B. TECH. SEMESTER – I (EC/CE/IT)

SUBJECT: BASIC ELECTRICAL ENGINEERING

Teaching Scheme (Hours/Week)				Credits	Examination Scheme				
Lect	Tut	Prac	Total		Ext	Sess.	TW	Pract.	Total
3	1	2	6	5	60	40	50*	-	150

Reference Code ESC101

*TW Marks includes Viva based on TW

A. COURSE OBJECTIVE

The course imparts an in-depth understanding of the fundamental concepts with an objective to expose the students to the various types of electrical, electronic and magnetic circuits and their applications. This course is designed to provide knowledge of fundamentals and various laws in electromagnetic and magnetic circuits, electrostatics.

B. DETAILED SYLLABUS

[1] DC CIRCUITS

Electrical circuit elements (R, L and C), impact of temperature, voltage and current sources, Kirchhoff current and voltage laws, analysis of simple circuits with dc excitation. Superposition, Thevenin and Norton Theorems. Time-domain analysis of first order RL and RC circuits.

[2] AC CIRCUITS

Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel), resonance. Three-phasebalanced circuits, voltage and current relations in star and delta connections

[3] ELECTRO-MAGNETIC INDUCTION

Introduction, Magnetic effect of electric current, Current carrying conductor in magnetic field, Law of electromagnetic induction, Induced emf, Self-Inductance (L), Mutual Inductance (M), and Coupling coefficient between two magnetically coupled circuits (K), Inductances in seriesand parallel.

[4] MAGNETIC CIRCUITS

Introduction, Definition of Magnetic quantities, Magnetic circuit, Leakage flux, Fringing effect, Comparison between magnetic and electric circuits

[5] TRANSFORMERS

Magnetic materials, BH characteristics, ideal and practical transformer, equivalent circuit, losses in transformers, regulation and efficiency. Auto-transformer and three-phase transformer connections

[6] ELECTRICAL MACHINES

Generation of rotating magnetic fields, Construction and working of a three-phase induction motor, Significance of torque-slip characteristic. Loss components and efficiency, starting and speed control of induction motor. Single-phase induction motor. Construction, working, torque-speed characteristic and speed control of separately excited

DC motor. Construction and working of synchronous generators, Construction, Principles and working theory and Types of DC Motors & Generators, 1-Ph & 3-Ph Induction Motor, AC Generator

C. RECOMMENDED TEXT / REFERENCE BOOKS

1) Basic Electrical, Electronics and Computer Engineering, R. Muthu Subramanian, S.Salvahanan, K. A. Muraleedharan, 2nd Edition, Tata McGraw Hill

2) Electronics Principles, Albert Paul Malvino, 6th Edition, Tata McGraw Hill

3) Electrical Technology (Vol: II), B. L. Theraja , A. K. Theraja, 23rd Edition, R. Chand &Company

4) Basic Electrical Engineering, D.P. Kothari, I. J. Nagrath, 3rd Edition, Tata McGraw Hill

5) Introduction to VLSI Circuit & Systems, John P. Uyemura, 1st Edition, John Willey & Sons Inc.

6) Basic Electrical Engineering, D.C. Kulshreshtha, 1st Edition, Tata McGraw Hill

7) Electrical and Electronics Technology, E. Hughes, 10th Edition, Pearson

8) Electrical Engineering Fundamentals, V.D. Toro, 2nd Edition, Prentice Hall India

9) Fundamentals of Electrical Engineering, L.S. Bobrow, , Oxford University Press

D. COURSE OUTCOMES

At the end of the course, student should be able to

- Apply basic circuital laws (KVL, KCL and Ohm's) and Theorems (Thevenin's and Norton's) for simplifying the complex resistive network to compute node voltages and loop currents for given excitation.
- Analyze Single Phase AC Circuits, compute and demonstrate the waveforms and phasor diagram representation of alternating quantities.
- Design low pass, high pass, band pass and band elimination filter networks, analyse the frequency response of circuits to show the correlation between time domain and frequency domain response specifications.
- Analyze 3-Phase circuit (star-delta) and compute power for balanced and unbalanced load.
- Predict the behaviour of any electrical and magnetic circuits with an ability to identify, formulate, and solve magnetic circuit problems in electrical machines
- Model the Equivalent Circuit of a Transformer for Performance Analysis
- Discriminate the constructional details, principle of operation and applications of AC and DC electrical machines.

B.TECH. SEMESTER – I (EC/CE/IT)

SUBJECT: PROGRAMMING FOR PROBLEM SOLVING - I

Teaching Scheme (Hours/Week)				Credits	Examination Scheme				
Lect	Tut	Prac	Total		Ext	Sess.	TW	Pract.	Total
4	0	3	7	5.5	60	40	50	-	150

Reference Code ESC201

A. COURSE OBJECTIVE

The objectives of teaching this course are:

- To impart in-depth understanding of fundamental programming concepts to build C programs.
- To explain conditional branching, iteration/looping, code reusability and pointers using C Programming Language.
- To demonstrate and teach how to code, document, test, and implement a well-structured C program.

B. DETAILED SYLLABUS

[1] OVERVIEW OF C

Basic structure of C program, compiling and running C program

[2] CONSTANTS, VARIABLES AND DATA TYPES

Types of constants, basic data types, identifier, variable, enum, symbolic constant, typedef, keywords, overflow and underflow

[3] OPERATORS AND EXPRESSIONS

Arithmetic, relational, logical, assignment, bitwise, and sizeof() operators, operator precedenceand associativity, expression evaluation

[4] MANAGING INPUT OUTPUT OPERATIONS

getchar() and putchar() functions, formatted I/O using printf() and scanf()

[5] DECISION MAKING AND BRANCHING

if and if...else statement, nested and ladder if...else, conditional operator, switch statement, gotostatement with warning

[6] DECISION MAKING AND LOOPING

while, do...while, and for loops, nested loops, break and continue statements

[7] ARRAYS AND STRINGS

Introduction to arrays, declaration, initialization and access of one-dimensional and two-dimensional arrays, Introduction to multi-dimensional and variable length arrays, declaration and initialization of strings, printing and scanning strings to/from standard I/O, string handlingfunctions, list of strings

[8] USER-DEFINED FUNCTIONS

Function prototype and function declaration, function definition, function call, actual and

formal parameters/arguments, return type and return statement, Nested function call, recursion,scope, visibility, and lifetime of variables.

[9] STRUCTURES AND UNIONS

Defining structure, declaring and initializing structure variables, typedef, accessing structure members, copying and comparing structure variables, nested structures, arrays and structures,structures and functions, unions

[10] POINTERS

Introduction, accessing address of a variable, declaration and initialization of pointer variables, Accessing variable using pointer, chain of pointers, scale factor and pointer expressions, pointers and arrays, pointer to array Vs array of pointers, passing arrays and strings to the function, array of pointers, pointers and functions, pointers and structures, const pointer vs pointer to const

C. RECOMMENDED TEXT / REFERENCE BOOKS

1) Programming in ANSI C by Balagurusamy, 8th Ed., Tata McGraw Hil

2) Programming with C by Byron Gottfried, 3rd Ed., McGraw Hill Education

3) The C Programming Language by Kernighan and Ritchie, 2nd Ed., PHI Learning

4) Expert C Programming: Deep C Secrets by Peter Van Der Linden, Pearson Education

5) Let Us C by Yashvant Kanetkar, 12th Ed., BPB Publication

6) Programming in C by Ashok N. Kamthane, 2nd Ed., Pearson Education

D. COURSE OUTCOMES

At the end of the course, student should be able to

- Use and understand language syntax and concepts for C Programming.
- Comprehend and use C Programming concepts to solve algorithmic and logical problems.
- Analyse the given problem and to formulate appropriate C language solution based on definitive language concept(s).
- Design a flowchart or a diagram for given problem and create C programs using decision making, branching, looping, user defined function, array, structure, pointers, etc.
- Apply concepts to write, compile, debug, execute, and document C programs with different test cases using appropriate tool(s).

B. TECH. SEMESTER – I (EC/CE/IT)

SUBJECT: ENGINEERING GRAPHICS AND DESIGN

Teaching Scheme (Hours/Week)				Credits	Examination Scheme				
Lect	Tut	Prac	Total		Ext	Sess.	TW	Pract.	Total
1	0	4	5	3	-	-	100*	-	100

Reference Code ESC102

*TW Marks includes Viva based on TW

A. COURSE OBJECTIVE

The objectives of teaching this course are:

- To Understand the drawing importance in Engineering.
- To Describe the 3-Dimensional object into different 2-Dimensional view.
- To Develop skills in Reading and Interpretation of Engineering Drawings.
- To enhance drawing skills through hands-on training in a CAD lab using engineering software.

B. DETAILED SYLLABUS

[1] Introduction to Engineering Drawing Covering, Principles of Engineering Graphics and their significance, usage of Drawing instruments, lettering, Conic sections including the Rectangular Hyperbola (General method only); Cycloid, Epicycloid, Hypocycloid and Involute; Scales –Plain, Diagonal and Vernier Scales;

[2] Orthographic Projections Covering, Principles of Orthographic Projections-Conventions Projections of Points and lines inclined to both planes; Projections of planes inclined Planes
- Auxiliary Planes;

[3] Projections of Regular Solids Covering, those inclined to both the Planes- Auxiliary Views; Draw simple annotation, dimensioning and scale. Floor plans that include: windows, doors, and fixtures such as WC, bath, sink, shower, etc.

[4] Sections and Sectional Views of Right Angular Solids Covering, Prism, Cylinder, Pyramid, Cone – Auxiliary Views; Development of surfaces of Right Regular Solids - Prism, Pyramid, Cylinder and Cone; Draw the sectional orthographic views of geometrical solids, objects fromindustry and dwellings (foundation to slab only)

[5] Isometric Projections Covering, Principles of Isometric projection – Isometric Scale, Isometric Views, Conventions; Isometric Views of lines, Planes, Simple and compound Solids; Conversion of Isometric Views to Orthographic Views and Vice-versa, Conventions;

[6] Overview of Computer Graphics Covering, listing the computer technologies that impact on graphical communication, demonstrating knowledge of the theory of CAD software.

[7] Customization & CAD Drawing consisting of set up of the drawing page and the printer, including scale settings, Setting up of units and drawing limits; ISO and

ANSI standards for coordinate dimensioning and tolerancing; Orthographic constraints, Snap to objects manually and automatically; Producing drawings by using various coordinate input entry methods to draw straight lines, Applying various ways of drawing circles;

[8] Annotations, layering & other Functions Covering applying dimensions to objects, applying annotations to drawings; Setting up and use of Layers, layers to create drawings, Create, edit and use customized layers; Changing line lengths through modifying existing lines(extend/lengthen); Printing documents to paper using the print command; orthographic projection techniques; Drawing sectional views of composite right regular geometric solids and project the true shape of the sectioned surface; Drawing annotation, Computer-aided design (CAD) software modeling of parts and assemblies. Parametric and non-parametric solid, surface, and wire frame models. Part editing and two-dimensional documentation of models. Planar projection theory, including sketching of perspective, isometric, multi view, auxiliary, and section views. Spatial visualization exercises. Dimensioning guidelines, tolerancing techniques; dimensioning and scale multi views of dwelling;

C. RECOMMENDED TEXT / REFERENCE BOOKS

1) Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar PublishingHouse
2) Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, PearsonEducation
3) Agrawal B. & Agrawal C. M. (2012), Engineering Graphics, TMH Publication
4) Narayana, K.L. & P Kannaiah (2008), Text book on Engineering Drawing, Scitech Publishers
5) (Corresponding set of) CAD Software Theory and User Manuals

D. COURSE OUTCOMES

At the end of the course, student should be able to

- Skills in understanding and interpreting engineering drawings so that concepts can be communicated graphically more effectively.
- Demonstrate correct usage of methods, concept, and theories to illustrate and solve problem of conics, lines, planes, solids, and surface and many more.
- Choose a suitable standard projection method, break down a complex 3D problem into various orthographic and sectional orthographic views, and highlight missing features.
- Practical Exposure in a computer aided software to generate isometric projection and compose standard components of different streams

B. TECH. SEMESTER – I (EC/CE/IT)

SUBJECT: SOFTWARE WORKSHOP

Teaching Scheme (Hours/Week)				Credits	Examination Scheme				
Lect	Tut	Prac	Total		Ext	Sess.	TW	Pract.	Total
0	0	2	2	1	-	-	50*	-	50

Reference Code ESC202

*TW Marks includes Viva based on TW

A. COURSE OBJECTIVE

The objective of the course is to familiarize students with various software tools and technology. The course aims at providing hands on experience related to basic software installation, usage of Operating systems and various essential software utilities.

B. DETAILED SYLLABUS

[1] OPERATING SYSTEM BASICS

Introduction to Operating System and Linux Architecture

[2] SOFTWARE INSTALLATION

Installation of open source/freeware software using package manager for programming/simulation.

[3] SHELL COMMANDS

Linux usage, commands & shell scripting. Command structure and general purpose utility

[4] FILE HANDLING

basic of file handling. The file system, Handling ordinary files, File attributes and permission,file system details

[5] SHELL SCRIPTING

Basic Shell commands, Looping and Branching,

[6] SHELL UTILITIES

Find command and shell, simple filters, advance filters.

[7] EDITORS

VI editor for basic text editing, LATEX for scientific documents and report writing.

C. RECOMMENDED TEXT / REFERENCE BOOKS

1) Unix : Concepts and Applications, Sumitabha Das, 4th Edition, Tata McGraw Hill

D. COURSE OUTCOMES

After completing the course, the students will

- have knowledge of installation and maintainance of softwares
- be able to perform computational tasks using various utilities and commands related to operating systems
- be able to manage and maintain software system on a PC.

B. TECH. SEMESTER II (EC/CE/IT)

SUBJECT: MATHEMATICS-II

Teaching Scheme (Hours/Week)				Credits	Examination Scheme				
Lect	Tut	Prac	Total		Ext	Sess.	TW	Pract.	Total
3	1	0	4	4	60	40	0	0	100

Reference Code BSC301

A. COURSE OBJECTIVE

The objective of this course is to familiarize the prospective engineers with techniques in Differential Equations, numerical methods and laplace transform.

B. DETAILED SYLLABUS

[1] FIRST ORDER ORDINARY DIFFERENTIAL EQUATIONS AND INTRODUCTION TO HIGHER ORDER DIFFERENTIAL EQUATIONS

Exact, linear and Bernoulli's equations, Euler's equations, Equations not of first degree: equations solvable for p, equations solvable for y, equations solvable for x and Clairaut's type, second order linear differential equations with variable coefficients, Method of variation of parameters, Cauchy-Euler equation.

[2] NUMERICAL METHODS

Ordinary differential equations: Taylor's series, Euler and modified Euler's methods, Runge-Kutta method of fourth order for solving first order equations, Solution of algebraic and transcendental equations: Newton Raphson's Method, Numerical integration : Trapezoidal rule and Simpson's 1/3rd and 3/8 rules.

[3] MULTIVARIABLE CALCULUS (INTEGRATION)

Multiple Integration: Double integrals (Cartesian), Change of order of integration in double integrals, Change of variables (Cartesian to polar), Applications: areas and volumes, Triple integrals (Cartesian), Scalar line integrals,Vector line integrals, Scalar surface integrals, Vector surface integrals, Theorems of Green, Gauss and Stoke's.

[4] LAPLACE TRANSFORM

Laplace Transform, Properties of Laplace Transform, Laplace transform of periodic functions, Finding inverse Laplace transform by different methods, Convolution theorem. Evaluation of integrals by Laplace transform, Solving ODE by Laplace Transform method.

C. RECOMMENDED TEXT / REFERENCE BOOKS

1) B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 40th Edition, 2007.

2) G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Ed.,Pearson, 2002.

3) Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.

4) W. E. Boyce and R. C. DiPrima, Elementary Differential Equations and Boundary ValueProblems, 9th Edn., Wiley India, 2009.

5) S. L. Ross, Differential Equations, 3rd Ed., Wiley India, 1984.

6) E. A. Coddington, An Intro. to Ordinary Differential Equations, Prentice Hall India, 1995.

7) J. W. Brown and R. V. Churchill, Complex Variables and Applications, 7th Ed., Mc- GrawHill, 2004.

8) N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications,Reprint, 2008.

D. COURSE OUTCOMES

After completing the course, the students will

- Solve engineering problems involving differential equation, numerical methods and laplace transform.
- Use mathematical tools to solve problems in differential equations, numerical methods and laplace transform.

B. TECH. SEMESTER – II (EC/CE/IT)

SUBJECT: PROGRAMMING FOR PROBLEM SOLVING - II

Teaching Scheme (Hours/Week)				Credits	Examination Scheme				
Lect	Tut	Prac	Total		Ext	Sess.	TW	Pract.	Total
4	0	3	7	5.5	60	40	50*	-	150

Reference Code ESC201

*TW Marks includes Viva based on TW

A. COURSE OBJECTIVE

The objectives of teaching this course are:

- To provide fundamental concepts of object-oriented programming like abstraction, inheritance, polymorphism etc. and explain differences between object-oriented programming and procedural programming
- To teach programmatic implementation of these concepts using c++ language.
- Explain signifiance of these concepts to learn subjects like software engineering and object-oriented design and analysis.

B. DETAILED SYLLABUS

[1] BASICS OF C++

Overview, Program structure, keywords, identifiers, constants, data types, symbolic constants, declaration of variables, operators, namespaces, control structures, dynamic memory – C style – malloc(), calloc(), realloc() and free() Vs C++ style - new and delete keywords, reference andpointer

[2] FUNCTIONS IN C++

main function (variations in signature), function prototype, inline functions, call and return by reference, default parameters, function overloading

[3] INTRODUCTION TO OBJECT ORIENTED PROGRAMMING

Procedural Vs Object Oriented Programming, Principles of OOP, Benefits and applications of OOP

[4] CLASSES AND OBJECTS – ENCAPSULATION AND ABSTRACTION

Introduction, private and public members, Defining member functions, static members, Objects as function arguments and return type, friend functions, const member functions, Constructors and their types, Destructor, Operator overloading, type conversion

[5] INTRODUCTION TO C++ STRING CLASS

[6] INHERITANCE

Introduction, types of inheritance – single, multiple, multilevel, hierarchical, and hybrid inheritance, Protected members, overriding, virtual base class

[7] POLYMORPHISM

Introduction, Pointers and Objects, this pointer, pointer to derived classes, virtual and pure virtual functions, dynamic binding

[8] INPUT/OUTPUT

Introduction to streams, standard I/O stream objects, stream classes, unformatted and formatted I/O, manipulators

[9] EXCEPTION HANDLING

Basics of exception handling, try-catch-throw, rethrowing exceptions, user defined exceptions

[10] TEMPLATES

Basics of class templates and function templates

C. RECOMMENDED TEXT / REFERENCE BOOKS

1) Object-Oriented programming with C++, Seventh Ed., by E Balagurusamy, TMH publication
2) The C++ Programming Language, Fourth Ed., by Bjarne Stroustrup, Addison-Wesleypublication
3) Object-Oriented Programming in C++, Fourth Edition, by Robert Lafore, SAMS publication
4) Accelerated C++: Practical Programming by Example, First Edition, by Andrew Koenig andBarbara E. Moo, Addison-Wesley publication
5) C++ Black Book, First edition, by Steven Holzner, Paraglyph Press
6) C++: The Complete Reference, Fourth Edition, by Herbert Schildt, McGraw Hill Education

D. COURSE OUTCOME

At the end of the course students should be able to:

- Use and understand language syntax and concepts for C++ Programming along with templates for class and function.
- Apply Object Oriented Programming (OOP) concepts to solve algorithmic and logical problems.
- Identify the given problem and to formulate appropriate C++ language solution based on OOP Principle(s).
- Write C++ programs using Encapsulation, Abstraction, Inheritance, Polymorphism, Exception Handling, etc. to solve given problem(s).
- Apply concepts to write, compile and execute C++ programs with different test cases. Also be able to debug and document C++ programs.

B. TECH. SEMESTER II (EC/CE/IT)

SUBJECT: PHYSICS

Teaching Scheme (Hours/Week)				Credits	Examination Scheme				
Lect	Tut	Prac	Total		Ext	Sess.	TW	Pract.	Total
3	1	2	6	5	60	40	50*	-	150

Reference Code BSC101

*TW Marks includes Viva based on TW

A. COURSE OBJECTIVE

The objective of this course is to relate the concept of physics with the ever-growing field of Information and Communication Technology. This course provides knowledge on the electronic devices such as Semiconductor Diodes: Bipolar Junction transistors, Amplifiers: Sinusoidal Oscillators: & build capability for designing various circuits of electronic devices. The course elaborates the concepts associated with Optoelectronics, Communication and Semiconductor switching devices. It also provides comprehensive idea about analog modulation & demodulation techniques (AM, FM and PM) and digital modulation (ASK, FSK and PSK).

B. DETAILED SYLLABUS

[1] SEMICONDUCTORS

Intrinsic and extrinsic semiconductors, Carrier generation and recombination, Carrier transport: diffusion and drift, p-n junction, Metal-semiconductor junction (Ohmic and Schottky), Semiconductor materials of interest for optoelectronic & other devices.

[2] DIODE

Introduction to P-N junction Diode and V-I characteristics, Half wave and Full-wave rectifiers,capacitor filter. Zener diode and its characteristics, Zener diode as voltage regulator, Special purpose diodes.

[3] LIGHT-SEMICONDUCTOR INTERACTION

Radiative transitions and optical absorption, LED and LASER, Photo detectors.

[4] ACTIVE COMPONENTS AND APPLICATIONS

BJT: Structure and input-output characteristics of a BJT, The Unbiased Transistor, Transistor Currents , Biased Transistor, a single stage voltage divider biasing, Emitter Bias, The CE Connections, The Base Curve, Collector curve, Transistor approximation Variation in current Gain, The Load Line, The Operating point, Recognizing Saturation, BJT as a switch & Amplifiers, LED Drivers.

[5] OSCILLATORS

General form of oscillator, Sinusoidal oscillator, phase shift oscillator, Crystal Oscillator.

[6] MOSFET

MOS physics and mode of operations, nFET current-voltage relationship, MOS pass characteristics and CMOS inverter, Dynamic RAM (DRAM) 1T bit-cell.

[7] FIBER OPTICS

Fiber Optics and Optoelectronics, Historical Developments, A Fiber-Optic Communication System, Advantages of Fiber-Optic Systems, Ray Propagation in Optical Fibers, Fundamental Laws of Optics, Ray Propagation in Step-Index Fibers, Ray Propagation in Graded-Index Fibers

[8] COMMUNICATION SYSTEMS

Communication system components, Analog modulation- AM, FM,PM.
Digital modulation-ASK, FSK, PSK

C. RECOMMENDED TEXT / REFERENCE BOOKS

1) Electronics Principles, Albert Paul Malvino, 6thEdition, Tata McGraw Hill

2) David Griffiths, Introduction to Electrodynamics

3) S. M. Sze, Semiconductor Devices: Physics and Technology, Wiley (2008).

4) R.P Khare, Fiber Optics and Optoelectronics, Oxford University Press

5) Sanjay Sharma, Communication Systems: Analog and Digital

6) Halliday and Resnick, Physics

7) W. Saslow, Electricity, magnetism and light

8) Singh, Semiconductor Optoelectronics: Physics and Technology, McGraw-Hill Inc. (1995).

9) B. E. A. Saleh and M. C. Teich, Fundamentals of Photonics, John Wiley & Sons, Inc., (2007).

10) Yariv and P. Yeh, Photonics: Optical Electronics in Modern Communications, OxfordUniversity Press, New York (2007).

11) P. Bhattacharya, Semiconductor Optoelectronic Devices, Prentice Hall of India (1997)

12) Behrouz A. Forouzan, Data communication and networking.

13) B. P lathi, Modern Digital and Analog Communication Systems, Third edition.

D. COURSE OUTCOME

At the end of the course, students will be able to

- Illustrate intrinsic and extrinsic semiconductors, their applications and carrier generation and recombination with variations in doping density, temperature and other regulations.
- Design half wave, full wave rectifier circuit and voltage regulator circuit using Zener diode, PN diode and NPN, PNP transistors.
- Implement a transistor as a switch and Analyse Transistor input output characteristics, biasing circuits, Compute load line and calculate the operating point.
- Analyse structure of the oscillator and discriminate Sinusoidal oscillator, Phase shift oscillator and Crystal oscillator.
- Assess the performance & characteristics of Opto-electronic semiconductor devices like LED, LASER, Photo detectors
- Devise the ray optics propagation in step index and graded index fiber and Synthesize the use of optoelectronic devices in fiber optic communications.
- Illustrate pro and cons of analog and digital modulation techniques (AM, FM, PM, ASK, FSK, PSK) based on the need of system components.
- Justify the requirement of CMOS based on the fundamental study of nMOS and pMOS and describe working of 1 bit DRAM cell.

B. TECH. SEMESTER II (EC/CE/IT)

SUBJECT: HARDWARE WORKSHOP

Teaching Scheme (Hours/Week)				Credits	Examination Scheme				
Lect	Tut	Prac	Total		Ext	Sess.	TW	Pract.	Total
0	0	4	4	2	-	-	100*	-	100

Reference Code ESC202

*TW Marks includes Viva based on TW

A. COURSE OBJECTIVE

The objective of the course is to familiarize students with various hardware tools and techniques. The course aims at imparting practical knowledge of various electronic components, computer hardware, and internet technology.

B. DETAILED SYLLABUS

[1] ELECTRONIC COMPONENTS

Digital Multi-meter, Power Supply, Function Generator, Cathode Ray Oscilloscope, Digital Oscilloscope, Measurement of Phase Difference in single phase circuit, Various Electrical and Electronics component like LED, LDR, Photo-diode, MOSFET, MCB and Relay.

[2] COMPUTER HARDWARE

Introduction to a personal computer and its basic peripherals, installation of Operating System Software and the required device drivers. Students are suggested to perform similar tasks on theLaptop scenario wherever possible.

[3] PERIPHERALS

Programming of Computer Ports & Interfacing of Electronic Components, Cables and Connectors like RJ45, RS232 and CRO probe.

[4] INTERNET

Introduction to Internet & World Wide Web modules, Making a PC Internet ready: Introduction to Internet and TCP/IP, Ethernet Connection, WiFi connection, configure TCP/IP (IP, Gateway,DNS, and Proxy), and use of ping command, Information sharing and data transfer over Local Area Network and Internet.

[5] WEB INFRASTRUCTURE

Basic Components of Web Sites, Front end & back end tools and technology. HTML & CSS, Developing, Configuring and deploying a website.

[6] IOT BOARDS AND CIRCUIT SIMULATION

Introduction to IOT boards like Arduino, Raspberry Pie etc. Interfacing, Circuit designing andPCB designing.

[7] MINI PROJECT

Student will develop a mini project related to the topics listed above.

C. RECOMMENDED TEXT / REFERENCE BOOKS

1) Electronic Components and Materials Principles, Dr. Madhuri A Joshi, 2nd Edition, ShroffPublishers & Distributors PVT. LTD.
2) A Textbook of Computer Hardware and Networking, Jyotika Deshmukh, D J Publications
3) Learning Web Design, Jennifer Robbins, 4th edition, O'Reilly Media

D. COURSE OUTCOME

After completing the course, the students will,

- have knowledge of various electronics components and computer hardware.
- The students will be aware of Internet Technology infrastructure.