: Series and parallel resonance, Q factor, half- power frequencies, bandwidth

Three-phase AC Circuits: 3- phase system, phase sequence, star and delta connections, relationship between line and phase voltage and current, analysis of 3-phase circuit with balanced and unbalanced loads, three phase power measurement by two wattmeter method.

Electrical Power System: Power system components, Overview of Electrical Machines, Energy measurements.

References:

1. Kothari D. P. & Nagarith I. J., "Basic Electrical Technology", (2e), TMH, 2009
2. Nagasarkar T. K. & Sukhija M. S., "Basic Electrical Engineering", (2e), OUP, 2011
3. Hughes E., "Electrical and Electronic Technology", (10e), Pearson Education, 2010

MME 1001: BASIC MECHANICAL ENGINEERING [2 1 0 3]

Properties of Steam and Boilers: Steam formation, Types of steam, Steam properties- Enthalpy, Simple numericals for finding enthalpy and dryness fraction. Steam Boilers: Classification, Working principle of Babcock & Wilcox Boiler.

Prime Movers: Classification of Prime movers, Working principle of steam, gas and water turbines, Concept of impulse and reaction steam turbines.

Power plants: Working principle of thermal, nuclear, hydel and solar power plants (Illustration with block diagram only)

Refrigeration: Principle and working of vapour compression refrigeration system, Desirable properties of an ideal refrigerant, Definition of COP, Unit of refrigeration

I.C. Engines: Classification, Working of 2-stroke, 4 - stroke C.I and S.I Engines with P-V diagrams, Definitions and simple numerical for determining Indicated Power, Brake Power, Mechanical efficiency, Indicated thermal

efficiency, and Brake thermal efficiency, Working of simple carburetor, Types and properties of lubricants, Splash lubrication system.

Power Transmission: Definition, Belt drives- open and crossed, Velocity ratio, Stepped cone pulley, Fast and loose pulley, Length of belt, Tension in the belt, Slip, Creep (No derivations), Introduction to rope drive and chain drives, Gear Drives-Types of gears, Velocity ratio for Gear trains, Simple and compound gear trains, Numericals on belt and gear drives.

Machine Tools: Lathe - Classification, Block diagram of engine lathe, Specification of lathe, List of lathe operations. **Drilling -** Classification of drilling machines, Block diagram of radial drilling machine, List of drilling operations.

Casting and Forging: Types of moulding sand and its desirable properties, Patterns- Single piece and split piece pattern, Pattern allowances, Steps in the preparation of two box green sand mould, Defects in casting, Introduction to forging.

Welding: Classification, Principle of Resistance spot welding, Electric arc welding and oxy-acetylene gas welding, Gas flames, Introduction to soldering and brazing

Introduction to Engineering Materials: Ferrous and Non-ferrous metals and its properties, Introduction to heat treatment.

References:

1. K. R.Gopalakrishna, "Text book of elements of Mechanical Engineering", Subhash Publications, Bangalore, 2005.
2. Roy & Choudhury, "Elements of Mechanical Engineering", Media Promoters & Publishers Pvt. Ltd, Mumbai, 2000.
3. Mishra B.K., "Mechanical Engineering Sciences", Kumar & Kumar Publishers (P) Ltd, Bangalore, 1999.
4. Trymbaka Murthy S., "A text book of elements of Mechanical Engineering", I. K. International Publishing House Pvt. Ltd, 2010.
5. Rajput R. K., "Elements of Mechanical Engineering", Fire Wall Media, 2005.
6. B. S. Raghuvanshi, "A Course in Workshop Technology", Vol 1, Dhanpat Rai & Sons, New Delhi, 2005.

MME 1111 ENGINEERING GRAPHICS I [0 0 3 1]

Introduction: Geometrical constructions, Dimensioning and conventions of lines

Projection of points: Orthographic projection, reference planes, Quadrants, Types of quadrants, Conventional representation of first angle projection system. Projection of points

Projection of straight lines: Line parallel to both reference planes; Perpendicular to reference plane; Inclined to one reference plane; Inclined to both reference planes including locating traces; finding true length and inclinations.

Projection of plane surfaces: Simple planes (Triangle, Square, Rectangle, Pentagon, Hexagon & Circle), Plane resting on edge and corner conditions, Surface inclined to HP & perpendicular to VP, Surface inclined to VP and perpendicular to HP, Planes inclined to both HP & VP (Change of position method only).

Projection of solids: Simple solids like prisms & pyramids (Triangle, Square, Rectangle, Pentagon & Hexagon), Cone and cylinder, Solids resting on edge and corner conditions, Axis inclined to HP and parallel to VP, Inclined to VP & parallel to HP, axis inclined to both HP and VP (Change of position method only)

References:

1. Gopalkrishna K. R. and Sudhir Gopalkrishna, "A textbook of Computer Aided Engineering Drawing", (37e), Subhas Stores, Bangalore, 2012.
2. Bhat N. D. and V.M. Panchal, "Engineering Drawing", (50e), Charotar Publishing House, Anand, India, 2010
3. Venugopal K. "Engineering Drawing and Graphics + Auto CAD" Newage International Publishers, Delhi, 2002
4. Narayana K. L. and Kanniah P, "Text book on Engineering Drawing" Scitech Publications, Chennai, 2002
5. Basant Agrawal & Agrawal C M, "Engineering Drawing", Tata McGraw Hill, New Delhi, 2010

MME 1211: ENGINEERING GRAPHICS II [0 0 3 1]

Introduction: Sectioning the object, Development of surfaces of solids, Isometric projection, Orthographic projection and its applications

Sections of solids: Horizontal vertical and inclined section planes and true shape of sections; Drawing sectional views with true shape of section. Simple cases of solids resting on HP or VP with axis perpendicular to reference planes, inclined to one reference plane. Section plane perpendicular to VP, inclined to HP and inclined to VP.

Development of surfaces: Parallel line development for prisms (Triangle, Rectangle, Square, Pentagon and Hexagon) and cylinders (Including simple cut solids), Radial line development for pyramids (Triangle, Square, Rectangle, Pentagon and Hexagon) and cones (Including simple cut solids)

Isometric projections and views: Simple & cut solids (Prisms, Pyramids, Cones, Cylinders), combined solids, Simple machine components

Orthographic conversions: Simple & cut solids (Prisms, Pyramids, Cones, Cylinders), combined solids, Simple machine components.

References:

1. Gopalkrishna K. R. and Sudhir Gopalkrishna, "A textbook of Computer Aided Engineering Drawing", (37e), Subhas Stores, Bangalore, 2012
2. Bhat N. D. and V.M. Panchal, "Engineering Drawing", (50e), Charotar Publishing House, Anand, India, 2010
3. Venugopal K., "Engineering Drawing and Graphics + Auto CAD", Newage International Publishers, Delhi, 2002
4. Narayana K. L. and Kanniah P, "Text book on Engineering Drawing", Scitech Publications, Chennai, 2002
5. Basant Agrawal & Agrawal C M, "Engineering Drawing", Tata McGraw Hill, New Delhi, 2010

MME 1011: WORKSHOP PRACTICE [0 0 3 1]

Mechanical Engineering Practices: Sheet Metal work, Plumbing Exercises, Study of Automotive systems like steering mechanism, Transmission System, Suspension, Demonstration of Spur gear, Helical gear, Belt drives, Chain drives, Couplings, Keys, Bearings, Fasteners, Gear box, Engine parts, Demonstration on the working of Lathe and Drilling machine.

Civil Engineering Practices: Tensile test, Shear test and Compression test, measure and plot the given area using chain and tape, prismatic compass, plot the profile of a ground using dumpy-level and levelling staff.

Electrical and Electronics Engineering Practices: Demonstration of wiring tools, types of wires and wiring systems, Wiring rules, Electrical safety and precautions, types of electrical lighting sources. Wiring of lamp controlled by single switch; Staircase wiring; 3-pin plug socket; Familiarization of fuses, MCB, ELCB, Study of overload protection with fuses. Wiring of a single-phase energy meter with AEH Load, Wiring of 3-phase energy meter with lighting load and a 3-phase Induction Motor with DOL starter

Familiarization of electronic components such as Resistors, Capacitors, diodes, transistors, and Integrated Circuits, Multimeter and testing of diodes and transistors, Bread-board assembly, Soldering practice on PCB; assembling simple electronic gadgets such as digital counter, buzzer with a 555 timer, musical doorbell; Building a DC regulated power supply.

References:

1. Hajra Choudhury S. K and Bose S .K, "Elements of Workshop Technology", Volume I, Media Promoters & Publishers Pvt. Ltd., Mumbai, 2012.
2. Raghuvanshi S.S, "Workshop Technology", Dhanpat Rai and Sons, Delhi, 2002.
3. Punmia B.C, "Surveying", Laxmi Publications, Bangalore, 2012
4. Bhattacharya S.K and Rastogi K.M, "Experiments in Basic Electrical Engineering", New Age International, Delhi, 2003
5. Maheshwari L.K and Anand M.M.S, "Laboratory manual for Introductory Electronics", New Age International, Delhi, 2008

CSE-1001: PROBLEM SOLVING USING COMPUTERS [2 1 0 3]

Computer - Hardware and Software; Memory and its types Input / Output Devices; Problem solving using computer: algorithms and Flowcharts; C++ program structure, character set, identifiers and key words, Operators and expressions, Operator precedence and associativity, type conversions, arithmetic expressions, evaluation of expressions; Control Structures - Statements and blocks, looping constructs, Arrays & Strings 1D array, programs on array manipulation, 2-D arrays, matrix manipulation, strings-operation on strings; Coding exercises on various numerical analysis algorithms; Structured Programming Functions; Structures and Pointers; Introduction to object oriented programming - basic concepts, benefits; File Manipulation - File handling functions, Introduction to cyber security.

References:

1. E. Balaguruswamy, "Object Oriented Programming with C++", (6e), Tata McGraw Hill, 2013
2. E. Balaguruswamy, "Computing Concept and Programming in C", Tata McGraw Hill, 2008.
3. Delores M. Etter, "Engineering Problem Solving with C", 2013
4. Grewal B.S., "Numerical Methods in Engineering and Science with Programming in C and C++", Khanna Publishers, 2010
5. Sastry S.S., "Introductory methods of Numerical analysis", (4e), PHI, 2007.

CSE 1011: PROBLEM SOLVING USING COMPUTERS LAB [0 0 3 1]

Programming using C++: Familiarisation of programming environment; simple programs; Programs on Branching Control Structures; Looping Control Structures; 1-D arrays and its manipulation, searching and sorting; 2-D arrays, matrix manipulations; Strings string handling functions; Implementation of numerical methods, User defined functions; Pointers and Structures; File Manipulations

Introduction to MATLAB: Interactive computations, script files, data visualization, functions, file I/O and GUI, Introduction to SIMULINK.

References:

1. Grewal B.S., "Numerical Methods in Engineering and Science with Programming in C and C++", Khanna Publishers, 2010
2. E. Balaguruswamy, "Object Oriented Programming with C++", 6th edition, Tata McGraw Hill, 2013
3. Rudrapratap, "Getting Started with MATLAB - A Quick introduction for scientists and engineers", Oxford University Press 2009.

PHY 1011: ENGINEERING PHYSICS LAB [0 0 3 1]

1. Ultrasonic Interferometer
2. Series and parallel resonances

3. Wavelength of laser using diffraction grating
4. Newton's rings
5. Fermi energy of metals
6. Band gap energy
7. Determination of Boltzmann constant
8. Hall effect
9. Black body radiation
10. Photo electric effect
11. Resistivity of semiconductors using four probe method
12. Numerical aperture of optical fiber

CHM 1011: ENGINEERING CHEMISTRY LABORATORY [0 0 3 1]

1. Alkalimetric titration
2. Total hardness of water
3. Estimation of percentage of copper in brass
4. Estimation of weight of iron in haematite
5. Estimation of percentage of manganese dioxide in pyrolusite
6. Estimation of ammonia nitrogen in a fertilizer
7. pK value of a weak acid by potentiometric titration
8. Conductometric acid-base titration
9. Determination of concentration of copper using Colorimer
10. Determination of coefficient of viscosity of liquid.
11. Chloride content of water
12. Analysis of lead pigment

References:

1. Vogel A.I. "Text book of Quantitative Inorganic Analysis", (5e), ELBS, 1998
2. "Laboratory Manual for Engineering Chemistry Laboratory", M.I.T., 2013

