Group – B

APPLIED MATHS – II(AS – 1006)

Course Code	**AS – 1006**	Credits : 4	L-3, T-1, P-0
Name of the Course	**APPLIED MATHS – II**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

Vector Calculus: Curves, ac length, tangent, curvature and torsion, Direction derivative, Gradient of a scalar field, divergence and curl of a vector field. Line, surface and volume integrals, theorem of gauss, Stoke's and Green's (proofs not needed), consequences and applications.

SECTION – B

Integral Transforms: Fourier series, Euler's formula, even and odd functions, half range expansions. Fourier integral. Fourier and Laplace transform, Inverse transform of derivatives and integrals, shifting theorem, application to periodic functions, unit step function, impulse function.

SECTION – C

Second order Differential Equations: Solution by: Power series method and its basis, Solution of Bessel and Legendre differential equations, properties of Bessel and Legendre functions.

SECTION – D

Partial Differential Equations (PDE): Formulation and classification. Solution of wave equation heat equation in one dimension and Laplace equation in two dimesion by the method of separation of variables.

Books:

1. E.Kreyszig, Advanced Engineering Mathematics (Wiley Eastern Pvt. Ltd.).
2. S.S.Sastri, Engineering Mathematics (2nd edition) Vol-I and Vol-II.
3. B.S.Grewal, Higher Engineering Mathematics.
4. Piskunov, Differential and Integral Calculus.
5. R.K.Jain and S.R.K.Iyengar, Advanced Engineering, Mathematics.
6. Michael d.Greenberg, Advanced Engg. Mathematics.

APPLIED PHYSICS– II(AS – 1007)

Course Code	**AS – 1007**	Credits : 4	L-3, T-1, P-0
Name of the Course	**APPLIED PHYSICS – II**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

Crystal Structure: Space lattice, unit cell and translation vector, miller indices, Simple crystal structure, bonding in solids, Experimental x-ray diffraction method, laue method, powder method.

Free electron theory: Elements of classical free electron theory and its limitatios. Quantum theory of free electrons, Fermi level, density of states, fermi dirac distribution function, Thermionic emission, Richardson's equation.

SECTION – 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 into metals, semiconductors and insulators, fermi energy and its variation with temperature.

SECTION – C

Photoconductivity & Photovoltaic: Photoconductivity in insulating crystals, variation with illumination, Effect of traps, application of photoconductivity, Photovoltaic cell and their characteristics.

Properties of Solids: Atomic Magnetic Moments, Orbital Diamagnetism, Classical Theory of Para magnetism, Ferromagnetism Molecular Field theory and domains, Magnetic circuit. Its comparison with Electric circuit and its applications, Super Conductor (Introduction, Types and Applications) Hall Effect.

SECTION – D

Laser: Spontaneous and stimulated emission, Laser action, Characteristics of Laser Beam – Concept of coherence, Types of lasers based on pumping techniques, He-Ne Laser, Semiconductor Laser (simple Ideas) with applications.

Fiber Optics: Optical communication: Communication through open space, optical wave guides with special reference to Propagation of light in Fibres, Numerical Aperture, single mode and multi mode Fibers, applications.

Books:

1. Charles Kittel: Introduction to Solid State Physics.
2. B.S.Saxena, R.C.Gupta & P.N.Saena: Solid state Physics.
3. M.B.Avadhanulu & P.G.Kshirsagar, A text book of Engineering Physics.
4. Arthur Beiser, concepts of Modern Physics, 5th International edition Tata McGraw Hill.
5. A.J.Dekkar, Introduction to solid state Physics.

CHEMISTRY(AS – 1004)

Course Code	**AS – 1004**	Credits : 4	L-3, T-1, P-0
Name of the Course	**CHEMISTRY**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

Thermodynamics: Second law concept of Entropy, Entropy change for an ideal gas, free energy andwork functions, Free energy change Gibb's Helmholtz equation, Clausius – Clapeyron equation, Related numerical problems with above topics.

Phase Rule: Introduction, One Compondnet Sytem, Two components System (Water, Sulphur and Alloy System), thermal Analysis, auxiliary.

SECTION – B

Water Treatment: Introduction, Sources of water, Impurities , Hardesss Anayliss, Oxidations, (BOD & COD), Boiler Corrosion Sewage & Treatment.

Pollution and Control: Introductions, Types of corrosions, Electrochemical Theory, Pitting, Water Line, Differential Aerations corrosions, Stress Corrosions, Factors affecting Corrosions, Preventive measures.

SECTION – C

Lubricants: Introductions, Fritins and Wear, Lubricants, Mechanism of Lubrications, Base oil, Additives, Greases and Emulsions.

Fuel and Combustion: Introduction, class of fuels (Solid, Liquid and Gases) Cola and its origin, Analysis of Coals, Petroleum fuels, Crude Petroleum and its refining, Cracking, Hydofinishings and Diesel, Kerosene, Gesoline as fuels. Gases fuels, Water Gas, Gio-Gas, nuclear Fuel, Breeder Reactors.

SECTION – D

Solid State Chemistry: Introduction, Lattices and Periodicity, Elements of Band Theory, Conductors, Insulators and Semi-Conductors, Structure Determination by I.R.NMR, X-Ray UV, Mass Spectroscopy.

Catalysis: Introduction, criteria of Catalysts, Types of Catalyst, Enzyme Catalysis, Mechanism of Catalysis (Homogeneous & Heterogeneous Catalysis).

Books:

1. Engineering Chemistry: By P.C.Jain & Monika Jain, Dhanpat Rai and Sons.
2. A Text Book of Engineering Chemistry: Bu Shastri Chawla, Dhanpat Rai & Sons.
3. Physical Chemistry: By R.P.Verma, Pardeep Publishers Jallandhar.
4. Principles of Physical Chemistry: By Puri, Sharma, Pathania, Shobhan Lal Nagin Chand & Co.
5. Chemistry in Engineering & Technology, Vol.I & Vol.II, Rajaram, Kuriacose (TMH).
6. Physical Chemistry, P.W.Atkin (ELBS, Oxford Press)
7. Physical Chemistry, W.J.Moore (Orient Longman)

FOUNDATION OF INFORMATION TECHNOLOGY(IT – 1002)

Course Code	**IT – 1002**	Credits : 4	L-3, T-1, P-0
Name of the Course	**FOUNDATION OF INFORMATION TECHNOLOGY**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

Information concept and Processing: Definition of Information, Need for Information, Quality of Information, Value of Information, Categories and Levels of information in Business Organization, Data concepts and Data Processing, data representation – Number system.

Computer Appreciation: Definition of an Electronic Digital Computer, history, Generations, Characteristics and applications of Computers, classification of Computers.

Elements of Computers Processing System: Hardware CPU, Peripherals, Storage Media, Software Definition, Role and Categories, Firmware and Human ware.

SECTION – B

Communication: Need for communication, Data Transmission, Baud, Bandwidth, Data transmission rate, Channel Capacity, transmission impairments, Signal noise ratio.

Transmission media (twisted cables, Micro wave and radio wave, Optical fiber and satellite) and communication through these media.

A/D and D/A, Modulation, Multiplexing-FDM, TDM.
Communication techniques: circuit switching, message switching and packet switching and their advantages and disadvantages.

SECTION – C

Networking Essentials: Networking of Computer – Introduction of LAN and WAN, Types of LAN, Basic ISO-OSI model of LAN, client – Sever Architecture's.

Programming Language Classification: Computer Languages, Generation of Languages, Translators – Interpreters, Compilers, Assembles, Introduction to 4GLS.

SECTION – D

Information Technology Applications: Multimedia introduction, tools graphics, sound, video and animations. Artificial intelligence (AI) – Basic concepts of AI and Expert systems.

Latest IT enabled business applications: Basic concepts with definitions and short introduction of Enterprise Resource Planning (ERP), Customer relationship Management (CRM) Supply Chain Management (SCM), E-Commerce. Awareness of Ongoing IT Projects in India such as NICNET, ERNET, INFLIBNET etc.

Books:

1. Rajaram,V.: Introduction to Computer.
2. Morris: Computer Organisation.
3. Hamacher: Computer Organisation.
4. Kanter: Managing Information System.
5. Vital N: Information Technology India Tomorrow.
6. Murthy C.S.V: Fundamentals & Information Technology.

SCIENCE, TECHNOLOGY AND SOCIETY (HU – 1002)

Course Code	**HU – 1002**	Credits : 4	L-3, T-1, P-0
Name of the Course	**SCIENCE, TECHNOLOGY AND SOCIETY**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

1. Science, Technology and Engineering, as knowledge and as social and professional activities.
2. Inter-relationship of technology growth and social, economic and cultural growth: historical perspective.
3. Ancient, medieval and modern technology/Industrial revolution and its impact. The Indian Science and Technology.

SECTION – B

1. Social and Human critiques of technology: Mumford and Ellul.
2. Rapid technological growth and depletion of resources. Reports of the club of Rome.
3. Energy crisis; renewable energy resources.
4. Environmental degradation and pollution. Eco-friendly technologies. Environmental regulations. Environmental ethics.

SECTION – C

1. Technology and the arms race. The nuclear threat.
2. Appropriate technology movement Schumacher; later developments.
3. Technology and the developing nations. Problems of technology transfer. Technology assessment/impact analysis.
4. Human operator in Engineering projects and industries Problems of man machine interaction. Impact of assembly line and automation. Human centered technology.

SECTION – D

1. Industrial hazards and safety. Safety regulations. Safety Engineering.
2. Politics and technology. Authoritarian versus democratic control of technology. Social and ethical audit of industrial organizations.
3. Engineering profession. Ethical issues in Engineering practice, Conflicts between business demands and professional ideals. Social and Ethical responsibilities of the engineer. Codes of professional ethics. Whistle blowing and beyond. Case studies.

BOOKS:

1. Appleyard, R.ed. 1989. the impact of international migration on developing countries paris: OECD.
2. Barger, Bernard 1952 science and the social order New York: Free Press.
3. Gaillard, J 1991. Scientists in the third world Lexington: Kentucky University Press.
4. Gaillard, J., V.V.Krishna and R.Waast, eds. 1997. Scientific communities in the developing world New Delhi: Sage.
5. Kamala Cahubey ed. 1974. Science policy and national development New Delhi: Macmillan.
6. Krishna, V.V.1993. S.S.Bhatnagar on science, technology and development 1938-54 New Delhi: Wiley Eastern.
7. Kornhauser, William, 1962 Scientists in industry, Berkley; University of California Press, price, Derek J.dSolla, 1963 little science, big science New York Columbia University Press.
8. Rahman, A.1972 Trimurti: Science, Technology and society – A collection of essays New Delhi: Peoples Publishing House.
9. Storer, Norman W.1966. The social system of science New York: Holt Rinehart and Winston.
10. UNCTAD/CSIR Case study in reverse transfer of technology: A survey of problems and policy in India Doc. TD/B/C.6AC.4/6 and Corr.1, Geneva.
11. Crne, Diana. 1965. “scientists at major and minor universities: A study of productivity and recognition’” American sociological review, 30 (5) , Pp. 699-714.
12. Coler, Myron A.ed 1963 Essays on the creativity in the sciences New York: New York University Press.
13. Debroy, Bibek. 1996. Beyond the Uruguay round: The Indian perspective on GATT New Delhi: Sage.
14. Gilpin, Robert, and Christopher Wright eds. 1964. Scientists and national policy making New York: Columbia University Press.
15. Kumar, Nagesh and N.S.Siddharthan. 1997. Technology, market structures and internationalization: Issues and policies for developing countries London: Routlege and the united National University.
16. MacLeod, Roy and Deepak Kumar, 1995. Technology and the raj: Western technology and technical transfers to India, 1700-1947 New Delhi: Saga.
17. Merton, Robert K.1938. “Science, technology and society in seventeenth – century England” Osiris (Bruges, Belgium), 14 Pp.360-632.

BASIC ELECTRICAL ENGINEERING (EE – 1001)

Course Code	**EE – 1001**	Credits : 4	L-3, T-1, P-0
Name of the Course	**BASIC ELECTRICAL ENGINEERING**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

Section A:

D.C. circuits: Ohm's law, Kirchoff's Laws, Thevenin's, Norton's, superposition theorem, Maximum power transfer theorem, Reciprocity, Compensation, Millman and Tellegan's Theorem . D.C. circuits, Nodal and Mesh analysis.

A.C. circuits: Sinusoidal signal, instantaneous and peak values, RMS and average values, phase angle, polar and rectangular, exponential and trigonometric representations RL and C components, behavior of these components in A.C. circuits, concept of complex power, power factor.

Transient Response: transient response RL, RC and RLC circuits with step input.

Section B:

Series and Parallel A.C. circuits: Series and Parallel A.C. circuit, Series and Parallel resonance. Q factor, cut off frequency and bandwidth.

Three phase circuits: Phase and line voltages and currents, balanced star and delta circuits, power equation, measurement of power by 2-wattmeter method, importance of earthing.

Section C:

Transformers: Principle, construction and working of transformer, Efficiency and regulation.

Electrical Machines: Introduction to D.C. Machines, induction motor, Synchronous machines.

Section D:

Measuring Instruments: Voltmeter, Ammeter, Wattmeter, Energy meter.

Batteries: Storage batteries:- Types, construction, charging and discharging, capacity and efficiency.

Books:

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

Deltoro: Electrical Engg Fundamentals, PHI.

BASIC MECHANICAL ENGINEERING(ME – 1003)

Course Code	**ME - 1003**	Credits: 4	L-4, T-1, P-0
Name of the Course	**Basic Mechanical Engineering**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Maximum Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

First Law of Thermodynamics

Essence and corollaries of the first law, analytical expressions applicable to a process and cycle, internal energy, enthalpy and specific heats, first law analysis of steady flow, applications of steady flow energy equation to engineering devices.

Applications of first law of Thermodynamics

Closed and open systems, analysis of non-flow and flow processes for an ideal gas under constant volume (Isochoric), constant pressure (Isobaric), constant temperature (Isothermal), adiabatic and polytropic conditions. Analysis of free expansion and throttling processes. Representation of these processes on P-V charts and analysis of property changes and energy exchange (work and heat) during these processes.

SECTION – B

Second Law of Thermodynamics

Limitations of first law, various statements of second law and their equivalence, application of statements of second law to heat engine, heat pump and refrigerator. Philosophy of Carnot cycle and its consequences. Carnot theorem for heat engines and heat pump. Classius inequality, concept and philosophy of entropy and entropy changes during various processes. Temperature – entropy chart and representation of various processes on it. Third law of thermodynamics.

SECTION – C

Simple Stresses & Strains

Concept & types of Stresses and strains, Poisson's ratio, stresses and strain in simple and compound bars under axial loading, stress strain diagrams, Hooks law, Elastic constants and their relationships. Temperature stress and strain in simple and compound bars under axial loading, Numerical problems.

Shear Force and Bending Moments

Definitions, SF & BM diagrams for cantilevers, simply supported beams with or without over-hang and calculation of maximum BM and SF and the point of contraflexture under (i) concentrated loads, (ii) uniformly distributed loads over whole span or a part of it, (iii) combination of concentrated loads and uniformly distributed loads. Relation between the rate of loading, the shear force and the bending moments, Numerical Problems.

SECTION – D

Bending Stresses in Beams

Bending Stresses in Beams with derivation of Bending equation and its application to beams of circular, rectangular I & T Section, Composite beams,

Torsion of Circular Members

Torsion of Solid and hollow circular shafts, Combined bending and torsion, Equivalent torque, Numerical Problems.

Text Books

1. Nag, P.K., "Engineering Thermodynamics", Tata McGraw – Hill, New Delhi.
2. Yadav, R., Thermal Science and Engineering, Central Publishing House, Allahabad.
3. Strength of Materials – G.H.Ryder – Third Edition in S I units 1969 Macmillan India.
4. Mechanics of Materials – Dr. Kirpal Singh, Standard Publishers Distributors, New Delhi.

Reference Books

1. Strength of Materials – Popoy, PHI, New Delhi.
2. Strength of Materials – Sadhu Singh, Khanna Publications.
3. Strength of Materials – A Rudimentary Approach – M.A.Jayaram, Revised Ed. 2001, Sapna Book House, Bangalore.

4. Strength of Materials – U.C.Jindal
5. Moran, M.J. and Shapiro, H.N., Fundamentals of Engineering Thermodynamics, John Wiley, New York.
6. Van Wylen, G.J., Fundamental of Classic Thermodynamics, John Wiley, New York.
7. Spalding, D.B. and Cole, E.H., Engineering Thermodynamics, ELBS, New Delhi.
8. Hibbeler, R.C. Engineering Mechanics – Statics, Addison Wesley Longman, New Delhi.

APPLIED CHEMISTRY LAB(AS – 1005)

Course Code	**AS – 1005**	Credits : 2	L-0, T-0, P-3
Name of the Course	**APPLIED CHEMISTRY LAB**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time : 3 hrs**	**Max. Marks : 50**	**Min. Pass Marks : 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 30%, Viva 30%, Attendance 10%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i) Performing a practical examination assigned by the examiner (25 marks).
ii) Viva-voce examination (25 marks).

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

NOTE:At least 8 experiments to be performed.

List of Experiments

1. To determine the surface tension of the given liquid by drop number method by using Stalgmometer and identify the given liquid.
2. To determine the insoluble, soluble and total solids in given sample of sewage.
3. To determine the solid carbon, volatile matter, ash content and percentage of moisture in given sample of coal by proximate analysis method and classify the coal.
4. To determine the total alkalinity in a given sample of water using a standard acid. Ask for what you want
5. To determine the percentage of Chlorine in a given sample of Caocl2 which has been dissolved in one litre of solution.
6. To determine the surface tension of the two given unknown liquids by using Stalgmometer and identify the given liquid.
7. To determine the fineness of a given sample of cement by solving through standard 75:90 micro sieve.
8. To determine the coefficient of viscosity of the given unknown liquids by using Ostwald's Viscometer and identify the given liquid.
9. To determine the coefficient of viscosity of the given unknown liquids by using Ostwald's Viscometer and identify the given liquid.
10. To determine the coefficient of viscosity of the given lubricating oil using Red Wood Viscometer
11. To determine the coefficient of viscosity of the given lubricating oil using Seybolt Viscometer.
12. To determine the flash point and fire point of given sample of oil using Pens key Marten's apparatus.
13. To determine the amount of Chlorine in given sample of water approximate N/20 sodium Thiosulphate solution. Ask for your requirement.
14. Estimation of calcium as CaO volumetrically in cement
15. To determine the maximum wavelength of solution of cobalt chloride
16. To determine the Beer's Law and apply it to find the concentration of given unknown solution by spectra-photometer.
17. To determine the chemical oxygen demand of waste water.
18. To determine the half-life period of given radioactive sample using GM counter.

MAT LAB (IT– 1003)

Course Code	**IT– 1003**	Credits : 2	L-0, T-0, P-3
Name of the Course	**MAT LAB**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time : 3 hrs**	**Max. Marks : 50**	**Min. Pass Marks : 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 30%, Viva 30%, Attendance 10%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i) Performing a practical examination assigned by the examiner (25 marks).
ii) Viva-voce examination (25 marks).

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.
The aim of this laboratory is to help students get an idea about a programming environment very widely used by engineer to solve the problem in their respective disciplines.

Exercises on computer

i. Roots of a quadratic equation.
ii. Guessing a number
iii. Units conversion
iv. Factorial program
v. Simulation of RC circuit
vi. V-I characteristics of a MOSFET.
vii. Finding average with dynamic array.
viii. Writing a binary file
ix. Reading a binary file
x. Plotting one dimensional and two dimensional graph using MAT LAB 2-D plot types.
xi. Using functions in MAT LAB Environment

To teacher concerned will give at least 10 exercises to solve non trivial problems using MAT LAB environment.

BOOKS:

1. Programming in MAT LAB, Marc E.Herniter, Thomson ASIA Ptd. Ltd Singapore(2001)
2. MAT LAB, the languages of computing; The maths work inc.

BASIC ELECTRICAL ENGINEERING LAB(EE– 1002)

Course Code	**EE – 1002**	Credits : 2	L-0, T-0, P-3
Name of the Course	**BASIC ELECTRICAL ENGINEERING LAB**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time : 3 hrs**	**Max. Marks : 50**	**Min. Pass Marks : 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 30%, Viva 30%, Attendance 10%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i) Performing a practical examination assigned by the examiner (25 marks).
ii) Viva-voce examination (25 marks).

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

List of Experiments

1. To verify KCL and KVL.
2. TO study frequency response of series RLC circuit and determine resonance frequency and Q factor for various values of R,L,C
3. TO study frequency response of parallel RLC circuit and determine resonance frequency and Q factor for various values of R,L,C
4. To perform direct load test of transformer and plot efficiency v/s load characteristics.
5. To perform direct load test of the DC shunt generator and plot load v/s current curve.
6. To study and verify Thevenins, Norton’s, superposition, Milliman’s, maximum power, reciprocity.
7. To perform O.C and S.C test of transformer.
8. to study various types of meters
9. Measurement of power by 3 voltmeter/ 3 ammeter method.
10. Measurement of power in 3-phase system by 2-wattmeter method.

WORKSHOP PRACTICE – II(ME– 1004)

Course Code	**ME– 1004**	Credits : 2	L-0, T-0, P-3
Name of the Course	**WORKSHOP PRACTICE –II**		
Lectures to be delivered	**26hours of Lab sessions**		
Semester End Examination	**Max. Time : 3 hrs**	**Max. Marks : 50**	**Min. Pass Marks : 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 30%, Viva 30%, Attendance 10%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i) Performing a practical examination assigned by the examiner (25 marks).

ii) Viva-voce examination (25 marks).

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

List of Experiments

Fitting shop:-

1. Drilling and Tapping in M.S. piece
2. To make a male-female joint (taper type) of mild steel.

Machine Shop :-

1. To perform boring operation on lathe machine.
2. To perform knurling and threading operation on lathe machine.
3. step turning operation on a lathe machine

Carpentry and Pattern making shop:-

1. To make a single piece pattern of connecting rod.
2. To make a self cod pattern.
3. To make a split pattern.

Welding shop:-

1. To make V butt joint in horizontal position.
2. To make a V butt joint in vertical position.
3. To perform Gas welding operation.

Smithy and Forging:-

1. To make a cube from a circular bar.
2. To make a tong using hot forging operations
3. To perform drawing down operation.

Foundry Shop:-

1. To make a mould and perform casting operation.
2. Study of casting defects and remedies.

Books:

1. Workshop Technologies By Chapman
2. Manufacturing Processes by Begam
3. Manufacturing Materials And Processes By JS Campbell
4. Introduction To Electrical Wiring
5. Exercises And Prepration Of PCBs Involving soldering of electrical and electronic applications.

INFORMATION TECHNOLOGY TRAINER WORKSHOP II(IT – 1004)

Course Code	**IT – 1004**	Credits : 2	L-0, T-0, P-3
Name of the Course	**INFORMATION TECHNOLOGY TRAINER WORKSHOP II**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time : 3 hrs**	**Max. Marks : 50**	**Min. Pass Marks : 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 30%, Viva 30%, Attendance 10%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:
i) Performing a practical examination assigned by the examiner (25 marks).
ii) Viva-voce examination (25 marks).

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester

List of Experiments

This workshop will provide training of different types of operating systems (Windows98,LINUX) with hands on experiments on the following:

1. Installation of operating system.
2. Configuration of Hard Disk.
3. Configuration of Display Cards.
4. Configuration of sound cards.
5. Configuration of CDROM.
6. Configuration of Mouse.
7. Configuration of Printer.
8. Configuration of Display Cards.
9. Configuration of Network Cards.
10. Configuration of Modems.
11. Understanding Boot up process.
12. Creating and using emergency Disk.
13. Troubleshooting exercises related to various components of computer like Monitor drives, memory, printers etc.
14. Assembling a PC.

BASIC MECHANICAL ENGG. LAB(ME – 1005)

Course Code	**ME – 1005**	Credits : 2	L-0, T-0, P-3
Name of the Course	**BASIC MECHANICAL ENGG. LAB**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time : 3 hrs**	**Max. Marks : 50**	**Min. Pass Marks : 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 30%, Viva 30%, Attendance 10%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i) Performing a practical examination assigned by the examiner (25 marks).

ii) Viva-voce examination (25 marks).

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

LIST OF EXPERIMENTS

1. To study low-pressure boilers.
2. To study High-pressure boilers.
3. Calibration of thermometers.
4. Calibration of pressure gauges.
5. Study of discharge measuring devices.
6. To determine co-efficient of discharge of orifice meter.
7. To verify the Bernoulli's Theorem.
8. To find Young's Modulus of Elasticity using Searl's apparatus.
9. To find Young's Modulus of Elasticity of a beam with deflection beam apparatus.
10. To find Modulus of rigidity with the help of torsion apparatus.