# CHHATTISGARH SWAMI VIVEKANAD TECHNICALUNIVERSITY, BHILAI

## Scheme of Teaching & Examination

## BE (Electronics & Instrumentation Engineering) III Semester

| Sl. No. | Board of Studies | Subject Code | Subject Name | Periods Per Week | | | Scheme of Exam. (Theory/ Practical) | | | Total Marks | Credit L+(T+P)/2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | ESE | CT | TA | | |
| 1 | Applied Mathematics | 327351(14) | Mathematics - III | 4 | 1 | - | 80 | 20 | 20 | 120 | 5 |
| 2 | Electronics and Instrumentation | 327352(27) | Basic Electronics | 3 | 1 | - | 80 | 20 | 20 | 120 | 4 |
| 3 | Electronics and Instrumentation | 327353(27) | Measurement & Instruments | 3 | 1 | - | 80 | 20 | 20 | 120 | 4 |
| 4 | Electronics and Instrumentation | 327354(27) | Network Analysis & Synthesis | 3 | 1 | - | 80 | 20 | 20 | 120 | 4 |
| 5 | Electronics and Instrumentation | 327355(27) | Programming with 'C' | 3 | 1 | - | 80 | 20 | 20 | 120 | 4 |
| 6 | Electronics and Telecomm. | 327356(28) | Digital Logic Design | 3 | 1 | - | 80 | 20 | 20 | 120 | 4 |
| 7 | Electronics and Instrumentation | 327361(27) | Programming with 'C' Laboratory | - | - | 3 | 40 | - | 20 | 60 | 2 |
| 8 | Electronics and Instrumentation | 327362(27) | Basic Electronics Laboratory | - | - | 3 | 40 | - | 20 | 60 | 2 |
| 9 | Electronics and Instrumentation | 327363(27) | Measurement & Instruments Laboratory | - | - | 3 | 40 | - | 20 | 60 | 2 |
| 10 | Electronics and Instrumentation | 327364(27) | Digital Logic Circuit Laboratory | - | - | 3 | 40 | - | 20 | 60 | 2 |
| 11 | Humanities | 327365(46) | Value Education | - | - | 2 | - | - | 40 | 40 | 1 |
| 12 | | | Library | - | - | 1 | - | - | - | - | - |
| | | | **Total** | **19** | **6** | **15** | **640** | **120** | **240** | **1000** | **34** |

***L: Lecture, T: Tutorial, P: Practical, ESE: End Semester Exam, CT: Class Test, TA: Teachers Assessment***

***Note: Duration of all theory papers will be of Three Hours.***

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|---|---|---|---|
| Name of program: | **Bachelor of Engineering** | | |
| Branch: | **Electronics & Instrumentation** | Semester: | **III** |
| Subject: | **Mathematics – III** | Code: | **327351(14)** |
| Total Theory Periods: | **40** | Total Tutorial Periods: | **10** |
| Class Tests: | **Two (Minimum)** | Assignments: | **Two (Minimum)** |
| ESE Duration: | **Three Hours** | **Maximum Marks: 80** | **Minimum Marks: 28** |

**Course Objectives:**

1. To make the students understand that Fourier series analysis is a powerful method where the formulas are integrals and to have knowledge of expanding periodic functions that explore variety of applications of Fourier series.
2. To equip with the concepts of Fourier transform and calculate elementary Fourier transform and its properties
3. To provide knowledge of Laplace transform of elementary functions including its properties and applications to solve ordinary differentials equations.
4. To provide a sound background of complex analysis to perform a thorough investigation of major theorems of complex analysis and to apply these ideas to a wide range of problems that include the evaluation of both complex line integrals and real integrals.
5. To provide tools to investigate the strength and direction of a relationship between two variables by collecting measurements and using suitable statistical analysis.

**UNIT- I** **FOURIER SERIES:**Periodic functions, Definition of Fourier series, Euler's formulae, Dirichlet conditions, Change of interval, Even and odd functions, Half range Fourier Sine & Cosine series, Parseval's identity, Practical harmonic analysis.

**UNIT-II** **FOURIER TRANSFORM:**Definition of Fourier integrals – Fourier Sine & Cosine integrals, Complex form of Fourier integral, Fourier Sine & Cosine transforms, Complex form of Fourier transform, Linearity, shifting & scaling properties, Modulation theorem, Inverse Fourier transform, Fourier transform of derivatives.

**UNIT- III** **LAPLACE TRANSFORM:**Definition, Linearity, shifting & scaling properties, Transform of elementary functions, Transform of derivatives and integrals, Multiplication by t & division by t. Inverse Laplace transform, Convolution theorem, Transform of periodic functions, Unit step function & Dirac delta function, Initial value & final value theorems, Application to solution of ordinary differential equations.

**UNIT-IV** **COMPLEX VARIABLES:**Limit, Derivative, Analytic function, Cauchy-Riemann equations, Harmonic functions, Application to flow problems. Complex integration, Cauchy's integral theorem and integral formula, Taylor's & Laurent's series, Singular point, Poles & residues, Residue theorem & its application to contour integration.

**UNIT-V** **CORRELATION AND REGRESSION:**Linear correlation, Measures of correlation, Karl Pearson's coefficient of correlation, Spearman's rank correlation coefficient, Bivariate frequency distribution, Regression, lines of regression & coefficients of regression, Standard error estimate.

**Text Books:**


1. Higher Engg. Mathematics by Dr. B.S. Grewal– Khanna Publishers.
2. Advanced Engg. Mathematics by Erwin Kreyszig – John Wiley & Sons.


**Reference Books:**


1. Advanced Engg.Mathematics by R.K. Jain and S.R.K. Iyengar – Narosa Publishing House.
2. Applied Mathematics by P.N.Wartikar& J.N. Wartikar. Vol- II– Pune VidyarthiGrihaPrakashan, Pune.
3. Applied Mathematics for Engineers & Physicists by Louis A. Pipes- TMH.


**Course outcomes:**Students will be able to

1. Define Fourier series including half range series, Harmonic analysis and variety of its applications.
2. To know the definition of Fourier Transform, its proper ties, concepts of rapidly decreasing function and apply convolution theorem.
3. Define (mathematically) Unit step, Unit impulse, Laplace transforms, its properties, Inverse and applications to solve ordinary differential equations.
4. Solve difficult problems using theorems of complex analysis and apply Residue theorem to evaluate real integrals
5. Able to evaluate and interpret Karl Pearson's correlation coefficient and Spearman's correlation coefficient and also find equation of regression line and use them where appropriate.

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|---|---|---|---|
| Name of program: | **Bachelor of Engineering** | | |
| Branch: | **Electronics & Instrumentation** | Semester: | **III** |
| Subject: | **Basic Electronics** | Code: | **327352(27)** |
| Total Theory Periods: | **40** | Total Tutorial Periods: | **10** |
| Class Tests: | **Two (Minimum)** | Assignments: | **Two (Minimum)** |
| ESE Duration: | **Three Hours** | **Maximum Marks: 80** | **Minimum Marks: 28** |

**Course Objectives:**

1. To develop a basic understanding of semiconductors, V – I Characteristics.
2. To give a basic knowledge of rectifying circuits filters circuits for power supply & voltage regulator.
3. To understand the concept of bipolar junction transistor & its characteristics.
4. To develop understanding of transistor biasing & methods of thermal Stability.
5. To understand the basic working of FET, MOSFET & its characteristics.

**UNIT- I** **Introduction:** Introduction, Mobility & conductivity, Intrinsic & Extrinsic Semiconductor, Charge Densities in Semiconductors, Generation & recombination of charges, Diffusion, Potential Variation within a graded Semiconductor, Open circuited p-n Junction, Current component in p-n diode, Diode equation, V-I Characteristics, Temperature dependence of V-I characteristics, Diode Resistance, Diode Capacitance: Transition & Diffusion.

**UNIT-II** **Rectifying Circuits & DC power supplies:** Diode as a circuit element, load line analysis of diode circuit, Half wave rectifier: voltage regulation, ripple factor, ratio of rectification, Transformer Utilization factor (TUF), Full wave rectifier, Bridge Rectifier, Filter Circuit for power Supply: Inductor Filter, Capacitor Filter, LC filter, Multiple LC filter, CLC or $\pi$ filter, Avalanche &Zener Breakdown Mechanisms, Zener Diode Characteristics, Voltage regulator Circuits using Zener diode.

**UNIT- III** **Transistor:** Introduction, Construction, Types: NPN & PNP, current components, Transistor as an amplifier, Input & Output Characteristics of common base, common emitter, & common collector transistor configuration, Early effect, Ebers Moll Model, Reach through.

**UNIT-IV** **Transistor Biasing & Thermal Stabilization:** The operating point, Bias stability, Fixed bias, collector to base bias & Emitter Bias, Stabilization against variation in $I_{co}$, $V_{BE,}$ & $\beta$. Bias compensation, Thermistor &sensistor compensation.

**UNIT-V** **FET & MOSFET:** Field Effect Transistor (FET): Introduction, Construction, Operation, Drain& Transfer Characteristics, FET small signal model, Metal Oxide Semiconductor Field Effect Transistor (MOSFET): Operation, Characteristics of Enhancement & Depletion Type MOSFETs.

**Text Books:**

1. Integrated Electronics: Analog & Digital Circuit Systems – Jacob Millman&Halkias, TMH.
2. Electronic Devices & Circuits I – A P Godse& U.A. Bakshi, Technical Publication Pune, 3rd Ed.

**Reference Books:**

1. Electronic Devices and Circuit Theory – Boylestad&Nashelsky, 8th Ed. PHI.
2. Electronic Devices & Circuit Analysis – K. Lal Kishore, BS Publications.

**Course outcomes:**

1. Student should be able to understand the operating principles of major electronic devices, circuit models and connection to the physical operation of device
2. Student should able to apply this knowledge to the analysis and design of basic circuits.

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|---|---|---|---|
| Name of program: | **Bachelor of Engineering** | | |
| Branch: | **Electronics & Instrumentation** | Semester: | **III** |
| Subject: | **Measurement & Instruments** | Code: | **327353(27)** |
| Total Theory Periods: | **40** | Total Tutorial Periods: | **10** |
| Class Tests: | **Two (Minimum)** | Assignments: | **Two (Minimum)** |
| ESE Duration: | **Three Hours** | **Maximum Marks: 80** | **Minimum Marks: 28** |

**Course Objectives:**

1. To provide knowledge about various types of measuring instruments and their working principle.
2. To provide knowledge about resistance, capacitance and inductance measurements.
3. To provide knowledge about power measuring equipments.

**UNIT- I** **Measurement & Instrumentation:** Measurement Methods, Classification of instruments, Basic Standards & units of measurement, Primary, Secondary & working standards, Instrument characteristic Static terms and characteristics, Dynamic terms & characteristic, Measurement of Error Classification of errors, Statistical analysis of test data, Mathematical theory of errors, Curve fitting by least squares. Selecting an Instrument for measurement.

**UNIT-II** **Potentiometer:** DC Potentiometer: - Basic potentiometer circuit, Laboratory type potentiometer, Multiple Range Potentiometer, Constructional Details of Potentiometer, Precision type potentiometer, Volt ratio Box, Application of D.C. Potentiometer, Self balancing potentiometer. AC Potentiometer: Standardizing AC potentiometer & use of Transfer instruments, Types of AC Potentiometers, Quadrature Adjustment of Currents and Application of AC Potentiometer.

**UNIT- III** **Bridges:** Sources & Detectors, General equation for Bridge Balance. Measurement of Resistance: wheat stone bridge & Kelvin's double bridge. General form of an AC bridge, Measurement of self inductance: Maxwell's Inductance Bridge, Maxwell's Inductance-Capacitance bridge, Hay's Bridge, Anderson's Bridge, Measurement of Capacitance: De Sauty's Bridge, Schering Bridge, High Voltage Schering Bridge. Measurement of relative permittivity with Schering Bridge, Measurement of Mutual Inductance, Heaviside Bridge & its Campbell modification. Measurement of frequency: Wien's bridge, Sources of errors in Bridge Circuit, Wagner earthling device.

**UNIT-IV** **Analog Instruments:** Analog Instruments, Classification, Principle of operation. Galvanometer: construction of D' Arosnval Galvanometer, Torque equation, Dynamic behaviour of Galvanometers: Equation of motion, Underdamped, Undamped critically damped &overdamped motion of Galvanometer. Ballastic Galvanometer: construction, Theory & calibration of ballistic Galvanometer. Flux meter: construction & operation. Vibration Galvanometer, PMMC Construction, Torque Equation, Ohmmeter Meggar.

**UNIT-V** **Measurement of Power & Energy:** Power in DC & AC Circuits, Electrodynamometer wattmeters, Ferrodynamicwattmeters, Low power factor wattmeters, Measurement of power in three phase circuits, Three phase wattmeter, Measurement of Reactive power.Energy meters for AC circuits- theory of induction type meters, Single phase & poly phase energy meter.Testing of Energy meters.

**Text Books:**


1. A. K. Sawhney, "Electrical & Electronics Measurement & Instrumentation", DhanpatRai Publication
2. D.S. Kumar, "Mechanical Measurements & Control", Metropolition Publication


**Reference Books:**


1. Albert Helfrik& Cooper, "Modern Electronic Instrumentation & Measurement Technique", Prentice Hall Of India
2. H. S. Kalsi, "Electronics Instrumentation", Tata McGraw Hill


**Course outcomes:**

1. Students should be able to know about the basics of instrumentation.
2. Students should be able to gain knowledge about measurement and calibration.
3. Students should be able to know about the basic types of bridges.
4. Students should be able to gain knowledge about basic potentiometer circuits.

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| Name of program: | **Bachelor of Engineering** | | |
| Branch: | **Electronics & Instrumentation** | Semester: | **III** |
| Subject: | **Network Analysis and Synthesis** | Code: | **327354(27)** |
| Total Theory Periods: | **40** | Total Tutorial Periods: | **10** |
| Class Tests: | **Two (Minimum)** | Assignments: | **Two (Minimum)** |
| ESE Duration: | **Three Hours** | **Maximum Marks: 80** | **Minimum Marks: 28** |

**Course Objectives:**

- To differentiate between network analysis and synthesis.
- To provide knowledge about the Laplace transformation.
- To provide knowledge about various network theorems.
- To provide knowledge about various types of Two Port Parameters.
- To make familiar the students about network graph theory.

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| **UNIT- I** | **Laplace Transformation and its Application in Circuit Analysis:** Introduction, Laplace Transformation, Laplace Transform of a Derivative, Laplace Transform of an Integral, Laplace Transform of Common Forcing Functions, Initial and Final Value Theorems, Partial Fraction Expansion Method, Step Response of an R-L Circuit, Step Response of an R-C Circuit, Impulse Response of Series RC Network, Impulse Response of Series RL Network, Pulse Response of Series RC Circuit, Pulse Response of Series RL Circuit, Step Response of RLC Series Circuit |
| **UNIT-II** | **Network Theorems:** Introduction, Thevenin's Theorem, Norton's Theorem, Superposition Theorem, Maximum Power Transfer Theorem, Milliman's Theorem, Reciprocity Theorem, Substitution Theorem, Compensation Theorem, Tellegen's Theorem. |
| **UNIT- III** | **Two Port Network Analysis:** Introduction, Network Configurations, Z-Parameters, Y- Parameters, Hybrid Parameters, ABCD Parameters, Condition of Reciprocity and Symmetry in two port parameter representation, Inter-relationship between parameters of two port networks, Expression of input and output impedances in terms of two port parameters, Different types of Interconnections of two port networks, Modeling of network components. |
| **UNIT-IV** | **Network Graph Theory:** Introduction, Concept of a Network Graph, Terminology Used in Network Graph, Relation between Twigs and Links, Properties of a Tree in a Graph, Formation of Incidence Matrix, Properties of Incidence Matrix, Reduced Incidence Matrix, Number of Trees in a Graph, Fundamental Tie-set Matrix, Tie-set Matrix, Fundamental Cut-set Matrix, Cut- set Matrix, KVL in Topological form, KCL in Topological form. |
| **UNIT-V** | **Synthesis of Passive Networks:** Concept of Stability of a System from Pole Zero Concept, Necessary conditions of Stability of a Network Function, Hurwitz Polynomials, Properties of Hurwitz Polynomials, Positive Real Functions, Properties of Positive Real Functions, Concept of Network Synthesis, Properties of expressions of Driving Point Immittances of LC Network, RL, LC and RC Network Synthesis by Foster and Cauer form. |

**Text Books:**


1. Circuit Theory (Analysis & Synthesis) by A. Chakrabarti (DhanpatRai& Co. Pvt. Ltd.)
2. Network Analysis by M.E. Van Valkenbarg, PHI


**Reference Books:**


1. Network Theory: Analysis & Synthesis – SmarjitGhosh, PHI
2. Network Synthesis – T. Lapatra, TMH
3. Circuits and Networks: Analysis and Synthesis – A. Sudhakar&Shyam Mohan S. Palli, TMH


**Course outcomes:**

1. The undergraduates should have ability to apply the concepts of the electrical circuit.
2. They should be able to solve networks using topology principles, network theorems and transient analysis.

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|---|---|---|---|
| Name of program: | **Bachelor of Engineering** | | |
| Branch: | **Electronics & Instrumentation** | Semester: | **III** |
| Subject: | **Programming with C** | Code: | **327355(27)** |
| Total Theory Periods: | **40** | Total Tutorial Periods: | **10** |
| Class Tests: | **Two (Minimum)** | Assignments: | **Two (Minimum)** |
| ESE Duration: | **Three Hours** | **Maximum Marks: 80** | **Minimum Marks: 28** |

**Course Objectives:**

1. Graduate can able to learn a programming language.
2. Graduate can write programs in C to solve problems.
3. Graduate can learn linear and nonlinear data structures.

**UNIT- I** **Introduction to C Language**: History and development, C compilers, data types, types of instructions, input/output functions, operators, precedence and associativity of operators, type casting, developing simple programs, compilation , debugging and testing of programs. Relevance of C language

**UNIT-II** **Conditional Constructs**: if statement, if-else statements, nested if-else, forms of if. Conditional operator, Switch case constructs. Loop control structures, nested loops, break and continue statements. goto statement. Arrays: Syntax and definition, one and multidimensional arrays, reading and writing an array.

**UNIT- III** **Pointers & Functions**: Concepts and types of pointer, Declaring and defining functions, storage classes, call by value, introduction to pointer data types, call by reference, using library functions in programs, macro definitions. Preprocessor directives - #if, #elif, #define etc. Passing arrays in to functions, Recursion.

**UNIT-IV** **Strings**: reading and writing strings, passing a string into a function, using library functions to manipulate strings. Array of strings, Structures: Declaring and using structures. Array of structures, passing structures in to function. Unions and enums, Pointers to structures, Bit fields.

**UNIT-V** **File Handling & Higher language**: reading and writing text files though C programs File manipulating functions: fputc, fgetc, fgets, fputs, fseek, ftell etc. Working with Binary files, fread and fwrite.Command line arguments.Bitwise operators in C, Overview of OOPS, characteristics of OOPS, basics of Class, methods & attributes.

**Text Books:**

1. Let us C – YashwantKanetkar BPB Publication
2. Programming in ANSI C – E. Balaguruswamy Tata Mc-Gcraw Hill

**Reference Books:**

1. Concepts of OOPS- E. Balaguruswamy Tata Mc-Gcraw Hill

**Course outcomes:**

1. Students should be able to learn a programming language.
2. Students should be able to write programs in C to solve problems.

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|---|---|---|---|
| Name of program: | **Bachelor of Engineering** | | |
| Branch: | **Electronics & Instrumentation Engg.** | Semester: | **III** |
| Subject: | **Digital Logic Design** | Code: | **327356(28)** |
| Total Theory Periods: | **40** | Total Tutorial Periods: | **10** |
| Class Tests: | **Two (Minimum)** | Assignments: | **Two (Minimum)** |
| ESE Duration: | **Three Hours** | **Maximum Marks: 80** | **Minimum Marks: 28** |

**Course Objectives:**

1. To Design, Analyze and Interpret Combinational Circuits
2. To Design, Analyze and Interpret Sequential Circuits

**UNIT- I** **NUMBER SYSTEMS, CODES AND BOOLEAN ALGEBRA:** Representation of Signed Numbers and Binary Arithmetic in Computers.**Codes**: Weighted and Non-Weighted Codes, Sequential Codes, Self-Complementing Codes, Cyclic Codes; The 8421 BCD Code: BCD Addition; Excess-3 Code; The Gray Code: Binary to Gray and Gray to Binary Code Conversion; Error Detecting Codes: Parity, Check Sums, Block Parity, Five-bit Codes, The Biquinary Code, The Ring Counter Code; Error Correcting Code:7-bitHamming code; Alphanumeric Codes: The ASCII Code, The EBCDIC Code.**Boolean Algebra:** Logic Operations; Axioms and Laws of Boolean Algebra: Complementation Laws, AND Laws, OR Laws, Commutative Laws, Associative Laws, Distributive Laws, Redundant Literal Rule, Idempotence Laws, Absorption Laws, Transposition Theorem, Demorgan's Theorem; Duality; Reducing Boolean Expressions; Functionally Complete Sets of Operations; Boolean Functions and Their Representation.

**UNIT-II** **MINIMIZATIONTECHNIQUES:** Expansion of a Boolean expression to SOP form; Expansion of a Boolean expression to POS form; Two, Three & Four variable K-Map: Mapping and minimization of SOP and POS expressions; Completely and Incompletely Specified Functions- Concept of Don't Care Terms; Quine – McClusky Method (Up to 5 variable); Synthesis using AND-OR, NAND-NOR and XOR forms; Design Examples; Programmable Logic Devices: PAL, PLA's & PROMS.

**UNIT- III** **COMBINATIONAL CIRCUITS:** Adder &Subtractor: Half adder, Full adder, half subtractor, Full subtractor; Binary Parallel Adder; The Look Ahead Carry Adder; Serial Adder; BCD Adder; Code Converters; Parity Bit Generators/ Checkers; Comparators; Decoders: 3-Line to 8-Line Decoder, 8-4-2-1 BCD to Decimal Decoder, BCD to Seven Segment Decoder; Encoders: Octal to Binary and Decimal to BCD Encoder; Multiplexers: 2- InputMultiplexer,4-Input Multiplexer, 16-Input Multiplexer; Demultiplexers: 1-Line to 4-Line & 1-Line to 8- Line Demultiplexer; Applications of Multiplexers.

**UNIT-IV** **SEQUENTIAL CIRCUITS:** Flip-Flops: S-R Latch; Gated S-R Latch; D Latch; Edge Triggered Flip-Flops: S-R,D,J-K and T Flips-Flops; Master-Slave J-K Flip-Flop; Asynchronous Inputs; Shift Registers: SISO, SIPO, PISO,PIPO, Bi-Directional Shift Registers, Universal Shift register; Counters: Asynchronous Counters: Design of Asynchronous Counters; Effects of Propagation Delay in Ripple Counters; Synchronous Counters: Design of Synchronous Counters, 3-bit Synchronous Up counter, 3-bit Synchronous Down Counter,3-bit Synchronous Up-down Counter, Design of Modulo-9 Synchronous Counter, Design Of Synchronous BCD Counter, Design of Synchronous Mod-6 Counter; Shift Register Counters; Pulse Train Generators, Design of Sequence Generators; Design of Finite State Machine: Mealy and Moore Model.

**UNIT-V** **DIGITAL LOGIC FAMILIES:** Introduction; Simple Diode Gating and Transistor Inverter; Digital IC Specification Terminology; Logic Families: TTL: Open collector gates, TTL subfamilies; IIL; ECL; MOS Logic; CMOS Logic; Dynamic MOS Logic; Interfacing: TTL to ECL, ECL to TTL, TTL to CMOS, CMOS to TTL; Comparison Among Various Logic Families, Manufacturer's Specification.

**Text Books:**

1. FundamentalsofDigitalCircuits:A.AnandKumar,PHI

**Reference Books:**

1. DigitalFundamentals:Floyd&Jain:PearsonEducation
2. DigitalElectronics:A.P.Malvino:Tata McGraw Hill
3. DigitalCircuits&LogicDesign–LEE,PHI.
4. Digital Electronics-Principles and Integrated Circuits, A.K. Maini, 1sr Ed. Wiley India.

**Course outcomes:**

1. Students will be able to gain knowledge about various codes, employ Boolean algebra and circuit minimization techniques.
2. Students gain knowledge to interpret the operation of logic circuit such as adders, subtractors, multiplexers, flip-flops, shift registers and counters.
3. Students will be able to design asynchronous, synchronous sequential circuits and finite state machines.
4. Gain knowledge about various logic families and select a suitable one for a specific application.

# Chhattisgarh Swami Vivekanand Technical University, Bhilai

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|---|---|---|---|
| Name of program: | **Bachelor of Engineering** | | |
| Branch: | **Electronics & Instrumentation Engineering** | Semester: | **III** |
| Subject: | **Programming with 'C' Laboratory** | Code: | **327361(27)** |
| Total Lab Periods: | **36** | Batch Size: | **30** |
| Maximum Marks: | **40** | Minimum Marks: | **20** |

***List of Experiments:*** *(At leastTen experiments are to be performed by each student)*

1. Write a program to take the radius of a sphere as input and print the volume and surface and surface area of that sphere.
2. Write a program to take a 5-digit number as input and calculate the sum of its digits.
3. Write a program to take three sides of a triangle as input and verify whether the triangle is an isosceles, scalene or an equilateral triangle.
4. Write a program that will take 3 positive integers as input and verify whether or not they form a Pythagorean triplet or not.
5. Write a program to print all the Prime numbers between a given range.
6. Write a program to define a function that will take an integer as argument and return the sum of digits of that integer.
7. Write a program to define a macro that can calculate the greater of two of its arguments. Use this macro to calculate the greatest of 4 integers.
8. Write a program to define a recursive function that will print the reverse of its integer argument.
9. Write a program to print the sum of first N even numbers using recursive function.
10. Write a program to sort an array using Bubble sort technique.
11. Write a program that will take the elements of two integer arrays of 5 element each, and insert the common elements of both the array into a third array (Set intersection)
12. Write a program to take 5 names as input and print the longest name.
13. Write a program to define a structure Student that will contain the roll number, name and total marks of a student. The program will ask the user to input the details of 5 students and print the detail of all the students whose total marks is greater than a given value.
14. Write a program to define a union Contact that will contain the members Mobile no and Email id. Now define a structure Employee that will contain name, roll number, mode of contact (mob/e-mail) and a variable of type Contact as members. The program will ask the user to give the details of two Employees including mode of contact and the contact num/ Email. Print the details of both the Employees.
15. Write a program that will ask the user to input a file name and copy the contents of that file into another file.
16. Write a program that will take any number of integers from the command line as argument and print the sum of all those integers.

**Equipment/Machines/Instruments/Tools/Software Required:**

PCs, C-Compiler

**Recommended Book:**

Programming in ANSI 'C' – E. Balaguruswamy Tata Mc-Graw Hills

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|---|---|---|---|
| Name of program: | **Bachelor of Engineering** | | |
| Branch: | **Electronics & Instrumentation Engineering** | Semester: | **III** |
| Subject: | **Basic Electronics Laboratory** | Code: | **327362(27)** |
| Total Lab Periods: | **36** | Batch Size: | **30** |
| Maximum Marks: | **40** | Minimum Marks: | **20** |

***List of Experiments:*** *(At leastTen experiments are to be performed by each student)*

1. To draw the characteristics of a semi conductor diode and to find cut-in voltage, reverse resistance, static resistance and dynamic resistance.
2. To draw the characteristics of a zener diode
3. To design a half wave rectifier and to determine its efficiency and ripple factor.
4. To design a- full wave rectifier and determine the ripple factor and efficiency with filter.
5. To design a- full wave rectifier and determine the ripple factor and efficiency without filter.
6. To draw the characteristics of FET using BFW – 10
7. To draw the characteristics of CE configuration of a transistor amplifier.
8. To draw the characteristics of CB configuration of a transistor amplifier.
9. To draw the characteristics of CC configuration of a transistor amplifier.
10. To design a Zener regulator circuit and to find the regulation characteristics.
11. To draw the load line of a transistor amplifier under CE configuration.
12. To design and verify the self bias circuit operation.
13. To design and verify the voltage divider biasing circuit.
14. To verify the effect of emitter bypass capacitor.
15. To design a regulator circuit using Zener diode.

**Equipment/Machines/Instruments/Tools/Software Required:**
Circuit components, Breadboard, Hook-up wire, Power supply, CRO, Function generator

**Recommended Book:**
Laboratory Manual for Electronic Devices and Circuits, 4th Ed., David A. Bell, PHI

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|---|---|---|---|
| Name of program: | **Bachelor of Engineering** | | |
| Branch: | **Electronics & Instrumentation Engineering** | Semester: | **III** |
| Subject: | **Measurement & Instruments Laboratory** | Code: | **327363(27)** |
| Total Lab Periods: | **36** | Batch Size: | **30** |
| Maximum Marks: | **40** | Minimum Marks: | **20** |

***List of Experiments:*** *(At leastTen experiments are to be performed by each student)*

1. Measurement of Resistance by Kelvin's Double Bridge
2. Measurement of resistance by wheat stone bridge
3. Measurement of unknown induction coil by Maxwell's inductance capacitance Bridge
4. Measurement of unknown inductance of coil by Hay's bridge
5. Measurement of unknown capacitance by modifiable Desauty's bridge
6. Measurement of unknown inductance of coil by Anderson Bridge
7. Measurement of unknown capacitance by shearing bridge
8. Calibration of single phase energy meter using single phase wattmeter.
9. Study of Moving iron & Moving coil voltmeter
10. Study of single phase wattmeter
11. Study of single phase Energy meter
12. Potentiometer calibration
13. Study of 1 - φ power factor meter
14. Study of frequency meters
15. Study of moving iron & moving coil ammeter
16. Measurement of high Resistance using loss of charge method
17. Measurement of high Resistance using Megger Method

**Equipment/Machines/Instruments/Tools/Software Required:**

Bread Board, multimeter, CRO, connecting wires, function generator, patch cords, reisistors, capacitors, inductors, frequency generator, and power supply.

**Recommended Books:**

A. K. Sawhney, "Electrical & Electronics Measurement & Instrumentation", DhanpatRai Publication.

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| Name of program: | **Bachelor of Engineering** | | |
| Branch: | **Electronics & Instrumentation Engineering** | Semester: | **III** |
| Subject: | **Digital Electronic Circuits Laboratory** | Code: | **327364(27)** |
| Total Lab Periods: | **36** | Batch Size: | **30** |
| Maximum Marks: | **40** | Minimum Marks: | **20** |

***List of Experiments:*** *(At leastTen experiments are to be performed by each student)*

1. To verify the properties of NOR & NAND gates as universal building block.
2. Realization of Boolean expression using NAND or NOR gates.
3. To construct XOR gate using only NAND or NOR gates only.
4. To construct a half adder circuit and logic gates and verify its truth table.
5. To construct a full adder circuit and verify its truth table (using two XOR and 3 NAND gates).
6. To construct a half subtractor circuit by using basic gates and verify its truth table.
7. To construct a full subtractor circuits by using basic gates and verify its truth table.
8. To construct a circuit of 4 - bit parity checker & verify its truth table.
9. To construct a programmable inverter using XOR gates & to verify its truth table.
10. To design a comparator circuit & verify its truth table.
11. To construct a RS flip flop using basic & universal gates (NOT, NOR & NAND).
12. To construct a JK master slave flip flop & verify its truth table.
13. To verify the operation of a clocked SR flip flop and JK flip flop.
14. To construct a T & D flip flop using JK flip flop and verify its operations & truth table.
15. To verify the operation of a synchronous decade counter.
16. To verify the operation of various decoding and driving devices.
17. To perform the operation of BCD counter using 7490.

**Equipment/Machines/Instruments/Tools/Software Required:**

Circuit components, Power supply, CRO, Function generator

**Recommended Book:**

Fundamentals of Digital Circuits: A. Anand Kumar, PHI

# Chhattisgarh Swami Vivekanand Technical University, Bhilai

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|---|---|---|---|
| Name of program: | **Bachelor of Engineering** | | |
| Branch: | **Electronics & Instrumentation** | Semester: | **III** |
| Subject: | **Value Education** | Code: | **327365(46)** |
| No. Of Periods: | **2 Periods/Week** | Total Tutorial Periods: | **NIL** |
| **Maximum Marks:** | **40** | **Minimum Marks:** | **24** |

**Course Objectives:**

1. This course is designed to provide the importance of education with why, what & how.
2. To impart students with an understanding of fundamental humanitarian viewpoint and its outcomes.
3. To provide the knowledge about whole existence and its impact on values.
4. To bring the awareness about life long exercise so that they can fulfill their responsibility towards themselves, the family, the society, the planet.

**UNIT- I** **Aim of Education and Necessity for Value Education:** Education in values/wisdom/etc and education in traits/technologies/etc as the two fundamental strands of education; Answer to the frequently asked questions such as "Why to do studies", "What studies to do in overall", "How to do studies in a proper way", "How to think systematically and talk systematically"

**UNIT-II** **Humanitarian Viewpoint and Basic Human Objective:** Meaning and concept of happiness, Need for a fundamental viewpoint to judge things in all cases of human concerns, Proposal of the natural path of humanitarian coexistentialism; Consciousness development and its expression; Fundamental want of sustainable happiness in human being; Understanding the distinct activities and needs of self (I) and body in human being; Fundamental goal of human being; Sustainable-solution in individual (At the place of delusion); Sustainable-prosperity in family (At the place of poverty); Sustainable-cooperation in society (At the place of competition); Sustainable-coexistence in planet (At the place of struggle)

**UNIT- III** **Elements of Holistic and Systematic Perspective:** Need for study of fundamental information categories to develop holistic perspective; Particular-time actions and general-time laws; Need for fundamental information sequence to develop systematic perspective, Some examples for systematic study sequence

**UNIT-IV** **Elements of Society-friendly and Environment-friendly Goals:** Elements of Knowledge of whole existence; Elements of Knowledge of human being; Elements of fundamental Values and Wisdom; Value spectrum with reference to general relationships and particular relationships of the objects in nature; Elements of History and Contemporarity used to set current goals; Elements of Sciences and Techniques to formulate methods to achieve goals; Elements of Motoricity and Mattericity to make actions to execute the methods

**UNIT-V** **Lifelong Exercise for All-round Sustainability:** Collecting information for sustainability issues; Motivating people towards sustainable life-style; Ability to identify and develop appropriate technologies and management patterns for society-friendly and environment-friendly systems for production /protection/ utilization/ experimentation ; Ability to establish and execute the fundamental five-fold system in order to ensure sustainable peace-and-prosperity worldwide.

**Text Books:**

Value Education for Consciousness Development by Dr P B Deshmukh, Radha K Iyer, and Deepak K Kaushik (2nd Edition, 2012, ISBN: 978-81-924034-0-3)

**Reference Books:**


1. International Research Handbook on Values Education and Student Wellbeing by Terence Lovat, Ron Toomey, Neville Clement (Eds.), Springer 2010, ISBN: 978-90481-86747
2. Values Education and Lifelong Learning: Principles, Policies, Programmes by David N Aspin and Judith D Chapman (Eds.); Springer 2007, ISBN: 978-1-4020-6183-7
3. Fundamentals of Ethics for Scientists and Engineers by E G Seebaur and Robert L Berry, 2000, Oxford University Press