YMCA UNIVERSITY OF SCIENCE AND TECHNOLOGY
FARIDABAD

Scheme and Syllabus

B.Tech- 1st year(All Courses)

(Semester I and II)

Session- Wef. 2017-18

YMCA UNIVERSITY OF SCIENCE AND TECHNOLOGY, FARIDABAD
PROPOSED SCHEME OF INSTRUCTION
B.TECH 1st YEAR (SEMESTER -I) (ALL BRANCHES) COURSE STRUCTURE

Course Notation	Course Code	Course Title	L	T	P	Credits	Sessional	External	Category Code
C	HAS-101C	Physics-I	4	-	-	4	25	75	BSC
C	HAS-103C	Mathematics-I	4	-	-	4	25	75	BSC
A	HAS-105C	Chemistry	3	-	-	3	25	75	BSC
B	HAS-109C	Interactive English	3	-	-	3	25	75	AECC
B	EE-101C	Basic Electrical Engineering	3	-	-	3	25	75	BEC
A	HAS-107C	Environmental Science	3	-	-	3	25	75	AECC
B	CE-101C	Fundamentals of Computer & Programming with C	3	-	-	3	25	75	BEC
A	EC-101C	Elements of Electronics Engg.	3	-	-	3	25	75	BEC
A	ME-101C	Basics of Mechanical Engg.	3	-	-	3	25	75	BEC
B	ME-152C	Engineering Drawing	-	-	4	2	30	70	BEC
C	HAS-151C	Physics Lab-I	-	-	2	1	15	35	BSC
B	CE-151C	Fundamentals of Computer & Programming with C Lab	-	-	2	1	15	35	BEC
A	HAS-155C	Chemistry Lab	-	-	2	1	15	35	BSC
B	EE-151C	Basic Electrical Engineering Lab	-	-	2	1	15	35	BEC
A	ME-151C	Basics of Mechanical Engg Lab	-	-	2	1	15	35	BEC
B	HAS-159C	Language lab	-	-	2	1	15	35	AECC
C	WS-161C	Workshop-I	-	-	6	3	30	70	SEC

Note: Exams duration will be as under

a. Theory exams will be of 03 hours duration.
b. Practical exams will be of 02 hours duration
c. Workshop exam will be of 03 hours duration

YMCA UNIVERSITY OF SCIENCE AND TECHNOLOGY, FARIDABAD
PROPOSED SCHEME OF INSTRUCTION
B.TECH 1st YEAR (SEMESTER -II) (ALL BRANCHES) COURSE STRUCTURE

Course Notation	Course Code	Course Title	L	T	P	Credits	Sessional	External	Category Code
C	HAS-102C	Physics-II	4	-	-	4	25	75	BSC
C	HAS-104C	Mathematics-II	4	-	-	4	25	75	BSC
A	HAS-109C	Interactive English	3	-	-	3	25	75	AECC
B	HAS-105C	Chemistry	3	-	-	3	25	75	BSC
A	EE-101C	Basic Electrical Engineering	3	-	-	3	25	75	BEC
B	HAS-107C	Environmental Science	3	-	-	3	25	75	AECC
A	CE-101C	Fundamentals of Computer & Programming with C	3	-	-	3	25	75	BEC
B	EC-101C	Elements of Electronics Engg.	3	-	-	3	25	75	BEC
B	ME-101C	Basics of Mechanical Engg.	3	-	-	3	25	75	BEC
C	HAS-152C	Physics Lab-II	-	-	2	1	15	35	BSC
A	CE-151C	Fundamentals of Computer & Programming with C Lab	-	-	2	1	15	35	BEC
B	HAS-155C	Chemistry Lab	-	-	2	1	15	35	BSC
A	EE-151C	Basic Electrical Engineering Lab	-	-	2	1	15	35	BEC
B	ME-151C	Basics of Mechanical Engg Lab	-	-	2	1	15	35	BEC
A	HAS-159C	Language lab	-	-	2	1	15	35	AECC
A	ME-152C	Engineering Drawing	-	-	4	2	30	70	BEC
C	WS-162C	Workshop- II	-	-	6	3	30	70	SEC

Note: Exams duration will be as under

a. Theory exams will be of 03 hours duration.
b. Practical exams will be of 02 hours duration
c. Workshop exam will be of 03 hours duration

Important Notes:
Significance of the Course Notations used in this scheme: -
C = These courses are common to both the groups Group-A and Group -B.
A = Other compulsory courses for Group-A.
B = Other compulsory courses for Group-B.

Students will study either
Group A (HAS-105C, HAS-107C, EC-101C, ME-101C, HAS-155C, ME-151C)
OR
Group B (EE-101C, HAS-109C, CE-101C, ME-152C, CE-151C, HAS-159C, EE-151C)

Total Marks in Semester-I for Group - A/B = 850/900
Total Marks in semester-II for Group -A/B = 900/850
Total Marks = 1750

Nomenclature of Category Code:

BSC- Basic Science Course

AECC- Ability Enhancement Compulsory Course

BEC- Basic Engineering Course

SEC-Skill Enhancement Course

Note: For workshop syllabus, Institutes need to choose Group I/II for Semester 1/2.

HAS-101C PHYSICS I
B. Tech I Semester

No. of Credits: 4	Sessional:	25 Marks
L T P Total	Theory:	75 Marks
4 0 0 4	Total :	100 Marks
	Duration of Exam:	3 Hours

Pre –Requisite: None

Successive: Physics II, Engineering Mechanics, Material Science

Course Objective:

The objective of the course is to make the students familiar with topics of general physical optics like interference, diffraction, polarization, fiber optics, lasers. The second part of the syllabus consists of theory of relativity, electrostatics and electrodynamics.

Course Outcomes (COs): At the end of the course, the student shall be able to:

CO 1- Understand the basics of interference and diffraction.

CO 2- Understand the phenomenon of polarization and have elementary knowledge of lasers and fibre optics.

CO 3- Know the fundamentals of Electrostatics and Electrodynamics.

CO 4- Comprehend the basics of special theory of relativity.

Syllabus:

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

Diffraction: Difference between interference and diffraction Fraunhofer and Fresnel diffraction. Fraunhofer diffraction through a single slit, Plane transmission diffraction grating, absent spectra, dispersive power, resolving power and Rayleigh criterion of resolution.

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

Laser and Fibre Optics: Spontaneous and Stimulated emission, Laser principle, Einstein's coefficients, characteristics of laser beam-concept of coherence, spatial and temporal coherence, He-Ne and semiconductor lasers (simple ideas), applications.

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

UNIT III **Electrostatics:** Dielectric polarization, dielectric relaxation process, types of polarization, relation between E,P and D, Gauss's law in the presence of a dielectric, Energy stored in a uniform electric field, dielectric losses and variation with frequency.

Electrodynamics: Maxwell's field equations –significance, differential and integral form, Maxwell's equations in different media- free space, dielectric and conductor.

UNIT IV **Special Theory of Relativity:** Inertial and non-inertial frames, Galilean transformations, Michelson's Morley Experiment, Postulates of Special Theory of Relativity, Lorentz transformations, Consequences of LT (length contraction and time dilation), addition of velocities, variation of mass with velocity, mass energy equivalence.

Text Books

1. Perspectives of Modern Physics - Arthur Beiser (TMH)
2. Optics – Ajoy Ghatak (TMH)
3. Modern Physics for Engineers – S.P.Taneja (R. Chand)
4. Engineering Physics – Satya Prakash (Pragati Prakashan)
5. Modern Engineering Physics – A.S.Vasudeva (S. Chand)
6. Engineering Physics (Vol-1)- S.L. Gupta (Dhanpat Rai)

Reference Books:

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

HAS-103C MATHEMATICS I

B. Tech I Semester

No. of Credits: 4		Sessional:	25 Marks
L T P Total		Theory:	75 Marks
4 0 0 4		Total :	100 Marks
		Duration of Exam:	3 Hours

Pre –Requisite: None

Successive: Mathematics II, Numerical Methods, Operations Research

Course Objective:

To make students able to learn about matrices, rank, Eigen values and Eigen vectors and about the quadratic form of the matrices, Taylor's series, Macluarin's series, Asymptotes, Curvature, partial differentiation, Composite and Implicit functions, Maxima-Minima of functions of two variables, Differentiation under the integral sign, Double Integral, Triple Integral, Beta & Gamma functions, Scalar and Vector-point functions, gradient, divergence and curl of a vector, Green's theorem, Stoke's theorem, Gauss-Divergence theorem and their application.

Course Outcomes (COs): At the end of the course, the student shall be able to:

CO 1- Learn about matrices, rank, eigen values and eigen vectors and about the quadratic form of the matrices.

CO 2- Learn about Taylor's series, Macluarin's series , Asymptotes, Curvature, Students learn about partial differentiation, Composite and Implicit functions, Maxima-Minima of functions of two variables, Differentiation under the integral sign.

CO 3- Learn about Double integral, Triple integral, Beta & Gamma functions and their applications.

CO 4- Acquire knowledge about scalar and vector point function, gradient, divergence and curl ,Green's ,Divergence and Stoke's theorem and their applications.

Syllabus:

UNIT I **Matrices and its Applications:** Rank of Matrix, Normal form, Inverse using Gauss-Jordon method, Consistency of linear system of equations using Rank method, Linear and Orthogonal transformation, Linear-dependence and Linear-Independence of Vectors, Eigen-Values and its properties, Eigen-Vectors, Cayley-Hamilton theorem & its applications, Diagonalisation of Matrices, Similar Matrices, Quadratic Forms.

UNIT II **Applications of Derivatives:** Taylor's & Maclaurin's Series for one variable, Asymptotes, Curvature, Radius of Curvature for Cartesian, Parametric and Polar-curves, Radius of curvature at the Origin (by using Newton's method, by method of Expansion), Center of curvature.

Partial Differentiation and its Applications: Functions of two or more variables, Partial derivatives of I^{st} and higher order, Total differential and differentiability, Euler's theorem for Homogeneous functions, Derivatives of Composite and Implicit functions, Jacobians, Taylor's series for functions of two variables, Maxima-Minima of functions of two variables, Lagrange's Method of undetermined multipliers, Differentiation under the integral sign (Leibnitz rule).

UNIT III **Double and Triple Integrations:** Double integral, Change of Order of Integration, Double integral in Polar co-ordinates, Applications of double integral to find (i) Area enclosed by plane curves (ii) Volume of solids of revolution, Triple Integral, Change of variables, Volume of solids, Beta & Gamma functions and relation between them.

UNIT IV **Vector Calculus:** Differentiation of vectors, Scalar and Vector-point functions, Gradient of a scalar field and directional derivatives, Divergence and Curl of a vector field and their physical interpretations, Integration of vectors, line integral, Surface integral, Volume integral, Green's theorem, Stoke's theorem, Gauss-Divergence theorem(without proof) with their simple applications.

Text Books/ Reference Books:

1. Advanced Engineering Mathematics, Erwin Kreyzig
2. B.S.Grewal, Higher Engg. Mathematics, Khanna Publications.
3. Advanced Engineering Mathematics, Dr.Babu Ram, Pearsons publications.
4. Engineering Mathematics Seventh Edition by John Bird, Published by Newnes.
5. Advanced Engineering Mathematics, K.A.Stroud, Dexter Booth, Published by Palgrave.

HAS-105C CHEMISTRY
B. Tech I/II Semester

No. of Credits: 3	Sessional:	25 Marks
L T P Total	Theory:	75 Marks
3 0 0 3	Total :	100 Marks
	Duration of Exam:	3 Hours

Pre –Requisite: None

Successive: Material Science

Course Objective:

To illustrate the basic understanding of Analytical chemistry and to improve the reasoning ability of the student towards chemistry in everyday life, enhance the basic knowledge for the theoretical aspect of engineering chemistry. To make students aware about the various applications of chemical sciences in engineering.

Course Outcomes (COs): At the end of the program the students acquired knowledge about:

CO 1- Illustrate the basic parameters of water, different water softening processes and effect of hard water in industries.

CO 2- Describe the basic properties and application of various polymers as an engineering material.

CO 3- Demonstrate the mechanism, physical and chemical properties of lubricants and their applications.

CO 4- Apply instrumental techniques of chemical analysis.

Syllabus:

UNIT I **Polymers and Polymerization:** Introduction & Classification of polymers. effect of structure on properties of polymers, Bio degradable polymers, preparation, properties and technical application of thermo–plastics (PVC, PE, Teflon)& thermosets (PF,UF), elastomers (SBR,BUNA-N), Silicones, Introduction to polymeric composites.

Phaserule: Terminology, Derivation of Gibb's phase rule. One component system: water system, two components systems: Simple eutectic system (Pb – Ag), system with congruent melting point (Zn – Mg), Cooling curves.

UNIT II **Water and its Treatment:** Hardness of water and its determination, (EDTA method) units of hardness, alkalinity of water and its determination, Related

numerical problems, Problems associated with boiler feed water: scale and sludge formation, Priming and foaming, Boiler corrosion & Caustic embrittlement. Water softening Techniques: Lime-Soda treatment, Zeolite, Ion – exchange process, Mixed bed demineralization.

UNIT III **Corrosion and its Prevention:** Mechanism of Dry and wet corrosion (rusting of iron), types of corrosion, galvanic corrosion, differential aeration corrosion, stress corrosion. Factors affecting corrosion, preventive measures (proper design, Cathodic and Anodic protection, Protective coatings), Soil corrosion, Microbiological Corrosion.

Lubrication and Lubricants: Introduction, mechanism of lubrication, classification of lubricants. Additives for lubricants. Properties of lubricants (Flash & Fire point, Saponification number, Iodine value, Acid value, Viscosity and Viscosity index Aniline point, Cloud point and pour point).

UNIT IV **Fuels:** Definition and characteristics of a good fuel, Classification of fuels with suitable examples, Definition and determination of calorific value of a fuel with the help of bomb calorimeter, Proximate and Ultimate analysis of a fuel and its importance, Merits and demerits of gaseous fuel over other varieties of fuel, Composition properties and uses of (i) Water gas (ii) Oil gas (iii) Biogas (iv) LPG (v) CNG.

Books recommended

1. Engineering Chemistry , P.C. Jain, Monica Jain (DhanpatRai& Co)
2. Chemistry in Engineering &Tech , Vol. I & II , Kuriacose (TMH)
3. Instrumental methods of Chemical analysis, MERITT & WILLARD(EAST -WEST press)
4. Physical Chemistry , P.W Atkin (ELBS, OXFORD Press)
5. Physical Chemistry W.J.Moore (Orient Longman)

HAS-107C ENVIRONMENTAL STUDIES

B. Tech I/II Semester

No. of Credits: 3	Sessional:	25 Marks
L T P Total	Theory:	75 Marks
3 0 0 3	Total :	100 Marks
	Duration of Exam:	3 Hours

Pre –Requisite: None

Successive: None

Course Objective:

The prime objective of the course is to provide the students a detailed knowledge on the threats and challenges to the environment due to developmental activities. The students will be able to identify the natural resources and suitable methods for their conservation and sustainable development. The focus will be on awareness of the students about the importance of ecosystem and biodiversity for maintaining ecological balance. The students will learn about various attributes of pollution management and waste management practices. The course will also describe the social issues both rural and urban environment and environmental legislation.

Course Outcomes (COs): At the end of the program the students acquired knowledge about:

CO 1- Understand / evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn help in sustainable development. The students will also be able to introduce the thinking about environmental issues from an interdisciplinary perspective.

CO 2- Identify and relate about the renewable and non-renewable resources, their importance and ways of conservation to sustain human life on earth.

CO 3- Know about the concepts of ecosystem and its function in the environment, the need for protecting the producers and consumers in various ecosystems and their role in the food web.

CO 4- Recognize, relate and become sensitive to the effects of pollution and will be able to contribute his learning's towards their prevention or mitigation. The students will also be able to describe the social issues along with the trends of human population growth and the possible means to combat the challenges.

Syllabus:

UNIT I **The Multidisciplinary Nature of Environmental Studies:** Definition, scope and importance. Need for public awareness.

UNIT II **Natural Resources: Renewable and Non-Renewable Resources:** Natural resources and associated problems:

- Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
- Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
- Mineral resources: Use and exploitation, environmental effects of extracting and mineral resources, case studies.

  Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.
- Energy resources: Growing energy needs, renewable and non- renewable energy sources, use of alternate energy sources. Case studies.
- Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.
- Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

UNIT III **Ecosystems:**

- Concept of an ecosystem. Structure and function of an ecosystem. Producers, consumers and decomposers.
- Energy flow in the ecosystem. Ecological succession. Food chains, food webs and ecological pyramids.
- Introduction, types, characteristic features, structure and function of the following ecosystem:

  a) Forest ecosystem b) Grassland ecosystem c) Desert ecosystem d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

UNIT IV **Biodiversity and its Conservation:**

- Introduction – Definition: genetic, species and ecosystem diversity.
- Biogeographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. Biodiversity at global, National and local levels.
- India as a mega-diversity nation. Hot-spots of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India. Conservation of biodiversity: in-situ and ex-situ conservation of biodiversity.

UNIT V **Environmental Pollution:** Definition.

- Causes, effects and control measures of: Air pollution b) Water pollution c) Soil pollution d) Marine pollution e) Noise pollution f) Thermal pollution g) Nuclear hazards
- Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies. Disaster management: floods, earthquake, cyclone and landslides.

UNIT VI **Social Issues and the Environment:**

- From Unsustainable to Sustainable development Urban problems related to energy. Water conservation, rain water harvesting, watershed management. Resettlement and rehabilitation of people; its problems and concerns. Case studies.
- Environmental ethics: Issues and possible solutions. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies. Wasteland reclamation. Consumerism and waste products.
- Environment Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and Control of Pollution) Act
- Wildlife Protection Act. Forest Conservation Act. Issues involved in enforcement of environmental legislation
- Public awareness.

UNIT VII **Human Population and the Environment:** Population growth, variation among nations. Population explosion – Family Welfare Programme.

Environment and human health. Human Rights. Value Education. HIV/AIDS. Women and Child Welfare. Role of Information Technology in Environment and human health. Case Studies.

UNIT VIII **Field Work:**

- Visit to a local area to document environmental assets-river / forest / grassland / hill / mountain.
- Visit to a local polluted site – Urban / Rural / Industrial / Agricultural.
- Study of common plants, insects, birds.
- Study of simple ecosystems – pond, river, hill slopes, etc.

Text Books:

1. Perspectives in Environmental Studies by A. Kaushik and C. P. Kaushik, New age international publishers.
2. Environmental Studies by Benny Joseph, Tata McGraw Hill Co, New Delhi

Reference Books:

1. Environmental Science: towards a sustainable future by Richard T. Wright. 2008 PHL Learning Private Ltd. New Delhi.
2. Environmental Engineering and science by Gilbert M. Masters and Wendell P. Ela 2008 PHI Learning Pvt Ltd.
3. Environmental Science by Daniel B. Botkin& Edwards A. Keller, Wiley INDIA edition.
4. Fundamentals of Ecology by Odum, E.P., Barrick, M. and Barret, G.W. Thomson Brooks/Cole Publisher, California, 2005.

EC- 101C ELEMENTS OF ELECTRONICS ENGINEERING

B. Tech I/II Semester

No. of Credits: 3		Sessional:	25 Marks
L T P Total		Theory:	75 Marks
3 0 0 3		Total :	100 Marks
		Duration of Exam:	3 Hours

Pre –Requisite: None

Successive: Material Science, Mechatronics, Industrial Control

Course Objective:

Fundamental knowledge in the field of electronics will be provided in this course by emphasizing on the basic components and circuits like the diodes, BJTs, JFETS, MOSFETS etc. Such different types of circuitry components/circuits and their applications are introduced so as to complete the theoretical and practical basis on analog circuit design.

Course Outcomes (COs): At the end of the program the students acquired knowledge about:

CO 1- Basics of digital electronics, solving problems related to number systems and Boolean algebra, various flip flops.

CO 2- The semiconductors and diodes, transistors, amplifiers and their applications.

CO 3- Display devices like LCDs, LEDs and Optoelectronic devices.

CO 4- Electronic instruments like CRO, function generator and multimeter etc.

CO 5- Basics of Communication system and modulation techniques like AM, FM, PM etc.

Syllabus:

UNIT I **Semiconductor Physics:** Overview of Semiconductors, PN junction diode and Zener diode –Diode circuits: rectifiers (bridge type only), filters, clippers and clampers - BJT construction, operation, characteristics (CB, CE and CC configurations) and uses – JFET and MOSFET construction, operation, characteristics (CS configuration) and uses.

UNIT II **Digital Electronics:** Binary, Decimal, Octal and Hexadecimal number systems and conversions, Boolean Algebra, De Morgan's theorem, logic gates (AND, OR, NOT, NAND, NOR, XOR, XNOR),Combinational and sequential circuits, Introduction to flip-flops (S-R & J-K).

UNIT III **Electronics Instruments**: Role, importance and applications of general-purpose test instruments like Multimeter: Digital & Analog, Cathode Ray Oscilloscope (CRO), Function/Signal Generator.

UNIT IV **Optoelectronic Devices and Displays:** Photoconductive cell - photovoltaic cell - solar cell – photodiodes – phototransistors, Seven segment display: Common anode and Common cathode connections and applications.

LED DISPLAY: Construction, Working, Advantages, Disadvantages and Applications.

LCD DISPLAY: Types of liquid crystals; Types of LCD display:- Dynamic scattering and field effect type; Construction, Working, Advantages, Disadvantages and Applications.

UNIT V **Communication System:** Block diagram of a basic communication system – frequency spectrum - need for modulation - methods of modulation - principles of AM, FM, PM , pulse analog and pulse digital modulation – AM / FM transmitters & receivers (block diagram description only)

Text / Reference Books:

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

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

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

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

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

ME-101C BASICS OF MECHANICAL ENGINEERING

B. Tech I / II Semester

No. of Credits: 3		Sessional:	25 Marks
L T P Total		Theory:	75 Marks
3 0 0 3		Total :	100 Marks
		Duration of Exam:	3 Hours

Pre –Requisite: None

Successive: Thermodynamics, Mechanics of Solids, Manufacturing Process

Course Objective:

The main objective of teaching this course is to provide the basic knowledge of mechanical engineering.

Course Outcome (COs): At the end of the course, the student shall be able to:

CO 1- Understand the basics of thermodynamics and I.C. Engines.

CO 2- Understand the working of various power transmission devices and lifting machines.

CO 3- Understand the concept of stresses and strains.

CO 4- Understand the basics of manufacturing processes, operations of machine tools and measuring tools.

Syllabus:

UNIT I **Basic Concepts of Thermodynamics:** Macroscopic and Microscopic Approaches, Thermodynamic Systems, Surrounding and Boundary, Thermodynamic Properties – Intensive and Extensive, Thermodynamic Equilibrium, State, Path, Process and Cycle, Concept of Thermodynamic Work and Heat, Zeroth Law of Thermodynamics, Energy and First law of Thermodynamics, First law applied to non flow processes, Internal Energy and Enthalpy. Numerical Problems.

UNIT II **I.C. Engines:** Introduction, classification, Constructional details and working of 2 stroke & 4 stroke petrol engine & diesel engine, Otto, diesel and dual cycles, simple problems on Otto & diesel cycles.

UNIT III **Simple Lifting Machines:** Definition of machine, velocity ratio, Mechanical advantage, Efficiency, Laws of machines, Reversibility of machine, Wheel and axle, Differential pulley block, Single, Double and Triple start worm and worm wheel, Simple and compound screw jacks, Problems.

UNIT IV **Basics of Power Transmission:** Transmission of mechanical power: introduction belt drives, gear drives, their advantages and disadvantages. Introduction to brakes and clutches.

UNIT V **Stresses and Strains:** Introduction, Concept & types of Stresses and Strains, Poisons ratio, stresses and Strains in simple and compound bars under axial loading, Stress– Strain diagrams, Hook's law, Elastic constants and Mechanical Properties of metals like mild steel and cast iron.

UNIT VI **Basics of Manufacturing Processes and Measurements:** Brief introduction to classification of different manufacturing processes: Primary shaping processes, metal cutting processes, joining processes, finishing processes and processes bringing change in properties, Working principle, parts and specification of commonly used machine tools in workshop such as Lathe, Shaper and Milling.

Measuring Instruments: introduction to slip gauges, Go and No Go gauges**,** dial gauges, vernier calliper, micrometer, sine bar, vernier height gauges.

Text Books:

1. Basics of Mechanical Engineering- R.K Rajput Laxmi Pub, Delhi.
2. Elements of Mechanical Engineering- D.S Kumar, S.K Kataria and Sons.
3. Engineering Thermodynamics- P.K Nag TMH, New Delhi.
4. Workshop Technology Vol I & II –Hazra & Chaudhary, Asian Book Comp., New Delhi.

Reference Books:

1. Engineering Thermodynamics- C.P Arora, Pub- TMH, New Delhi.
2. Manufacturing Science- Amitabha Ghosh & Ashok Kumar Malik, - East- West Press.
3 Manufacturing Process & Systems- Oswald, Munoz, John Wiley.
4 Workshop Technology Vol I, II & III- Chapman, WAJ, Edward Arnold.
5. Basics of Mechanical Engineering – Vineet Jain, Dhanpat Rai Publications
6. Automobile Engineering by Dr Kirpal Singh, standard Publishers Distributors

HAS-151C PHYSICS LAB - I
B. Tech I Semester

No. of Credits: 1		Sessional:	15 Marks
L T P Total		Practical:	35 Marks
0 0 2 2		Total :	50 Marks
		Duration of Exam:	2 Hours

Pre –Requisite: Physics - I

Successive: None

Course Objectives:

A physics lab reinforces the theory class with required physics lab experiments to stress the fundamental concepts of physics. Optical experiments, which will establish the fundamental interference, diffraction phenomena which will be clearly visualized with the experiment mentioned in the syllabus.

Course Outcomes (COs): After studying this course the students will be able to:

CO 1- The students are able to determine the wavelength of different colour using different instruments.

CO 2- The students are able to find the frequency using different apparatus and handle other fundamental apparatus.

CO 3- The students are able to understand optical experiments, which will establish the fundamentals of interference and diffraction phenomena.

List of Experiments:

1. To find the wavelength of sodium light by Newton's rings experiment.
2. To find the wavelength of sodium light by Fresnel's biprism experiment.
3. To find the wavelength of various colours of white light with the help of a plane transmission diffraction grating.
4. To find the refractive index and cauchy's constants of a prism by using spectrometer.
5. To find the wavelength of sodium light by Michelson interferometer.
6. To find the resolving power of a telescope.
7. To find the pitch of a screw using He-Ne laser.
8. To find the specific rotation of sugar solution by using a polarimeter.

9. To compare the capacitances of two capacitors by De'sauty bridge and hence to find the dielectric constant of a medium.
10. To find the flashing and quenching potentials of Argon and also to find the capacitance of unknown capacitor.
11. To study the photoconducting cell and hence to verify the inverse square law.
12. To find the temperature co-efficient of resistance by using platinum resistance thermometer and Callender and Griffith bridge.
13. To find the frequency of A.C. mains by using sonometer.
14. To find the velocity of ultrasonic waves in non-conducting medium by piezo-electric method.

Note :

(i) The experiments in Ist semester will be based mainly upon Optics, Electrostatics.

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

Reference Books:

1. Advanced Practical Physics – B.L. Worshnop and H.T. Flint (KPH)
2. Practical Physics – S.L.Gupta & V.Kumar (Pragati Prakashan).
3. Advanced Practical Physics Vol.I & II – Chauhan & Singh (Pragati Prakashan).

HAS-155C CHEMISTRY LAB
B. Tech I/II Semester

No. of Credits: 1		Sessional:	15 Marks
L T P Total		Practical:	35 Marks
0 0 2 2		Total :	50 Marks
		Duration of Exam:	2 Hours

Pre –Requisite: Chemistry

Successive: None

Course Objectives:

To apply fundamental knowledge of practical chemistry to engineering and technology.

Course Outcomes (COs): After studying this course the students will be able to:

CO 1- Find out hardness of water quantitatively.

CO 2- Analyse sample of water for many parameters.

CO 3- Analyse sample of lubricating oil for many parameters.

CO 4- Prepare polymeric resins in the laboratory.

List of Experiments:

15. Determination of Ca++ and Mg++ hardness of water using EDTA solution.
16. Determination of alkalinity of water sample.
17. Determination of dissolved oxygen (DO) in the given water sample
18. To find the eutectic point for a two component system by using method of cooling curve.
19. Determination of viscosity of lubricant by Red Wood Viscosity (No. 1 & N0. 2)
20. To determine flash point& fire point of an oil by Pensky Marten's flash point apparatus.
21. To Prepare Phenol formaldehyde and Urea formaldehyde resin.
22. To find out saponification no. of Oil
23. To determine TDS of Water samples of different sources.
24. Determination of concentration of KMnO4 solution spectrophotomererically
25. Determination of strength of HCl solution by titrating against NaOH solution conductometrically.
26. To determine amount of sodium and potassium in a, given water sample by flame photometer.
27. Estimation of total iron in an iron alloy.

Reference Books:

1. Advanced practical organic chemistry, O P Agarwal, (Krishna publishing).
2. Advanced practical inorganic chemistry, Gurdeep Raj, (Krishna publishing).
3. Advanced practical physical chemistry, J B Yadav, (Krishna publishing).

ME-151C BASICS OF MECHANICAL ENGINEERING LAB

B. Tech I/II Semester

No. of Credits: 1		Sessional:	15 Marks
L T P Total		Practical:	35 Marks
0 0 2 2		Total :	50 Marks
		Duration of Exam:	2 Hours

Pre –Requisite: Basics of Mechanical Engineering

Successive: Thermodynamics, Mechanics of Solids, Manufacturing Process

Course Objectives:

To understand the basics of mechanical engineering and by working models and experiments.

Course Outcomes (COs): After studying this course the students will be able to:

CO 1- Understand the basics of working of boilers, mountings and accessories.

CO 2- Understand the principle and working of two strokes and four strokes internal combustion engines.

CO 3- Understand the mechanisms of simple lifting machines.

CO 4 - Understand the mechanism of gear drive.

CO 5- Understand the use of various measuring devices.

List of Experiments:

1. To study the construction and working of Cochran and Babcock & Wilcox boilers.
2. To study the function and working of various mountings and accessories in a boiler.
3. To study the construction and working of 2 stroke & 4 stroke diesel engine.
4. To study the construction and working of 2 stroke & 4 stroke petrol engine.
5. To calculate the mechanical advantage, velocity ratio and efficiency of worm and worm wheel.
6. To calculate the mechanical advantage, velocity ratio and efficiency winch crab.
7. To study Simple screw jacks and compound screw jacks and determine their efficiency.
8. Measurement of diameter of shaft using (i) vernier caliper (ii) digital caliper (iii) vernier micrometer (iv) digital micrometer.
9. Measurement of angle of taper using sine bar.
10. To study the different types of gears.

HAS-102C PHYSICS II

B. Tech II Semester

No. of Credits: 4		Sessional:	25 Marks
L T P Total		Theory:	75 Marks
4 0 0 4		Total :	100 Marks
		Duration of Exam:	3 Hours

Pre –Requisite: Physics I

Successive: Engineering Mechanics, Material Science, Micro and Nano Manufacturing

Course Objective:

This course introduces basic principles of crystal structure along with the defects. Emphasis is placed on the shortcoming of classical physics at the turn of the century leading to the discoveries of the modern era. The concepts of quantum mechanics and solid state serve as the foundation stone for the course. Extensions of these topics will include the modern view of the atom, wave particle duality of light, distribution of atoms, magnetism and conductivity. Through this course students will able to understand the basics of Nanotechnology and Superconductivity.

Course Outcome (COs): At the end of the course, the student shall be able to:

CO 1- Understand the basics of crystal structure and defects in solids. They would also be able to comprehend Quantum Physics and its relevance in the modern era.

CO 2- Learn the fundamentals of Free electron theory and have an elementary idea of Nanoscience and Nanotechnology.

CO 3- Understand Band theory of solids and Photoconductivity.

CO 4- Comprehend magnetic properties of solids and superconductivity and their applications in the contemporary world.

.***Syllabus:***

UNIT I **Crystal Structure:** Space lattice, unit cell and translation vector, Miller indices, inter-planar spacing, simple crystal structure (NaCl and Diamond), Bragg's law, Laue method, powder method, Point defects in solids – Schottky and Frenkel defects.

Quantum Physics: Difficulties with Classical physics, Introduction to quantum mechanics-simple concepts. Black Body radiation, Planck's radiation law, de-Broglie hypothesis, phase velocity and group velocity. Schrodinger wave equations-time dependent and time independent, Particle in a one-dimensional

box, Elementary idea of Quantum Statistics (Bose-Einstein and Fermi-Dirac Statistics), distribution function.

UNIT II **Nanomaterials and Applications:** Basic principle of Nanoscience and Nanotechnology, synthesis of nanoparticles, techniques- ball milling, sputtering, plasma synthesis, properties of nanoparticles-mechanical, optical, magnetic and electronic; introduction to carbon nanotubes.

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

UNIT III **Band Theory Of Solids:** Origin of energy bands, Kronig-Penny model (qualitative), E-K diagrams, Brillouin Zones, concept of effective mass and holes. Classification of solids into metals, semiconductors and insulators, Fermi energy and its variation with temperature, Hall Effect and its applications.

Photoconductivity & Photovoltaics: Photoconductivity in insulating crystal, variation with illumination, effect of traps, application of photoconductivity, photovoltaic cells, solar cell and its characteristics.

UNIT IV **Magnetic Properties of Solids:** Atomic magnetic moments, orbital diamagnetism, classical theory of paramagnetism, ferromagnetism- molecular fields and domains.

Superconductivity: Introduction (Experimental survey), Meissner effect, London equations, Hard and Soft superconductors, Elements of BCS Theory, Applications of superconductors

Text Books:

1. Perspectives of Modern Physics - Arthur Beiser (TMH)
2. Optics – Ajoy Ghatak (TMH)
3. Modern Physics for Engineers – S.P.Taneja (R. Chand)
4. Engineering Physics – Satya Prakash (Pragati Prakashan)
5. Modern Engineering Physics – A.S.Vasudeva (S. Chand)
6. Engineering Physics (Vol-2)- S.L. Gupta (Dhanpat Rai)

HAS-104C MATHEMATICS II

B. Tech II Semester

No. of Credits: 4		Sessional:	25 Marks
L T P Total		Theory:	75 Marks
4 0 0 4		Total :	100 Marks
		Duration of Exam:	3 Hours

Pre –Requisite: Mathematics I

Successive: Numerical Methods, Operations Research

Course Objective:

This course will give detailed view of exact differential equations, concept of obtaining suitable integrating factor, solution of ordinary differential equations with constant coefficients and variable coefficients. Application, Laplace transforms, Inverse Laplace transforms, solution of differential equations using laplace transforms, Partial Differential Equations, Lagrange's method, Charpit's method and Solution of homogeneous partial differential equations and application of partial differential equations to heat and wave equations, about infinite series, tests for checking convergence and divergence of infinite series. Checking the absolute convergence of alternating series.

Course Outcome (COs): At the end of the course, the student shall be able to:

CO 1- Acquire knowledge about many kinds of differential equations, different methods to find the solution of differential equations and applications of differential equations to solve boundary value problems and simultaneous equations.

CO 2- Acquire knowledge about Laplace transform, Inverse Laplace transform and its applications.

CO 3- Acquire knowledge about formation of partial differential equation, method to solve linear and non linear partial differential equation and method of separation of variable to solve heat and wave equation.

CO 4- Infinite series and different tests to check the convergence and divergence of Infinite series.

.***Syllabus:***

UNIT I **Ordinary Differential Equation and its Applications:** Exact differential equation of first order, Equations reducible to exact differential equation, differential equation of second and higher order, Complete solutions of linear differential equations(Complementary Function + Particular Integral), Method of variation of parameter to find Particular Integral, Cauchy's and Legendre's linear Equation,

Simultaneous linear equations with constant co-efficient, Application of linear differential equations to Electric circuits(LC,LCR circuit), Newton's law of cooling, Heat flow, Orthogonal trajectory.

UNIT II **Laplace-Transforms and its Applications:** Laplace-transforms of elementary functions, Elementary properties of Laplace-transforms, Existence conditions, Transforms of derivatives, Transforms of Integrals, Multiplications by t^n, division by t, Evaluation of integrals by Laplace –transforms, Second shifting Theorem , Inverse transforms, Convolution theorem, Applications to linear differential equations to solve boundary value problems with constants coefficients and simultaneous linear differential equations with constant coefficients.

UNIT III **Partial Differential Equation and its Application:** Formation of partial-differential equations. Lagrange's linear partial –differential equations. First order non-linear partial differential equations, Charpit's method. Homogeneous Partial-differential equation of second and higher order, Method of Separation of Variables and its applications to wave equation and one dimensional Heat equation.

UNIT IV **Infinite Series:** Convergence and divergence of Infinite series, Comparison Test, D'Alembert's Ratio Test, Gauss Test, Integral Test, Raabe's Test, Logarithmic Test, Cauchy's Root Test, Alternating Series, Conditional Convergence & Absolute Convergence.

Text/ Reference Books:

1. B.S. Grewal – Engineering Mathematics
2. Advanced Engineering Mathematics, Erwin Kreyzig
3. Advanced Engineering Mathematics, Dr. Babu Ram, Pearsons Publications.
4. Engineering Mathematics Seventh Edition by John Bird ,Published by Newnes.
5. Advanced Engineering Mathematics, K.A. Stroud, Dexter Booth, Published by Palgrave.

HAS-109C INTERACTIVE ENGLISH

B. Tech I/ II Semester

No. of Credits: 3		Sessional:	25 Marks
L T P Total		Theory:	75 Marks
3 0 0 3		Total :	100 Marks
		Duration of Exam:	3 Hours

Pre –Requisite: None

Successive: None

Course Objective:

To read and discuss text of a chosen Shakespearean tragedy and make students familiar with Romantic poetry in English literature so as to help the students enhance their understanding of value of literature in wider socio-historical context by evoking examples from Elizabethan England, the French revolution and Industrial revolution. Thereby to furnish examples from the literary canon to be first emulated and later critiqued in creative and critical writing. At the same time, to hone the skills of students in written communication by working on the vocabulary of students so they can express themselves clearly and persuasively.

Course Outcome (COs): At the end of the course, the student shall be able to:

CO 1- Students are conversant with representative texts of Shakespeare and Romantic poetry. They also understand the historical context of these literary works.

CO 2- Students are able to communicate effectively in corporate environment.

CO 3- Inculcate critical thinking and demonstrate an ability to articulate their thoughts coherently and creatively.

CO 4- Command a better vocabulary and express their thoughts clearly and precisely.

.***Syllabus:***

UNIT I **Literature:** Shakespeare's Macbeth(story adaptation of play); Romantic poetry- 'The Chimney Sweeper' by Blake, 'To Autumn' by John Keats, 'The Rainbow' by William Wordsworth, 'Ozymandias' by PB Shelley, 'The Rime of the Ancient Mariner' (text of 1834) –Part-I and Part-II by Samuel Coleridge, Historical context of Romantic poetry-French Revolution and Industrial revolution.

UNIT II **Functional English:** Report Writing- hypothesis-evidence-thesis, Proposals/Feasibility and Progress Reports/Memo/Letter formats; Essays/paragraphs; applications; description of objects, appliances, instruments, products, processes.

UNIT III **Critical thinking and Creative Writing:** Critical thinking; creative writing exercises; Seven Cs of writing/ Story composition/news reports/ feature writing/verse composition, Paraphrasing poems, comprehending Unseen Passages, writing biographies, art of interviewing, book reviews.

UNIT IV **Semantics and Syntax:** Antonyms, synonyms, homophones, words often confused, one word substitutes, word origins, sentence correction/error correction exercises in basic grammar.

References:

1. Shakespeare Readers. VolumeI. *Macbeth.* Scholastic India, 2016.
2. Michael Neill, David Schalkwyk. *The Oxford Handbook of Shakespearean Tragedy*. Oxford UP. 2016
3. Claire McEachern.*The Cambridge Companion to Shakespearean Tragedy.* Cambridge UP. 2013
4. RC Sharma and Krishna Mohan. 4th edition. *Business Correspondence and Report Writing*. McGraw Hill.
5. Bretag, Crossman, and Bordia. *Communictaion Skills.* TatMcGraw Hill.2012
6. A.C. Bradley and John Bayley. *Shakespearean Tragedy*. Penguin Books.1991

Other background readings:

1. Das, Manoj *Tales Told by Mystics*. Sahitya Akademi. New Delhi 2001
2. Usha Bande. Pointed Vision: An Anthology of Short Stories. Oxford UP. 2002
3. Reference material consisting of poems and material related to Romantic poetry to be circulated by the teacher consisting of introductory notes on French revolution and industrial revolution.

EE-101C BASIC ELECTRICAL ENGINEERING

B. Tech I / II Semester

No. of Credits: 3		Sessional:	25 Marks
L T P Total		Theory:	75 Marks
3 0 0 3		Total :	100 Marks
		Duration of Exam:	3 Hours

Pre –Requisite: None

Successive: Power Plant Engineering

Course Objectives:

The objective of this Course is to provide the students with an introductory and broad treatment of the field of *Electrical Engineering.*

.**Course Outcome (COs):** At the end of the course, the student shall be able to:

- **CO 1-** Analyze and solve the problems of DC Circuits and Network theorems
- **CO 2-** Solve problems related to AC circuits and Magnetic circuits
- **CO 3-** Examine the behaviour of poly phase system and power measurement
- **CO 4-** Understand the working principle, construction and applications of AC & DC machines

Syllabus:

UNIT I **DC Circuits:** Ohm's Law and Kirchhoff‟s Laws; Analysis of series, parallel and series-parallel circuits excited by independent voltage sources; Power and energy; *Electromagnetism*:- Faradays Laws, Lenz's Law, Fleming's Rules, Statically and dynamically induced EMF; Concepts of self inductance, mutual inductance and coefficient of coupling; Energy stored in magnetic fields; Hysteresis and Eddy current losses.

UNIT II **Network Theorems:** Superposition, Thevenin's and Norton's, Reciprocity, Compensation, Maximum Power transfer, Tellegan's and Millman's theorems, Application of theorems to dc and ac circuits.

UNIT III **AC Circuits:** *Single Phase A.C. Circuits :-*Generation of sinusoidal voltage-definition of average value, root mean square value, form factor and peak factor of sinusoidal voltage and current and phasor representation of alternating quantities; Analysis with phasor diagrams of R, L, C, RL, RC and RLC circuits; Real power, reactive power, apparent power and power factor, series, parallel and series- parallel circuits, Series and Parallel resonance, selectivity, bandwidth and Q factor, earthing

Three Phase A.C. Circuits:- Necessity and Advantages of three phase systems, Generation of three phase power, definition of Phase sequence, balanced supply and balanced load; Relationship between line and phase values of balanced star and delta connections; Power in balanced three phase circuits, measurement of power by two wattmeter method.

UNIT IV **Electrical Machines:**

Transformers: - Principle of operation and construction of single phase transformers (core and shell types). EMF equation, losses, efficiency and voltage regulation, Principle of operation of an Auto Transformer. Applications.

Synchronous Generators: - Principle of operation and constructional features, Applications

DC Machines:- Principle of Operation and constructional features, Classification and Applications.

Three Phase Induction Motor:- Principle of Rotating Magnetic Field, Principle of Operation of 3-Phase Induction Motor, Starting Methods and Applications of Three Phase Induction Motors.

Text Books:

1. Edward Hughes, Electrical Technology,10th Edition,ELBS 2010
2. Electrical Engg. Fundamentals. By V. Del Toro Prentice Hall
3. Electrical Technology, By H. Cotton, 7th Edition
4. Basic Electrical Engineering by Kothari & Nagrath TMH

CE-101C FUNDAMENTALS OF COMPUTER AND PROGRAMMING WITH C

B.Tech I/II Semester

No. of Credits: 3
L T P Total
3 0 0 3

Sessional: 25 Marks
Theory: 75 Marks
Total: 100 Marks
Duration of Exam: 3 Hours

Pre-Requisite: None

Successive: Kinematics of Machines and Operations Research

NOTE: Question paper has two parts. Part-1 has 10 questions each of 2 marks. It covers the entire syllabus. Attempt any four questions out of six from Part-2.

Course Objectives:

1. To understand the major components of computer system, programming languages and networking concepts.
2. To understand the basic building blocks of C language like variables, data types, managing I/O etc.
3. To understand the different statements like sequential, decision making, iterative such as if-else, loops and derived data types like arrays, structures etc.
4. To learn about the concept of Pointers and understand functions and file handling.

Course Outcomes (COs): After the successful completion of the course, student is able to:

CO 1- Learn the major components of computer system, programming language and Networking.

CO 2- Understand the building blocks of C language like variables, data types, managing I/O etc.

CO 3- Understand the different statements like sequential, decision making, iterative such as if-else, loops and derived data types like arrays and structures.

CO 4- Learn about the concept of Pointers and understand functions and file handling.

Syllabus:

UNIT I **An Overview of Computer System and Operating Systems:** Fundamentals: Hardware organization of a computer, CPU, Input/ Output Devices, Memories, Registers, Ports.

Different Number Systems:- Decimal Number System, Binary Number System, Octal Number System, Hexadecimal Number System, and their inter-conversions.

Operating System Basics: Introduction to Operating system, Functions of an Operating Systems, Classification of Operating Systems.

UNIT II **Basic Introduction to Programming Languages:** Machine Language, Assembly Languages, High level Languages, Types of high level languages, Complier, Interpreter, Assembler, Loader, Linker, Relationship between Compiler, Loader and Linker. Flowcharts.

UNIT III **Basic Introduction to Computer Networks:** LAN, MAN, WAN, OSI Reference model, Introduction to Internet and protocols: TCP/IP ref. model, Network connecting devices. Hypertext documents, HTTP, DNS, Network Security.

UNIT IV **An Overview of C:** Basic and Derived Data Types: Constants, Variables and Data types, operators and Expressions, managing I/O operations, Decision Making, branching and looping, Derived Data Types like Arrays, Strings.

Structure and Union in C: Defining structure, declaring variables, Accessing structure members, structure initialization, copying and comparing structures variables, operations on individual members, Array of structure, structure with structure, unions.

UNIT V **Pointers in C:** Introduction, Understanding Pointers, Accessing the address of a variable, Declaring Pointer Variables, Initialization of Pointer Variables, Pointer Expressions, Pointer Increments and Scale Factors, pointers and Arrays, Pointer and Character Strings, Pointers as Function Arguments, Pointers to Functions.

UNIT VI **File Management in C:** Defining and opening file, closing file, I/O operation on files, error handling during I/O operations.

Text Books:

1. Fundamental of Information Technology by A.Leon & M.Leon.
2. Let Us C by Yashwant Kanetkar.
3. Computer Fundamentals and Programming in C by A. K. Sharma, Universities Press.

Reference Books:

1. Programming in C by Schaum Series.
2. Computer Networks (4th Edition) by Andrew S. Tanenbaum
3. Digital Principles and Application by Donald Peach, Albert Paul Malvino
4. Operating System Concepts, (6th Edition) by Abraham Silberschatz, Peter Baer Galvin, Greg Gagne.

ME-152C PHYSICS LAB II
B. Tech II Semester

No. of Credits: 1		Sessional:	15 Marks
L T P Total		Practical:	35 Marks
0 0 2 2		Total :	50 Marks
		Duration of Exam:	2 Hours

Pre –Requisite: Physics I

Successive: None

Course Objectives:

To develop the domain knowledge in the fields of physics and to extend knowledge and processes used by physics have produced new and exciting technologies that are in everyday use.

Course Outcomes (COs): After studying this course the students will be able to:

CO 1- To demonstrate competency and understanding of the basic concepts found in core physics courses mechanics, quantum mechanics, magnetic properties, photoconductivity and modern physics.

CO 2- To utilize the scientific method for formal investigation and to demonstrate competency with experimental methods that are used to discover and verify the concepts related to content knowledge.

List of Experiments:

1. To find the low resistance by carey - Foster's bridge.
2. To find the resistance of a galvanometer by Thomson’s constant diffelction method using a post office box.
3. To find the value of high resistances by Substitution method.
4. To find the value of high resistances by Leakage method.
5. To study the characteristics of a solar cell and to find the fill factor.
6. To find the value of e/m for electrons by Helical method.
7. To find the ionisation potential of Argon/Mercury using a thyratron tube.
8. To study the variation of magnetic field with distance and to find the radius of coil by Stewart and Gee's apparatus.
9. To study the characteristics of (Cu-Fe, Cu-Constantan) thermo couple.
10. To find the value of Planck's constant by using a photo electric cell.
11. To find the value of co-efficient of self-inductance by using a Rayleigh bridge.
12. To find the value of Hall Co-efficient of semi-conductor.

13. To study the V-I characteristics of a p-n diode.
14. To find the band gap of intrinsic semi-conductor using four probe method.
15. To calculate the hysteresis loss by tracing a B-H curve.

Text/ Reference Books:

1. Advanced Practical Physics – B.L. Worshnop and H.T. Flint (KPH)
2. Practical Physics – S.L.Gupta &V. Kumar (Pragati Prakashan)
3. Advanced Practical Physics Vol. I& II – Chauhan & Singh (Pragati Prakashan)

CE-151C FUNDAMENTALS OF COMPUTER AND PROGRAMMING WITH C LAB

B. Tech I/II Semester

No. of Credits: 1		Sessional:	15 Marks
L T P Total		Practical:	35 Marks
0 0 2 2		Total :	50 Marks
		Duration of Exam:	2 Hours

Pre –Requisite: FOCP

Successive: KOM, OR

Course Objectives:

1. To understand the basic building blocks of C language like variables, data types, managing I/O etc.
2. To understand the different statements like sequential, decision making, iterative such as if-else, loops and derived data types like arrays, structures etc.
3. To learn about the concept of Pointers and understand functions and file handling.

Course Outcomes (COs): After studying this course the students will be able to:

CO 1- Implement the different statements like sequential, decision making, iterative such as if-else, loops and derived data types like arrays and structures.

CO 2- Implement the concept of Pointers and understand functions, file handling.

List of Experiments:

1. Write a Program to calculate sum of two numbers
2. Write a Program to calculate Simple Interest.
3. Write a Program to find larger among two numbers
4. Write a Program to find largest among three numbers
5. Write a Program to calculate roots of a quadratic equation
6. Write a Program to print 1 to 10 using loop
7. Write a Program to print even numbers from 2 to 100
8. Write a Program to print sum of digits of a number
9. Write a Program to print the reverse of a number entered by user

10. Write a Program to print table of a number
11. Write a Program to print the Fibonacci series
12. Write a Program to calculate factorial of a number
13. Write a Program to find a^b
14. Write a Program to check if number is Prime
15. Write a Print first n terms of Fibonacci Series
16. Write a Program to find largest and smallest element in an array
17. Write a Program to find sum of two 2-D arrays
18. Write a Program to multiply two 2-D arrays
19. Write a Program to use inbuilt string functions.
20. Write a Program to check whether entered string is palindrome
21. Write a Program to calculate factorial of a number using functions
22. Write a Program to find factorial using recursion
23. Write a Program to find length of a string using pointers
24. Write a Program to calculate marks using array of structures.
25. Write a Program to copy the contents of one file to another file

Reference Books:

1. Let Us C by Yashwant Kanetkar
2. Fundamentals of Computers and Programming with C by A. K. Sharma Dhanpat Rai publications
3. Test your C Skills by Yashwant Kanetkar

EE-151C BASIC ELECTRICAL ENGINEERING LAB

B. Tech I/II Semester

No. of Credits: 1		Sessional:	15 Marks
L T P Total		Practical:	35 Marks
0 0 2 2		Total :	50 Marks
		Duration of Exam:	2 Hours

Pre –Requisite: Basic Electrical Engineering

Successive: Nil

List of Experiments:

1. To verify KCL and KVL.
2. To verify Thevenin's & Norton's theorems.
3. To verify maximum power transfer theorem.
4. To verify Superposition theorems.
5. To study frequency response of a series R-L-C circuit and determine resonant frequency & Q- factor for various Values of R, L, C.
6. To study frequency response of a parallel R-L-C circuit and determine resonant frequency & Q -Factor for various values of R, L, C.
7. To find inductance of coil without core and with iron core.
8. To perform polarity test on single phase transformer.
9. To perform O.C. and S.C. test on single phase transformer.
10. To study various type of electrical instruments
11. To measurement of power and power factor in a three phase system by two wattmeter method.

HAS-159C LANGUAGE LAB
B. Tech I/II Semester

No. of Credits: 1		Sessional:	15 Marks
L T P Total		Practical:	35 Marks
0 0 2 2		Total :	50 Marks
		Duration of Exam:	2 Hours

Pre –Requisite: Interactive English

Successive: None

Course Objectives:

To guide the students to improve their conversational and linguistic skills including better command over spoken English. Introduce students to various scenarios to help them opt for appropriate responses on interpersonal level.

Course Outcomes (COs): The students will be trained to respond better to new scenarios that demand good communication skills.

1. The students will be able to resolve potential conflicts by avoiding communication gaps and overcoming barriers.
2. Students will learn to use skills effectively for enhancing performance and even improving upon their power to persuade.

Corporate Interaction & Communication

1. Presentations
2. Listening Skills & Language Lab (Practical) Interviews of Isaac Asimov, Richard Feynman, Steve Jobs and other scientists and technocrats. Other inspiring speeches on social issues as well as related to the corporate world and industry; Audio/Video Lessons and Observation
3. Group Discussions, Corporate Dialogue: Conflict-Resolution exercises; Role Play; Mock-interviews.
4. Internal Assessment: based on participation, short presentation & performance in interactive exercises: competence gauged through participation in various events organized in the classroom and at university level throughout the semester.

***Recommended*:**

1. Language Lab Software

ME-152C ENGINEERING DRAWING

B. Tech I/II Semester

No. of Credits: 2

L	T	P	Total
0	0	4	4

Sessional: 30 Marks
Practical: 70 Marks
Total : 100 Marks
Duration of Exam: 3 Hours

Pre-Requisite: None

Successive: Machine Drawing, Computer Aided Design

Course Objectives:

To understand the basic principles of engineering drawing and graphics and to apply the same to draw different types of projections.

Course Outcomes (COs): At the end of the course, the student shall be able to:

CO 1- Understand the basic principles of projections of points and lines.

CO 2- Understand the different orientations and projections of planes.

CO 3 - Understand projections and sectioning of solids in different orientations.

CO 4- Grasp the concepts of development of surfaces.

CO 5- Understand and draw orthographic and isometric view of an object.

Syllabus:

UNIT I **Introduction and Projections of Points:** Importance and scope of Engineering Drawing, Instruments, Lettering, Types of lines, Dimensioning, Different methods of projections, B.I.S Specifications, Introduction to AutoCAD.

Introduction to plane of projection, reference & auxiliary planes, projection of points in different quadrants.

UNIT II **Projection of Lines:** Projection of lines parallel to reference planes, perpendicular to reference planes, inclined to one reference plane and parallel to the other, inclined to both the reference planes, traces, true inclinations & true lengths of the lines.

UNIT III **Projection of Planes:** Parallel to one reference plane, inclined to one plane but perpendicular to the other, inclined to both reference planes.

UNIT IV **Projections and Sectioning of Solids :** Projection of Polyhedra, solids of revolution-in simple positions with axis perpendicular to a plane, with axis parallel to both planes, with axis parallel to one plane and inclined to the other.

Projection of section of prisms, pyramids, cylinders and cones with axis perpendicular to one reference plane and parallel to the other reference plane.

UNIT V **Development of Surfaces:** Development of simple object with and without sectioning.

UNIT VI **Orthographic and Isometric Projections:** Orthographic projections of simple machines components and Nuts, Bolted Joints, Screw threads.

Introduction to isometric projections, Isometric scale, Isometric projections/ views of plane figures like prisms, pyramids, cylinders and cones.

Text Books:

1. Machine Drawing - N D Bhatt and V M Panchal, Charotar Publishing House.
2. A Text Book of Machine Drawing - P S Gill Pub.: S K Kataria & Sons.
3. Engineering Graphics with Auto CAD 2002 - James D.Bethune, Pearson Education.
4. A Text Book of Machine Drawing by Laxmi Narayana and Mathur, M/s. Jain Brothers, New Delhi.
5. Machine Drawing by N Sidheshwar, Kannaieh, V S Sastry, TMH., New Delhi.
6. Fundamentals of Engineering Drawing by Luzaddder: PHI.
7. Fundamentals of Engineering Drawing by French and Vierk; Mc Graw Hill.

WS- 161C/ WS- 162C **WORK SHOP-1/II**

B. Tech I/ II- Semester

No. of Credits: 3	Internal: 30 Marks
L T P Total	External: 70 Marks
0 0 6 6	Total : 100 Marks
	Duration of Exam: 3 Hours

MECHANICAL WORKSHOP (Group –I)

Course Outcomes (COs): After studying this course the students would:

CO 1- Have exposure to mechanical workshop layout and safety aspects.

CO 2- Understand the functions of various machines and cutting tools used in machine shop.

CO 3- Practice real time job preparation using various operations related to machine shop such as filing, drilling, milling & turning.

CO 4 - Practice job preparation in welding shop.

CO 5 - Learn to use different measuring tools like vernier caliper, vernier height gauge and micrometer.

CO 6 - Practice job preparation in sheet metal shop.

List of Exercises:

Fitting, sheet metal and welding workshop:

1. To study layout, safety measures and different engineering materials (mild steel, medium carbon steel, high carbon steel, high speed steel and cast iron etc) used in workshop.
2. To study and use of different types of tools, equipments, devices & machines used in fitting, sheet metal and welding section.
3. To determine the least count of vernier calliper, vernier height gauge, micrometer and take different reading over given metallic pieces using these instruments.
4. To study and demonstrate the parts, specifications & operations performed on lathe machine.
5. To study and demonstrate the parts, specifications & operations performed on milling machine.
6. To study and demonstrate the parts, specifications & operations performed on shaper machine.
7. To prepare a job involving different type of filing practice exercise in specified dimensions.
8. To prepare a job involving multi operational exercise (drilling, counter sinking, tapping, reaming, hack sawing etc.)
9. To prepare a multi operational sheet metal job (self secured single groove joint/ hasp & stay etc.).
10. To practice striking an arc, straight short bead, straight continuous bead and re-start of electrode in flat position by arc welding on given M.S. plate as per size.
11. To practice tack weld of two close plate in flat position by arc welding on given M.S. plate as per size.
12. To practice close butt joint in flat position by arc welding on given M.S. plate as per size.

NOTE: - At least nine exercises should be performed from the above list; remaining three may either be performed from above list or designed by the concerned institution as per the scope of the syllabus and facilities available in institute.

WS- 161C/ WS- 162C **Workshop- I/II**

No. of Credits: 3

L T P Total **Internal: 30 Marks**
0 0 6 6 **External: 70 Marks**
Total: 100 Marks
Duration of Exam: 3 Hours

(Group –II)
PART-A
Computer Engineering Workshop

Course Outcomes (COs):

After the completion of the course the student will be able to:

CO1- Acquire skills in basic engineering practice.
CO2- Have working knowledge of various equipments used in workshop.
CO3- Have hands on experience about various machines and their components.
CO4- Obtain practical skills of basic operation and working of tools used in the workshop.

1. To study and demonstrate Block diagram of Digital Computer System and brief explanation of each unit.
2. To demonstrate History/ Generation/ classifications and different types of Personnel Computer.
3. To study and demonstrate internal parts of a Computer System (Card level) and other peripheral devices and explanation of POST & BIOS.
4. To study and demonstrate primary memory and secondary memory.
5. To demonstrate CPU Block diagram and other Peripheral chips, Mother Board/ Main Board and its parts, Connectors, Add On Card Slots etc.
6. To study working of various types of monitors: CRT type, LCD type & LED type.
7. To study Keyboard and Mouse: Wired, Wireless, Scroll & Optical with detail working.
8. To study Printers: Dot Matrix Printers, Daisy wheel Printers, Ink-Jet Printers and Laser Jet Printers with detailed working explanation.
9. Assembly / Installation and Maintenance of Personnel Computer Systems: Practical exercise on assembly of Personnel Computer System, Installation of Operating System: Windows & Linux etc, Installation of other Application Softwares and Utility Softwares, Fault finding in Personnel Computers: Software or Hardware wise, Virus: Introduction, its Types & Removal techniques, Data Backup and Restore, Data Recovery Concepts, Typical causes of Data loss.

10. To demonstrate networking concepts: Introduction of Connecting devices: Hub, Switch & Router etc, Networking Cable preparation: Normal & Cross Cables, Data Transferring Techniques from one Computer System to another Computer System, Configuration of Switch/ Routers etc.

PART-B
Electrical Workshop

1. Introduction of Electrical Safety precautions, Electrical Symbols, Electrical Materials, abbreviations commonly used in Electrical Engg. and familiarization with tools used in Electrical Works.
2. To make a Straight Joint & Tee joint on 7/22 PVC wire and Britannia Joint on GI wire.
3. To study fluorescent Tube Light, Sodium Lamp and High Pressure Mercury Vapour Lamp.
4. To study different types of earthing and protection devices e.g. MCBs, ELCBs and fuses.
5. To study different types of domestic and industrial wiring and wire up a circuit used for Stair case and Godown wiring.
6. To make the connection of fan regulator with lamp to study the effect of increasing and decreasing resistance in steps on the lamp.
7. To fabricate half wave and full wave rectifiers with filters on PCB.
8. Maintenance and Repair of Electrical equipment i,e Electric Iron , Electric Toaster , Water heater, Air coolers and Electric Fans etc.
9. To study soldering process with simple soldering exercises.
10. To make the connection of a three core cable to three pin power plug and connect the other cable end by secured eyes connection using 23/0.0076”or 40/0.0076” cable.

PART- C
Electronics Workshop

1. To study and demonstrate basic electronic components, Diode, Transistor, Resistance, Inductor and capacitor.
2. To study and demonstrate resistance color coding, measurement using color code and multimeter and error calculation considering tolerance of resistance.
3. To study and demonstrate Multimeter and CRO- front panel controls, description of block diagram of CRT and block diagram of CRO.

4. To study and demonstrate Vp(peak voltage),Vpp(peak to peak voltage), Time, frequency and phase using CRO.
5. Introduction to function generator. Functions of front panel controls and measurement of different functions on CRO.
6. To study and demonstrate variable DC regulated power supply, function of controls and DC measurement using multimeter and CRO.
7. Soldering practice on wire mesh or a resistance decade board includes fabrication, soldering, lacing, harnessing forming and observation.
8. Testing of components using multimeter and CRO like diode, transistor, resistance capacitor, Zener diode and LED.
9. To study and demonstrate rectification, half wave, Full wave and bridge rectifier. Fabrication, assembly and waveform observation.
10. To design and fabricate a printed circuit board of a Zener regulated/ series regulated power supply and various measurements, testing of power supply.

Note: At least 8 exercises are to be performed from each part by the students.