University Institute of Information Technology

H.P. University Summerhill, Shimla-171005

(NAAC Accredited **A-Grade** University)

Syllabus

First Year (Semester-I & Semester-II)

of

Four (04) years

Bachelor of Technology (B. Tech.) Programme

In

Electronics and Communication Engineering (ECE)

Effective from 01st August, 2019

Scheme of the Syllabus
B. Tech. I-year (Electronics & Communication Engineering)
First Semester

Sr. No	Course Code	Course Title	L	T	P	Contact Hours	Credits	Semester End Marks	
								External Exam	Internal Assessment
1.	AS-1001	Applied Mathematics-I	3	1	0	4	**4**	100	50
2.	AS-1002	Applied Physics	3	1	0	4	**4**	100	50
3.	EC-1001	Basic Electronics	3	1	0	4	**4**	100	50
4.	IT-1001	Fundamentals of Computers	3	1	0	4	**4**	100	50
5.	AS-1003	Applied Physics Lab	0	0	2	2	**1**	50	50
6.	ME-1001	Engineering Graphics & Design Lab	0	0	4	4	**2**	100	50
7.	EC-1002	Basic Electronics Lab	0	0	2	2	**1**	50	50
TOTAL						**24**	**20**	**600**	**350**
								Total = 950	

Second Semester

Sr. No.	Course Code	Course Title	L	T	P	Contact Hours	Credits	Semester End Marks	
								External Exam	Internal Assessment
1.	AS-2001	Applied Mathematics-II	3	1	0	4	**4**	100	50
2.	IT-2001	Introduction to C Language	3	1	0	4	**4**	100	50
3.	HU-2001	Communication & Professional Skill in	3	0	0	3	**3**	100	50
4.	EE-2001	Basic Electrical Engineering	3	1	0	4	**4**	100	50
5.	IT-2002	C Programming Lab	0	0	2	2	**1**	50	50
6.	EE-2002	Basic Electrical Lab	0	0	2	2	**1**	50	50
7.	EC-2001	Electronics & Communications Engineering Workshop	0	0	2	3	**2**	50	50
TOTAL						**22**	**19**	**550**	**350**
								Total Marks = 900	

L = Lectures
T = Tutorials
P = Practical

Semester - I

Name of the Course	**Applied Mathematics-I**		
Course Code	**AS-1001**	Credits-4	L-3, T-1, P-0
Lectures to be Delivered	**52 (1 Hr Each) (L=39, T=13 for each semester)**		
Semester End Examination	**Max Marks: 100**	**Min Pass Marks: 40**	Maximum Time: 3 hrs
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 and 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 and 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 question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

SECTION – A

Function of several variables, limits and continuity, partial derivatives, higher order partial derivatives, Euler's theorem, maxima of functions of two variables. Lagrange's method of multipliers, reduction formulae, beta and gamma functions.

SECTION – B

Linear differential equations of second order with constant coefficients: complementary functions, particular integrals, Euler homogeneous form, and variation of parameters. Convergence of Series, power series expansion of functions, Taylor's and Maclaurin's series.

SECTION – C

Matrices: Review of properties of determinants. Elementary operations on matrices. Homogeneous and non homogeneous system of linear equations and their properties. Eigen values of hermitian, skew-hermitian and unitary matrices.

SECTION – D

Complex analytic functions: Brief review of complex numbers, complex variable, concept of limit, continuity and derivatives of analytical function, Cauchy-Riemann equations, harmonic function, complex series, some elementary functions, logarithm.

Text Books:

1. Higher Engineering Mathematics : B.S. Grewal : Khanna Publishers
2. Engineering Mathematics (2nd edition) Vol-I and Vol-II : S.S.Shastri : Prentice Hall of India

Reference Books:

1. Advanced Engineering Mathematics : E. Kreyszig : John Wiley & Sons
2. Differential and Integral Calculus : N. Piskunov : CBS Publishers
3. Advanced Engineering, Mathematics : R.K.Jain & S. R. K Iyengar : Narosa Pub. House
4. Advanced Engineering Mathematics :Michael D. Greenberg : Pearson Education

Name of the Course	**Applied Physics**		
Course Code	**AS-1002**	**Credits-4**	L-3, T-1, P-0
Lectures to be Delivered	**52 (1 Hr Each) (L=39, T=13 for each semester)**		
Semester End Examination	**Max Marks: 100**	**Min Pass Marks: 40**	**Max. Time: 3 hrs**
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 and 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 and 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 question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

SECTION- A

Optics: Methods of interference-division of wave front, division of amplitude, interference through thin films, Newton rings. Diffraction of light, diffraction through single slit, double slit and diffraction grating.
Special theory of Relativity: Galilean transformations. Postulates of Einstein's special theory of relativity, Lorentz transformations. Length contraction, time dilation, Variation of mass with velocity, mass-energy equivalence.
Electromagnetic wave theory: Basic idea of vector calculus, gradient, curl and divergence. Maxwell's equations and their significance, Electromagnetic waves, Poynting vector, Electromagnetic wave equation.

SECTION- B

Quantum Mechanics: Introduction to quantum mechanics, concept of de Broglie Waves, Davisson-Germer experiment, wave packet, Phase and Group Velocities, wave function and its properties, operators in quantum mechanics, Expectation Values, Eigen Values and Eigen functions. Postulates of quantum mechanics, Time dependent and time independent Schrodinger wave equation, Application: Particle in a box, Tunnel Effect.

SECTION – C

Band Theory of Solids: Free electron theory: Quantum theory of free electrons, Fermi Dirac distribution function and its variation with temperature. Periodic potential and Bloch theorem, Kronig Penney Model (qualitative), E-K diagrams, Brillouin Zones, Classification into metals, semiconductors and insulators.
Superconductivity: Superconductivity, effect of magnetic field, Meissner effect, types of Superconductors, BCS theory (qualitative), Josephson effect, applications of superconductivity.

SECTION – D

Laser: Spontaneous and stimulated emission, Laser action schemes, Characteristics of Laser Beam, Ruby laser, He-Ne Laser, Semiconductor Laser (simple Ideas) with applications.

Fiber Optics: Optical Fibres, Numerical Aperture, single mode and multi mode Fibers, step index and graded index fiberes, optial fiber communications, losses in optical fibers.

Text Books:

1	Modern Engineering Physics	: A. S. Vasudeva	: S. Chand Pub
2	A text book of Engineering Physics	:M.B.Avadhanulu P.G.Kshirsagar	: S.Chand & Publications

Reference Books

1	Solid state Physics	: Gupta & Saxena	: Pragati Publications
2	Concepts of Modern Physics (5^{th} International edition)	: Arthur Beiser	: Tata McGraw Hill
3	Modern Engineering Physics	: Bhattacharya Tandon	: Oxford
4.	Modern Engineering Physics	: Sharma & Sharma	: Pearson

Name of the Course	**Basic Electronics**		
Course Code	**EC -1001**	Credits-4	L-3, T-1, P-0
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	**Max Marks: 100**	**Min Pass Marks: 40**	**Maximum Time: 3 hrs**
Continuous Assessment (based on sessional test (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 and 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 and 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 question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

SECTION –A

Brief review of Band Theory, transport phenomenon in semiconductors, Electrons and holes in Intrinsic semiconductor, Donor and acceptor Impurities, charge densities in semiconductor.

PN Junction, Reverse and Forward bias conditions, Diode Characteristic and parameter, Ideal vs. Practical diode.equivalent circuits and frequency response. rectification-half and full wave, Zener and Avalanche diode, its role as regulator, photodiode.

SECTION –B

Bipolar junction transistor (BJT) and their characteristics as circuit and gain elements.

Two port network analysis, h-parameters and trans-conductance. Equivalent circuits for JFET and MOSFET, enhancement mode and depletion mode MOSFETS.

Unijunction transistor (UJT), UJT characteristics, parameters and circuit operation.

SECTION –C

Bias for transistor amplifier: fixed bias, emitter feed back bias. Feedback principles. Types of feedback, Stabilization of gain, reduction of non-linear distortion, change of inputs and output resistance by negative feedback in amplifier. Amplifiers coupling, types of coupling, Amplifier pass band, Eq circuits for BJT at high frequency response of CE, RC-Coupled amplifiers at mid, low and high frequencies.

SECTION-D

Semiconductor processing, active and passive elements, Integrated circuits, bias for integrated circuits. Basic operational amplifier, applications of operational amplifier – adder, subtractor, Integrator, differentiator and comparator, Photo transistor: its characteristics and applications.

Reference Books:-

1	Electronic Principles	: A.P.Malvino	: TMH
2	Electronic Fundamentals and Applications	: J.D. Ryder	: PHI
3	Electronic Circuits & Devices	: J.Millman and C.C.Halkias	: TMH
4	Integrated Circuits & Devices	: J.Millman & C.C.Halkias	: TMH
5	Basic Electronic & Linear Circuits	: N.N.Bhargava & Kulshrestha	: TMH

Name of the Course	**Fundamentals of Computers**		
Course Code	***IT – 1001***	Credits : 4	L-3, T-1, P-0
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Exams.	***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

Computer Appreciation: Definition of an Electronic Digital Computer, history, Generations, Characteristics and applications of Computers, classification of Computers.
Information and Data Hardware: CPU, Primary and Secondary storage, I/O devices, Bus structure, Computer Peripherals - VDU, Keyboard, Mouse, Printer.
Software: System software, Application software, open source software.
Concept of Programming Languages: Machine Language, Assembly Language, High Level Language, Object Oriented Language, Introduction to 4GLS, linker, loader, assembler

SECTION – B

Number systems and Codes: Number representation: Weighted codes, Non-weighted codes, Positional, Binary, Octal, Hexadecimal, Binary Coded Decimal (BCD), Conversion of bases. Complement notations, Binary Codes: Gray, Alphanumeric, ASCII, EBCDIC
Basic Computer Organization: IAS Computer, Von Neumann Computer, System Bus. Instruction Cycle, Data Representation (bit, byte, word), CPU Organization, Arithmetic and Logic Unit, Control Unit, CPU Registers, Instruction Registers, Program Counter, Stack Pointer.

SECTION – C

Storage: memory hierarchy, caparison of memories on the basis of speed, capacity and cost
Operating system: evaluation of Operating system, definition and function: batch processing OS, multi programming and multi-tasking OS, time sharing OS, Real time OS, Spooling
Data communication and network : Data transmission modes : Simplex, half-duplex, full-duplex,
Data transmission speed: narrowband, voiceband, broadband.
Transmission media: Guided and unguided media, twisted wires, coaxial cable, optical fiber, microwave.
Switching techniques: Circuit switching, message switching, Packet switching

SECTION – D

Introduction to Networking: Basic Features, LAN, MAN and WAN; Mode of operation and characteristics. LAN Topologies, OSI model of networking, client – Server Architecture's.
Intranet and Internet: Servers and Clients; Ports; Domain Name Server (DNS); WWW, Browsers, Dial up, ISDN, ADSN; Cable, Modem; E-mail, Voice and Video Conferencing.
Latest Computer 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 e-Governance /IT Projects in India such as NICNET, ERNET, INFLIBNET etc.

Text Books

1. Computer Fundamentas : P. K. Sinha
2. Introduction to Computer : V. Rajaraman

Reference Books

1. Computer Organization : Morris Mano
2. Computer Organisation : Hamrache
3. Managing Information System : Kanter
4. Information Technology India Tomorrow : Vital N
5. Fundamentals & Information Technology : Murthy C.S.V

Name of the Course	Applied Physics Lab			
Course Code	**(AS-1003)**	Credits-1	L-0, T-0, P-2	
Lectures to be Delivered	26 hours of Lab. work (2 hrs. per week)			
Semester End Examination	Max Marks: 50	Min Pass Marks: 20	Maximum Time: 3 hrs	
Continuous Assessment	Lab work 30%, Lab Record 25%, Viva/ Hands on 25%, Attendance 20%		Max Marks: 50	Min Pass Marks: 25

Instructions for paper setter / candidates

Laboratory examination will consist of two parts:

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

(ii) Viva-voce examination based on practical performed during the semester (25 marks)

List of Experiments

Note: (Two experiments to be done from each section, total number of experiments required to be performed 10 to be decided by the teacher concerned and availability of equipment.)

SECTION- A

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 colors of white light using plane transmission diffraction grating.
4. To find the wavelength of sodium light by Michelson interferometer.

SECTION-B

1. To find the refractive index and Cauchy's constant of a prism by using spectrometer.
2. To find the resolving power of a telescope.
3. To study the beam parameters of a helium-neon laser.
4. To find the specific rotation of sugar solution by using a polarimeter.
5. To find the specific rotation of sugar using polarimeter

Electricity and Magnetism

SECTION-C

1. To find flashing & quenching potentials of argon & hence to find the capacitance of unknown capacitor.

SECTION- D

1. To find the low resistance by carrey – Foster's bridge.
2. To find the resistance of a galvanometer by Thomson's constant deflection method using a post office box.
3. To find the value of high resistance by Substitution method.
4. To convert a galvanometer into an ammeter of a given range.
5. To study the variation of magnetic field with distance for Stewart and Gee's apparatus.
6. To find the reduction factor of two turn coil tangent galvanometer using copper voltammeter.

Modern Physics:

SECTION-E

1. To find the value of e/m for electrons by Helical method.
2. To determine the charge of an electron by Millikan's oil drop method.
3. To find the value of Planck's constant by using a photoelectric cell.

SECTION-F

1. To calculate the hysteresis loss by tracing a B-H curve for a given sample.
2. To determine the band gap of an intrinsic semiconductor by four probe method.
3. To determine the resisitivity of a semi-conductor by four probe method at different temperatures.
4. To determine the Hall co-efficient.
5. To study the photovoltaic cell & hence to verify the inverse square law.

Books:

1	Practical Physics	: S.L.Gupta & V.Kumar	: PRAGATI
2	Practical Physics for B.Sc I, II and III	: S. L. Arora.	: S. Chand

Name of the Course	Engineering Graphics and Design Lab			
Course Code	**ME-1001**	Credits-2	L-0, T-0, P-2	
Lectures to be Delivered	**60 (L=16 P=44)**			
Semester End Examination	**Max Marks: 100**	**Min Pass Marks: 40**	**Maximum Time: 3 hrs**	
Continuous Assessment (based on sessional test (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			**Max Marks: 50**	**Min. Pass Marks: 40%**

INSTRUCTIONS

1. For Paper Setters: The question paper will consist of five sections A, B, C, D and 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 and 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 question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

3. This course will be conducted in drawing hall fitted with drawing tables and drafters.

SECTION-A

Drawing Techniques: Various type of lines, principal of dimensioning, size and location as per IS code of practice (SP-46) for general engg. Drawing. Practice of drawing, various types of lines and dimensioning exercises. Drawing exercises pertaining to symbols. Conventions and Exercise of lettering techniques. Free hand printing of letters and numerals in 3, 5, 8 and 12 mm sizes, vertical and inclined at 75 degree. Instrumental lettering in single stroke. Linear Scale, Diagonal scale & vernier scale.

Projection of Points, Lines and Planes: Concept of horizontal and vertical planes. First and third angle projections: projections of point and lines, true length of lines and their horizontal and vertical traces, projection of planes and their traces.

SECTION- B

Projections of Solids: Right regular solids of revolution and polyhedrons etc. and their auxiliary views.
Sectioning of Solids: Principal of sanctioning, types of sanctioning and their practice on projection of solids.

SECTION- C

Practice In: Orthographic projections of individual blocks/ parts
Isometric Projection: Concept of isometric views: isometric scale and exercise on isometric views.

SECTION-D

Development of Surfaces: Development of surfaces of cylinders, cones, pyramid, prism etc. exercises involving development of unique surfaces like Y-piece, hopper, tray, truncated pieces etc.
Intersection of Surfaces: Intersection of cylinders, cones and prisms with their axes being vertical, horizontal or inclines. Exercise on intersection of solids-cylinder and cylinder, cylinder and cone, prism and prism.

Text Books:

1	Elementary Engineering Drawing	: N.D. Bhatt	: Charotar Pub. House
2	Engineering Drawing & Engg. Graphics.,	: P.S.Gill	: S.K.Kataria & sons
3	Engineering Graphics	:L.V. Lakshminarayan & R.S. Vaish	
4	Engineering Drawing Plane and Solid Geometry, 44th Edition 2002	: N.D. Bhatt V.M. Panchal	: Charotar Pub. House

Reference Books

1	Engineering Graphics with AutoCAD 2002	: James D. Bethune	: Pearson Education
2	Engineering Graphics and Drawing	: P.S.Gill	: S.K.Kataria
3	Engineering Graphics using AUTOCAD 2000, 1st Edition 2002	: T. Jeyapoovan	:Vikas Publishing House.
4	Engineering Drawing and Graphics + AutoCAD 4th Edition	: K. Venugopal	:New Age International
5	Engg. Drawing	:Harwinder Singh	: Dhanpat Rai
6	Engg. Drawing	:R. K. Dhawan	:S. Chand

Name of the Course	Basic Electronics Lab			
Course Code	**EC-1002**	Credits-1	L-0, T-0, P-2	
Lectures to be Delivered	26 hours of Lab. work (2 hrs. per week)			
Semester End Examination	Max Marks: 50	Min Pass Marks: 20	Maximum Time: 3 hrs	
Laboratory Continuous Assessment	Lab work 30%, Lab Record 25% Viva/ Hands on 25%, Attendance 20%		Max Marks: 50	Min Pass Marks: 25

Instructions for paper setter / candidates

Laboratory examination will consist of two parts:

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

(ii) Viva-voce examination (25 marks)

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

List of Experiments:

(a) To study the use and scope of using an oscilloscope as a measuring device in an electronic laboratory.

(b) To study the use and scope of using a millimeter (digital and analog) as a measuring device in an electronics laboratory.

(c) To study the use and scope of function generator as a signal source in an electronics laboratory.

Set up an experiment to:

1. Draw forward bias and reverse bias characteristics of a p-n junction diode and use it as a half wave and full wave rectifier.
2. Draw the characteristics of a zener diode and use it as a voltage regulator.
3. Draw characteristics of common base configuration of p-n-p transistor.
4. Draw characteristics of common emitter configuration of an npn transistor.
5. Draw characteristics of common drain configuration of a MOSFET.
6. Find the voltage and current gain of single stage common emitter amplifier.
7. Draw the characteristics curve of UJT.
8. Find the voltage gain of single stage voltage series feedback amplifier.
9. Use operational amplifier as

I) Inverting amplifier
II) Non-inverting amplifier
III) Comparator
IV) Integrator
V) Differentiator
VI) Adder
VII) Precision amplifier

10. Find the overall voltage gain and current gain of a two stage RC coupled amplifier.

Basic electronics should stress on interfacing with real life devices and general-purpose linear units. Emphasis is on system design and not on discrete components, some of the components around which exercises can be built are

1. SCR as triacs and power control.
2. Power supplies starting with zener.
3. Op to compliers and isolations where photo diode, transistors, leds are used.
4. Laser diode (laser pointer)
5. Op amps
6. Op amps for instrument amplifiers.

Note: - Record to be maintained in the laboratory record book for evaluation. Usage of breadboard approach to be encouraged.

Reference Books :

1. Basic Electronic & Linear Circuits : N.N.Bhargava & Kulshrestha : TMH
2. Electronic Devices & Circuit Theory : Robert L.Boylestad Louis Nashelsky : Pearson Edu.

Semester - II

Name of the Course	**Applied Mathematics – II**		
Course Code	***AS – 2001***	Credits : 4	L-3, T-1, P-0
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: Tangent, curvature and torsion, Directional derivative, Gradient of a scalar field, divergence and curl of a vector field. Line, surface and volume integrals, theorem of gauss and Stoke's (proofs not needed).

SECTION – B

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

Reference Books:

1	Advanced Engineering Mathematics	:E. Kreyszig	:John Wiley & Sons (Asia) Pvt. Ltd.
2	Engineering Mathematics (2^{nd} edition) Vol-I and Vol-II	:S.S.Shastri	: Prentice Hall of India Pvt. Ltd.
3	Higher Engineering Mathematics	:B.S. Grewal	:Khanna Publishers
4	Differential and Integral Calculus	:N Piskunov	:CBS Publishers and Distributors.
5	Advanced Engineering, Mathematics	:R.K.Jain and. S.R. K Iyengar	:Narosa Publishing House
6	Advanced Engineering Mathematics	:Michael D Greenberg	:Pearson Education Asia

Name of the Course	**Introduction to C Language**		
Course Code	**IT-2001**	Credits-4	L-3, T-1, P-0
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	**Max Marks: 100**	**Min Pass Marks: 40**	**Maximum Time: 3 hrs**
Continuous Assessment (based on sessional test (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

Problem solving with Computers: Algorithms, pseudo codes and Flowcharts.
Overview of C Programming: Structure of C program, character set, keywords & identifiers, Data types, Constants, variables, expressions (arithmetic and logical), typedef, enum
Operators: Arithmetic, relational, logical, bitwise, conditional and modulus operator, operator's precedence & associativity, preprocessors statements, data inputs and output functions, assignments statements.

Section B

Conditional statements: If-else, nested if-else, switch-case statement
Control statements: for loop, while loop, do-while, nested loops, jump control statements: break, continue, goto, exit, return.
Functions: Declaration of functions, definition of functions, calling of functions, call by value and call by reference

Section C

Arrays: One dimensional arrays,–Declaration of 1D arrays –Initialization of 1D arrays –Accessing element of 1D arrays –Reading and displaying elements –Two dimensional arrays –Declaration of 2D arrays –Initialization of 2D arrays –Accessing element of 2D arrays –Reading and displaying elements.
Storage classes, recursion,
Strings versus character arrays: –Initializing strings, Reading strings, displaying string, String-handling functions.

Section D

Pointer Concepts: Need of Pointers, Integer & Character pointers, array and functions, Array & pointers, function & pointers, Parameter passing by reference.
Structure & Union: Definition of Structure & union, Structure & Pointers, Nesting of Structures, Structure and arrays, Arrays of pointer to structures
Files Concepts in C: Using files in C, Buffer and streams, working with text files and Binary Files, file operations using standard library and system calls, File management I/O functions, Random Access Files
Reading, Writing text and binary files.

Text Books:
1. Kanetkar, "Let us C", BPB Publications
2. E. Balaguruswamy, "Programming in C", Tata McGraw Hill

Reference Books
1. V Rajaraman "Fundamentals of computers"
2. D.Dromey, "How to solve it by computers" (Prentice Hall)
3. Richie and Kerningham, "C Programming"

Name of the Course	Communication & Professional Skills in English		
Course Code	**HU-2001**	Credits-3	L-3, T-0, P-0
Lectures to be Delivered	**39 (1 Hr Each)**		
Semester End Examination	**Max Marks: 100**	**Min Pass Marks: 40**	**Maximum Time: 3 hrs**
Continuous Assessment (based on sessional test (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 and 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 and 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 question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E.

SECTION-A

Reading Skills: The skill of effective reading – eye movements, fixations, regression and visual wandering, the right approach to reading; Factors affecting the style of reading – reader, related material related and environmental; Memory, retention, association of reading material.
Kinds of Reading: Introduction to phonetics – familiarization with speech sounds and their symbols – articulation of speech sounds – stress and intonation.
Grammar: Word building use of punctuation marks, articles, tenses, abbreviations, prepositions, idioms & phrases, transformation of sentences, incorrect to correct English, single word for a group of words.

SECTION-B

Writing Skills: Business letters: principles, structure and style of writing business i.e., sales letters, claim and adjustment letters, inviting quotations/tenders, writing a memo, job application letters, preparing a personal resume; Effective Meetings: Qualities i.e. planning, processing the discussion, conducting a meeting, use of different type of questions, summaries, handling problem situations and problem people, writing notices, agenda and minutes of meetings; Report writing: Characteristics, types of reports, structure of technical/research reports, preparatory steps to report writing; Elements of style: Definition of style, characteristics of a good technical style – practical hints to improve the style of writing ; précis writing; Comprehension of passages.

SECTION –C

Listening Skills: Barriers to listening, effective listening and feedback skills, Telephone techniques. Considerations of listening and voice, developing telephone skills – preparing for the call, controlling the call, follow up action. Handling difficult calls and difficult callers.

SECTION- D

Speaking And Discussion Skills: Effective speaking: Preparation i.e., deciding the objective, preparing the environments, organizing the material selection of words, voice modulation, speed, expression, body language, dealing with questions, dealing with nervousness, presentation of audio-visual aids; Group Discussions: The art of participating in group discussion i.e., initiative, cooperation with group members, analysis of the issue, putting one's views effectively, establishing leadership.
Assignments / Seminars / discussions may be given for following skill development.

a)	Word processing a document	(b) Report writing
c)	Preparing agenda for meeting	(d) Preparing minutes of the meeting/seminars.
e)	Press Releases	(f) Preparing a Brochure
g)	Advertisements	(g) Preparing a power point slide show on a PC/OHP

Books Recommended:

1	An Approach to Communication Skills	:I. Bhatacharya	:Dhanpat Rai & Co.
2	Business Correspondence and Report writing	: R.C.Sharma & Krishna Mohan	:Tata McGraw Hill
3	Business Communication	: K.K.Sinha	: Galgotia Publishing
4	The Functional Aspects of Communication Skills	: Dr. P Prasad	: S. K. Kataria & Sons
5	Handbook of Practical Communication Skills	: Chrissie Wright	: JAICO Books
6	Written Communication Skills	:Hatton,Michael	: ISTE
7	Common Errors in English	:Abul Hashem	: Ramesh Pub. House
8	Spoken English for India	:R.K.Bansal & J.B. Harrison	: Orient Longman

Name of the Course	Basic Electrical Engineering		
Course Code	***EE – 2001***	Credits: 4	L-3, T-1, P-0
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 earthling.

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.

REFRENCE Books:

1	Electrical Engineering Fundamentals	: Vincent Del Toro	: PHI
2	Basic Electrical Engineering	: T.K. Nagsarkar & M. S Sukhija	: Oxford University Press
3	Basic Electrical Engineering	: Nagrath & Kothari	: TMH.
4	Basic Electrical Engineering	: Van Valkenberg	: Cenage India
5	Electrical Technology (Vol-I)	: B. L. Theraja & A.K. Theraja	: S. Chand & C0.
6	Electrical & Electronic Technology (8^{th} ed.)	: Edwards Huges	:Pearson Education

Name of the Course	**C Programming Lab.**			
Course Code	**IT -2002**	Credits-1		L-0, T-0, P-2
Lectures to be Delivered	26 Hrs. of Lab. Work (2 hrs. per week)			
Semester End Examination	Max Marks: 50	Min Pass Marks: 20		Maximum Time: 3 hrs
Laboratory Continuous Assessment	Lab work 30% Lab Record 25% Viva/ Hands on 25% Attendance 20%		Max Marks: 50	Min Pass Marks: 25

Instructions for paper setter / candidates

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

Viva-voce examination will be related to the practicals performed / project executed by the candidate related to the paper during the course of the semester.
Tentative list is given below to be developed in the form of files by the faculty incharge. However, the faculty incharge can make modifications accordingly.

Write a program to find the largest of three numbers (if-then-else).
Write a program to find the largest number out of ten numbers (for statement).
Write a program to find the average male height & average female heights in the class
(input is in form of sex code, height).
Write a program to find roots of quadratic equation using functions and switch statement.
Write a program using arrays to find the largest and second largest no.
Write a program to multiply two matrices.
Write a program to read a string and write it in reverse order.
Write a program to concatenate two strings.
Write a program to sort numbers using the Quick sort Algorithm.
Represent a deck of playing cards using arrays.
Write a program to compute the Fibonacci series.
Write a program to find weather the number is palindrome or not.

Reference books:

1	**Let us C**	**: Yashwant Kanetkar**	**: BPB Publication**
2	**Programming in C**	**: E.Balaguruswamy**	**:Tata McGraw Hill**

Name of the Course	**Basic Electrical Engineering Lab**			
Course Code	**EE – 2002**		Credits : 1	L-0, T-0, P-2
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 theorems .
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.

Reference books:

1	Experiment in Basic Electrical Engineering	: S. K. Bhattachrya & K.M. Rastogi	: New Age International Pub.
2	Experiment and Viva – Voce on Electrical Machines	: V.N. Mittal & A. Mittal	: Standard Publishers

Name of the course	**Electronics and Communication Workshop**			
Course Code	EC-2001	Credits-2		L-0, T-0, P-3
Lectures to be Delivered	39 Hrs. (Lab Session = 13(3 hrs. each))			
Semester End Examination	Max Marks: 50	Min Pass Marks: 20		Maximum Time: 3 hrs
Laboratory Continuous Assessment	Lab work 30% Lab Record 25% Viva/ Hands on 25% Attendance 20%		Max Marks: 50	Min Pass Marks: 25

Instructions for paper setter / candidates

Laboratory examination will consist of two parts:

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

(ii) Viva-voce examination (25 marks)

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

1. Familiarization/Identification of electronics components with specification (Functionality, type, size, colour coding, package, symbol, cost etc. Active, passive, electronics, electromechanical, wires, cables, connector, fuses, switches, relays, crystals, displays, fasteners, heat sink etc.
2. Drawing of electronic circuit diagrams using BIS/IEEE symbols and introduction to EDA tools, interpret data sheets of discrete components and IC's, estimation and costing.
3. Familiarization/application of testing instruments and commonly used tools (multimeter, CRO, Function generator, Power Supply, IC tester.)
4. Testing of electronic components (resistor, capacitor, diode, transistor, UJT and JFET using multimeter)
5. Interconnection methods and soldering practices (Bread board, wrapping, crimping, soldering – types – selection of materials and safety precautions, soldering practice in connectors and general purpose PCB, crimping.)
6. Printed Circuit Board (PCB) (Types, single sided, double sided, PTH, Processing methods, design and fabrication of a single sided PCB for simple circuit with manual etching (ferric chloride) and drilling)
7. Assembling electronic circuits: Diode rectifiers, capacitor filters, zener/IC regulator, square wave generation using IC 555 timer in IC base, sine wave generator using IC 741 OP-AMP in IC base, AND and NAND gates in DTL.

Note: - Industrial visits can be undertaken to various industries available in the vicinity of the concerned Engineering College. One project at the end of semester has to be submitted by a group of six students.