CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY, BHILAI

SCHEME OF TEACHING AND EXAMINATION

BE (Electronics &Telecommunication Engineering) IV Semester

Sl. No.	Board of Study	Code No.	Subjects	Period Per Week			Scheme of Exam			Total Marks	Credit L+(T+P)/2
							Theory/Practical				
				L	T	P	ESE	CT	TA		
1	Electronics & Telecom.	328451(28)	Numerical Analysis Using C	3	1	-	80	20	20	**120**	4
2	Electronics & Telecom.	328452(28)	Analog Communication	3	1	-	80	20	20	**120**	4
3	Electronics & Telecom.	328453(28)	Analog Electronics	3	1	-	80	20	20	**120**	4
4	Electronics & Telecom.	328454(28)	Microprocessor and Interfaces	3	1	-	80	20	20	**120**	4
5	Electronics & Telecom.	328455(28)	Signals and Systems	3	1	-	80	20	20	**120**	4
6	Electronics & Telecom.	328456(28)	Electromagnetic Fields & Transmission Lines	3	-	-	80	20	20	**120**	3
7	Electronics & Telecom.	328461(28)	Numerical Analysis Using C Lab	-	-	4	40	-	20	**60**	2
8	Electronics & Telecom.	328462(28)	Analog Communication Lab	-	-	4	40	-	20	**60**	2
9	Electronics & Telecom.	328463(28)	Analog Electronics Lab	-	-	4	40	-	20	**60**	2
10	Electronics & Telecom.	328464(28)	Microprocessor and Interfaces Lab	-	-	2	40	-	20	**60**	1
11	Humanities	328465(46)	Health, Hygiene & Yoga	-	-	2	-	-	40	**40**	1
12			Library	-	-	1	-	-	-	-	-
TOTAL				**18**	**5**	**17**	**640**	**120**	**240**	**1000**	**31**

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

Note (1): Duration of all theory papers will be of Three Hours.

Note (2): Industrial Training of six weeks is mandatory for B.E. student. It is to be completed in two parts. The first part will be in summer after IV semester after which students have to submit a training report which will be evaluated by the college teachers during B.E. V semester.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program:	**Bachelor of Engineering**		
Branch:	**Electronics &Telecommunication**	Semester:	**IV**
Subject:	**Numerical Analysis Using C**	Code:	**328451(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:
The basic objective of this course is to give the students an opportunity to hone their skills in problem solving using numerical methods and to acquaint the students with the potentials of numerical methods for solving various problems arising in engineering using C.

UNIT- I **INTRODUCTION TO C LANGUAGE :** History of C, Data types , Managing input and output, Arithmetic, Logical, Bitwise and shift operators in C, Precedence of operators, Type casting, Developing simple programs, Compilation, Executing a C program , Importance of C language, If statement, If-Else statements, Nested if-else, Else-If ladder, Conditional operator, Switch case construct.

UNIT-II **LOOP CONSTRUCTS AND FUNCTIONS:** Loop control structures, Nested loops, Break and continue statements, Arrays: Syntax and definition, One and multidimensional arrays, Reading and writing an array
FUNCTIONS: Declaring and defining functions, Scope and visibility of variables, Call by value.

UNIT- III **POINTERS, STRINGS & STRUCTURES:** Introduction to pointer data type, Pointers and arrays, Call by reference, Using library functions in programs, Preprocessor directives - #define, Recursion.
STRINGS: Reading and writing strings, Using library functions to manipulate strings, Array of strings.
STRUCTURES: Declaring and defining structure variables, Array of structures.

UNIT-IV **NUMERICAL SOLUTIONS OF ALGEBRAIC, TRANSCENDENTAL AND SIMULTANEOUS LINEAR EQUATIONS:** Bisection method, Regula-Falsi Method, Newton-Raphson Method, Secant Method, Birge-Vieta Method; Iterative Methods: Jacobi's, Guass-Siedal & Relaxation Method.

UNIT-V **NUMERICAL INTEGRATION:** Newton Cote's Quadrature Formula, Trapezoidal Rule, Simpson's Rule, Weddle's Rule.
NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS: Picard's Method, Taylor's Series Method, Euler's Method, Euler's Modified Method, Runge-Kutta Method, Predictor-Corrector method, Milne's Method.

Text Books:

1. Numerical Methods, B.S. Grewal, Khanna Publishers.
2. Numerical Methods, S.S. Shastri, PHI
3. Programming in ANSI C – E. Balaguruswamy Tata McGraw Hill
4. The C Programming Language, Brian W. Kernighan, Dennis M. Ritchie, PHI

Reference Books:

1. Numerical Methods For Scientific And Engineering Computation by M.K. Jain and S.R.K. Iyengar, New Age International
2. Let us C – Yashwant Kanetkar, BPB Publication

Course outcomes:

1. Student will learn the basic concepts of C programming language
   - Implement conditional statements
   - Declaring and defining functions, strings and structures.
2. The student should be able to find out the numerical solutions of algebraic, transcendental and simultaneous linear equations.
3. Use the numerical differentiation and integration and solve engineering problems which are characterized in the form of ordinary differential equations.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program:	**Bachelor of Engineering**		
Branch:	**Electronics &Telecommunication**	Semester:	**IV**
Subject:	**Analog Communication**	Code:	**328452(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:
To obtain familiarity and gain knowledge about various analog communication techniques including different modulation schemes, time-domain and frequency domain multiplexing, noise analysis.

UNIT- I **AMPLITUDE MODULATION:** Frequency translation, A method of frequency translation, Recovery of the baseband signal, Amplitude modulation, Maximum allowable modulation, The square law demodulator, Spectrum of a amplitude-modulated signal, Modulators and balanced modulators, Single-sideband modulation, Methods of generating an SSB signal, Vestigial-sideband modulation, Compatible single sideband, Multiplexing.
Radio Receivers: Receiver types: TRF receivers, Superhetrodyne receivers, Sensitivity and selectivity, Image frequency and its rejection.

UNIT-II **ANGLE MODULATION: PHASE & FREQUENCY MODULATION:** Angle modulation, Phase & frequency modulation, Relationship between phase and frequency modulation, Phase and frequency deviation, Spectrum of an FM signal: Sinusoidal modulation, Some features of the Bessel coefficients, Bandwidth of a sinusoidally modulated FM signal, Effect of the modulation index β on bandwidth, Spectrum of "constant bandwidth" FM, Phasor diagram for FM signals, Spectrum of Narrowband angle modulation: Arbitrary modulation, Spectrum of wideband FM (WBFM): Arbitrary modulation, Bandwidth required for a Gaussian modulated WBFM signal, FM generation: Parameter-variation method, An indirect method of frequency modulation (Armstrong system), Frequency multiplication, Frequency multiplication applied to FM signals, FM demodulators, Approximately compatible SSB systems, Stereophonic FM broadcasting. **FM receiver Block Diagram**.

UNIT- III **MATHEMATICAL REPRESENTATION OF NOISE:** Sources of noise, Frequency-domain representation of noise, Effect of filtering on the probability density of gaussian noise, Spectral components of noise, Response of a narrowband filter to noise, Effect of a filter on the power spectral density of noise, Superposition of noises, Mixing involving noise, Linear filtering, Noise bandwidth, Quadrature components of noise, Power spectral density of $n_c(t)$ and $n_s(t)$, Probability density of $n_c(t)$, $n_s(t)$ and their time derivatives.

UNIT-IV **NOISE IN AM SYSTEMS:** Amplitude modulation receiver, Advantage of super heterodyne principle: Single channel, Single sideband suppressed carrier (SSB-SC), Double sideband suppressed carrier (DSB-SC), Double sideband with carrier, Square law demodulator, The envelope demodulator.

UNIT-V **NOISE IN ANGLE MODULATED SYSTEMS:** An FM demodulator, Calculation of output signal and noise powers, Comparison of FM and AM, Pre-emphasis and de-emphasis, Single channel, Pre-emphasis and de-emphasis in commercial FM broadcasting, Phase modulation in multiplexing, Comparison between FM and PM in multiplexing, Effect of transmitter noise.

Text Books:

1. Principles of Communication Systems, Taub and Schilling, 2nd Edition., Tata McGraw Hill.(Unit-I,II,III,IV,V)
2. Electronic Communication Systems, George F Kennedy, Tata McGraw Hill. (Unit-I, II)
3. Communication Systems, Simon Haykins, Wiley India.

Reference Books:

1. Communication Systems Engineering, Proakis, 2nd Edition, Pearson Education.
2. Modern Digital and Analog Communication, B.P. Lathi, Oxford University Press.

Course outcomes:

1. The student will be able to draw spectral plots and visualize signals in frequency domain.
2. Understand the amplitude modulation process and effect of noise in AM systems.
3. Understand the angle modulation process and effect of noise in FM/PM systems.
4. Get the overview of transmitters and receivers for both AM and FM systems.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program:	**Bachelor of Engineering**		
Branch:	**Electronics &Telecommunication**	Semester:	**IV**
Subject:	**Analog Electronics**	Code:	**328453(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:

At the end of this course the students will learn and apply

- To understand Operating point calculations and working of BJTs at low and high frequencies.
- To study Frequency response of BJT.
- To study the design of power amplifiers.
- To understand the working of different types of feedback amplifiers.
- To understand the working of different types of oscillators.

UNIT- I **BJT AT LOW FREQUENCY**: Transistor as a two port device and its Hybrid Model: Models for CB, CE, CC configurations and their Interrelationship, Analysis and Comparison of the three Configurations. Classification of Amplifiers, Amplitude and Frequency, Linear analysis of Transistor Circuits. Miller's Theorem and its dual. Cascading transistor Amplifiers. Simplified Models and Calculation of CE and CC Amplifiers. The Common Emitter Amplifier with an Emitter Resistance. Cascode Amplifiers. High Input resistance Transistor Circuits.

UNIT-II **BJT AT HIGH FREQUENCY:** CE hybrid- model, Hybrid –π Conductances and Capacitances. Validity and parameter Variation, CE Short Circuit Current Gain, Current Gain with Resistive load. Frequency response of a single stage CE Amplifier, Gain-Bandwidth product, CC stage High frequencies.

UNIT- III **MULTISTAGE AMPLIFIERS**: Introduction, Distortion in Ampli1iers, Frequency Response, Step Response of an amplifier, Band Pass of Cascaded Stages. Coupling Types: Direct, RC and Transformer. RC Coupled Amplifier, Low Frequency response of an RC-coupled Stage, Effect of an Emitter bypass capacitor, High Frequency response of two cascaded CE Transistor stages.

Power Amplifiers: Class A Large signal amplifiers and Class B Amplifier: Conversion Efficiency and Distortion. Class AB Operation, Push pull amplifiers.

UNIT-IV **FEEDBACK AMPLIFIERS:** Classification, Feedback concept, Transfer gain with Feedback, Characteristics of Negative Feedback Amplifiers, Analysis of Input and output Resistance. Topologies: Method of Analysis of Feedback amplifiers, Voltage series Feedback, Voltage series Feedback pair, Current series, Current shunt and Voltage shunt feedback. Concept of positive Feedback.

UNIT-V **OSCILLATOR (BJT):** Barkhausen criterion for oscillation, Mechanism for start of oscillation and Stabilization of amplitude, Analysis of RC and LC oscillators. Sinusoidal oscillator: Phase shift oscillators, Wien Bridge oscillator, Resonant circuit oscillators, Colpittsand Hartley oscillator. Amplitude Frequency and Phase stability analysis of all Oscillators, General form of Oscillator Configuration. Crystal oscillator.

Text Books:

1. Integrated Electronics – Millman & Halkias, Tata McGraw Hill. (Unit I to V)
2. Microelectronics – Millman and Grabel, Tata McGraw Hill.
3. Electronic Devices & Circuits – Donald A Neaman, Tata McGraw Hill.

Reference Books:

1. Electronic devices and circuits- A.K. Maini & Varsha Agrawal, 1st Edition ,Wiley Publication.
2. Electronic Devices & Circuits – David A. Bell, PHI.
3. Microelectronic Circuits- Sedra and Smith, 5th Edition, Oxford University Press.

Course outcomes:

1. Student is able to understand ac analysis of BJT amplifier at Low and High frequencies.
2. Student gets knowledge of multistage amplifier and power amplifier.
3. The concepts of feedback used in amplifier is understood.
4. Student is able to understand the concepts of Oscillator.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program:	**Bachelor of Engineering**		
Branch:	**Electronics &Telecommunication**	Semester:	**IV**
Subject:	**Microprocessor & Interfaces**	Code:	**328454(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:
To introduce the architecture, interfacing and programming of 8085 microprocessor and various peripheral interfacing devices.

UNIT- I **MICROPROCESSOR ARCHITECTURE:** Introduction to Microprocessors, Architecture of 8085, Pin Configuration and Function, internal register & flag register, Generation of Control Signals: Bus Timings: Demultiplexing of address/ data bus; Fetch Cycle, Execute Cycle, Instruction Cycle, Instruction Timings and Operation Status, Timing Diagram.

UNIT-II **INSTRUCTION SET AND PROGRAMMING WITH 8085:** Instruction for Data Transfer, Arithmetic and Logical Operations, Branching Operation, Machine Cycle Concept, Addressing Modes, Instructions Format, Stacks, Subroutine and Related Instructions, Elementary Concepts of Assemblers, Assembler Directives, Looping and Counting, Software Counters with Time Delays, Simple Programs using Instruction Set of 8085, Debugging, Programs Involving Subroutines, Programs for Code Conversion e.g. BCD to Binary, Binary to BCD, Binary to Seven-Segment LED Display. Binary to ASCII, ASCII to Binary, Program for Addition Subtraction, Programs for Multiplication and Division of Unsigned Binary Numbers.

UNIT- III **DATA TRANSFER & DEVICE SELECTION:** Format of Data Transfer: Modes of Data Transfer: Type of I/O Addressing: Condition of Data Transfer: Microprocessor Controlled Data Transfer: Peripheral Controlled Data Transfer: Absolute and Linear Select Decoding.
Semiconductor Memories: Static & Dynamic RAM Cell, ROM, PROM, EPROM, EEPROM, UVPROM, Flash Memory and I/O Interfacing: Use of Decoders Selection, Memory organization and Mapping.

UNIT-IV **INTERRUPTS:** Restart Instruction, Hardware Implementation, Interrupt Processing, Multiple Interrupts and Priority Concepts, Interrupt Structure of 8085, Instructions related to interrupts, Pending Interrupts, Use of Interrupt and Handshaking Signals in Interfacing, Application of Interrupts and Illustrative Programs.

UNIT-V **ARCHITECTURE OF PERIPHERAL INTERFACING DEVICES:** Architecture, Pin Diagram and functioning of 8155/ 8156 (RAM), 8355/ 8755(ROM), 8255(PPI),Simple programs like Initialization and I/O operations of the ports, Timer operation of 8155, Programmable Internal Timer 8253/8254: Block Diagram, Pin Configuration, Modes, Initialization Instruction, Interfacing and Simple Programs to generate various types of signals. Architecture, Pin diagram, description and initialization of Keyboard and display interface (8279), USART (8251), 8259A Programmable interrupt Controller, Direct Memory Access (DMA), 8237 DMA Controller.

Text Books:

1. Microprocessor Architecture, Programming and Application - R.S. Gaonkar, Wiley Eastern
2. Digital Systems–From Gates to Microprocessors-Sanjay K. Bose, New Age International Publishers.
3. Digital Integrated Electronics – Taub and Schilling, Tata McGraw Hill.

Reference Books:

1. 8085Microprocessor Programming & Interfacing – N.K. Srinath, PHI.
2. Digital Computer Electronics–Malvino, Tata McGraw Hill.
3. Microprocessors: Theory and Applications–Intel and Motorolla, Rafiquuzzaman, PHI.
4. 0000 to 8085: Introduction to Microprocessor for Engineers and Scientists, Ghosh & Sridhar, PHI.

Course outcomes:

1. Gain knowledge about architecture of general purpose microprocessor.
2. Students will be able to describe physical and logical configuration of memory.
3. Demonstrate the ability to program the 8085 microprocessor.
4. Interface the 8085 microprocessor to the outside world.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program:	**Bachelor of Engineering**		
Branch:	**Electronics &Telecommunication**	Semester:	**IV**
Subject:	**Signals and Systems**	Code:	**328455(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 describe continuous time and discrete-time signals and systems.
2. Proficiently use various methods and approaches to solve problems with signals and systems prepared for upper-level courses in communication systems, control systems, and digital signal processing.

UNIT I **CLASSIFICATION OF SIGNALS AND SYSTEMS:** Representation of signals, Elementary signals, Basic Operation on Signals, Classification of Signals: Deterministic and random, periodic and non-periodic, Energy and power, Causal and non-causal, Even and odd Signals, Classification of Systems: lumped and distributed parameter, static and dynamic, causal and non-causal, linear and non-linear, time variant and time invariant, stable and unstable, invertible and non-invertible .

UNIT II **FOURIER REPRESENTATION OF SIGNALS:** Representation of Continuous time Fourier series(CTFS), Existence of fourier series, Trigonometric form of fourier series, Cosine representation, Wave symmetry, Exponential Fourier series, Fourier spectrum, Power representation using Fourier series, Gibbs phenomenon, Properties of CTFS.
Fourier Transform: Fourier transform of non-periodic functions, Magnitude and phase representation of Fourier transform, Existence of Fourier transform, Fourier transform of standard signals, Properties of continuous time Fourier transform, Fourier transform of periodic signals, Introduction to Hilbert transform.

UNIT III **Z TRANSFORM:** Introduction, Z transform of some common sequences, Z transform and region of convergence of finite duration sequences, Properties of region of convergence, Properties of Z transform, Inverse Z transform, Transform analysis of LTI systems, Stability and causality, Solution of difference equations using Z transform.

UNIT IV **LINEAR TIME INVARIANT SYSTEMS:** Response of a continuous time LTI System and Convolution integral using graphical method, Properties of continuous time LTI systems, Eigenfunctions of continuous time LTI systems, System described by Differential Equation, Response of a Discrete time LTI System and Convolution sum, Properties of discrete time LTI system, Eigenfunctions of Discrete Time LTI Systems, Systems described by difference equations.
Time and Frequency Characterization of Signals and Systems: The magnitude- Phase representation of Fourier transform, The magnitude – Phase representation of the frequency response of LTI systems: Linear and nonlinear phase, Group delay.

UNIT V **STATE SPACE ANALYSIS:** The Concept of state, State space representation of discrete time LTI Systems, State space representation of continuous time LTI Systems, Solution of state equations for discrete time LTI Systems,, Solution of state equations for continuous time LTI Systems.

Name of Text Books:

1. Signals & Systems: A. Anand Kumar, 2nd Edition, PHI. (Unit – I,II and III)
2. Signals & Systems: H. P. Hsu, McGraw-Hill Publication. (Unit- IV and V)
3. Signals & Systems: Alan Oppenheim & Alan Wilsky, S Nawab, PHI.(Unit-IV)
4.

Name of Reference Books:

1. Simon Haykin, Signals and Systems, 2nd Edition, Wiley India.
2. Signals, Systems and Communications: B.P. Lathi, BS Publications.

Course outcomes:

1. The student will be able to understand the classification of signals and systems.
2. Gain knowledge about the frequency domain analysis of continuous time and discrete time signals.
3. Use the Z-transform techniques to solve the system equations.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program:	**Bachelor of Engineering**		
Branch:	**Electronics &Telecommunication**	Semester:	**IV**
Subject:	**Electromagnetic fields and Transmission lines**	Code:	**328456(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:

- To impart the knowledge of electric, magnetic fields and the equations governing them.
- To show the existence of Electromagnetic waves under time varying case.
- To develop understanding of transmission lines.

UNIT- I **INTRODUCTION:** Orthogonal co-ordinate systems: Cartesian, Cylindrical and Spherical, Transformations between co-ordinate systems, Differential length, area and volume in different co-ordinate systems, Del Operator, Divergence, Curl- their physical interpretations, Laplacian operator, Coulomb's law, Electric field intensity, Field due to several charges.

UNIT-II **ELECTROSTATICS:** Gauss's law, Application of Gauss's law for some symmetrical charge distribution, Gauss's Divergence theorem; Electric potential, potential at any point due to discrete and distributed charge, Potential gradient, Relationship between E and V and Maxwell's equation, Dipole and flux lines; Energy density in electrostatic fields; Boundary conditions: dielectric-dielectric, Conductor-free space, Poisson's and Laplace's equations, Examples of the solutions of Laplace and Poisson's equations; Uniqueness theorem.

UNIT- III **MAGNETOSTATICS:** Biot-Savart's law and Magnetic fields and its calculation for different current distributions, Ampere's circuital law, Curl, Stokes' theorem; Magnetic flux and flux density, Scalar and Vector magnetic potentials.

Magnetic Force and Induction: Force on a moving charge, force on a differential current element, Force between differential current element, Force and torque on a closed circuit, Magnetic materials, magentization and permeability, Magnetic boundary conditions; Energy stored in magnetic field.

UNIT-IV **FIELD AND WAVES:** Faraday's law, Maxwell's modification of Ampere's law; Displacement current, Maxwell's equations in point form, Maxwell's equations in integral form, Source free wave equation, Uniform plane wave, Complex propagation constant, Wave propagation in air, Loss-less dielectric and lossy dielectric, Poynting theorem and flow of power; Wave polarization, Reflection and transmission of uniform plane wave at normal and oblique incidence.

UNIT-V **TRANSMISSION LINES:** Uniform transmission lines; transmission line equations and parameters; Solutions of transmission line equations, Lossless and distortion less transmission lines, Characteristic and input impedance of a transmission line, Shorted and open circuited transmission lines, Reflection coefficient, Standing wave ratio, Smith's chart and its application, Impedance matching: by Quarter wave line and by use of single stub.

Text Books:

1. Engineering Electromagnetics, William H. Hayt, Jr. John A. Buck, 7th Edition.,Tata McGraw Hill.
2. Antenna and Wave Propagation, K. D. Prasad, 3rd Edition. 1996, Satya Prakashan.

Reference Books:

1. Electromagnetic Fields, Jordan & Ballman, PHI.
2. Electromagnetic Field Theory and Transmission Lines, G. S. N. Raju, Pearson.

Course outcomes:

1. Students will be able to learn and apply concepts of orthogonal co-ordinate system and vector calculus to solve electric and magnetic field problems.
2. Know concepts about electric and magnetic fields; electromagnetic wave existence and its propagation in different medium.
3. Gain knowledge about signal transmission, parameters associated with transmission line; measure of various losses and techniques to reduce those losses.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program:	**Bachelor of Engineering**		
Branch:	**Electronics &Telecommunication**	Semester:	**IV**
Subject:	**Numerical Analysis Using Laboratory**	Code:	**328461(28)**
Total Lab Periods:	**36**	Batch Size:	**30**
Maximum Marks:	**40**	Minimum Marks:	**20**

List of Experiments: *(At least Ten 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. Writeaprogramtodefineafunctionthatwilltakeanintegerasargumentandreturnthesumof digitsofthatinteger.
7. Writea programto definea recursivefunctionthat willprintthereverseofitsintegerargument.
8. Writeaprogramthatwilltaketheelementsoftwointegerarraysof5elementeach,andinsertthe commonelementsofboththearrayintoa thirdarray(Setintersection).
9. Writea programto take5namesasinputandprintthelongest name.
10. 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 the students and print the details of all the students whose total marks is greater than a given value.
11. Write a program for solution of simultaneous linear algebraic equations by Gauss Seidal Method.
12. Write a program for numerical solution of ordinary differential equations by Runge-Kutta method.
13. Write a program for numerical solution of ordinary differential equations by Predictor-Corrector method.
14. Write a program to find roots of an equation using Newton Raphson Method.
15. Write a program for the computation of area of any section by Trapezoidal rule.
16. Write a program for the computation of area of any section by Simpson's rule.
17. Write a program to find the solution of Differential Equation by Euler's Method.
18. Write a program to find the solution of Differential Equation by Modified Euler's Equation

List of Equipments/Machine Required:

PCs, C-Compiler.

Reference Books:

1. Programming in ANSI C – E. Balaguruswamy Tata Mc-Gcraw Hill.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program:	**Bachelor of Engineering**		
Branch:	**Electronics &Telecommunication**	Semester:	**IV**
Subject:	**Analog Communication Laboratory**	Code:	**328462(28)**
Total Lab Periods:	**36**	Batch Size:	**30**
Maximum Marks:	**40**	Minimum Marks:	**20**

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

1. To study Amplitude Modulation on trainer kit.
2. To study Amplitude Demodulation on trainer kit.
3. To study Frequency Modulation and to trace the frequency modulated waveform on CRO using trainer kits.
4. To study Frequency Demodulation using trainer kits.
5. Design of a Frequency Demodulator Using PLL
6. To study a radio receiver having medium frequency reception.
7. To plot amplitude modulated signal and to calculate modulation index
8. To design and obtain characteristics of a mixer Circuit.
9. To generate SSB-SC signal and to study its characteristics.
10. To generate DSB-SC signal using Balanced Modulator and to study its characteristics.
11. To design a Ring Modulator and to study its characteristics.
12. To design a Square Law Detector using diode and to study its V-I characteristics.
13. To design and study an Envelope Detector.
14. To study the Time division multiplexing and de-multiplexing.
15. To study the Frequency division multiplexing and de-multiplexing.
16. To observe the effect of pre-emphasis and de-emphasis on a given input signal.

(Along with the above experiments, Simulators may be used to give idea about various communication techniques.)

List of Equipments/Machine Required:

Discrete Components, Function Generator, Power Supply, CRO, Communication trainer kits, Modulated Signal Generator, Transmission Line.COMMSIM software.

Reference Books:

1. Radio Communication by G.K Mithal, Khanna Publishers.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program:	**Bachelor of Engineering**		
Branch:	**Electronics &Telecommunication**	Semester:	**IV**
Subject:	**Analog Electronics Laboratory**	Code:	**328463(28)**
Total Lab Periods:	**36**	Batch Size:	**30**
Maximum Marks:	**40**	Minimum Marks:	**20**

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

1. To draw Static input characteristics curves of CE transistor and determine its h-parameter values.
2. To draw Static output characteristic curve CE transistor and determine its h-parameter values.
3. To draw Static input characteristic curve of CB transistor and determine its h-parameter values.
4. To draw Static output characteristic curve of CB transistor and determine its h-parameter values.
5. To design and study the frequency response of single stage CE transistor amplifier and determine its Bandwidth.(with and without bypass capacitor).
6. To find input and Output impedances of single stage CE amplifier.
7. To study the frequency response of RC coupled double stage CE transistor amplifier and determine its Bandwidth.
8. To study the frequency response of RC coupled double stage CE transistor amplifier with voltage feedback and determine its Bandwidth.
9. To study the frequency response of RC coupled double stage CE transistor amplifier with current feedback and determine its Bandwidth.
10. To Design Wein Bridge Oscillator and determine the frequency of Oscillation.
11. General study of pushpull audio power amplifier.
12. To Design RC phase shift oscillator and determine the frequency of Oscillation.
13. Study of various topologies of feedback amplifier.
14. Experiment with Darlington pair amplifier.

List of Equipments/Machine Required:
Circuit components, Power supply, CRO, Function generator, Multimeter, Breadboard.

Reference Books:

1. Lab Manual Of Electronic Devices by Paul B Zbar.
2. Lab Manual of Basic Electronics by David Bell.
3. Electronic Devices Systems and Applications by Robert Diffenderfer, Cengage learning.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program:	**Bachelor of Engineering**		
Branch:	**Electronics &Telecommunication**	Semester:	**IV**
Subject:	**Microprocessor & Interfaces Laboratory**	Code:	**328464(28)**
Total Lab Periods:	**36**	Batch Size:	**30**
Maximum Marks:	**40**	Minimum Marks:	**20**

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

1. **Reversing an Array:** A Block of 16 bytes are residing at locations starting from BLOCK : WAP to transfer the block in reverse order at locations starting from BLOCK 2.
2. **Sorting in Ascending Order:** A block (16 bytes are residing at locations starting from DATA : Write a program to arrange the word in the same location in ascending order.
3. **Binary Addition:** 16 bytes are residing at location starting from DATA WAP : to add all bytes and store the result location SUM and SUM + 1.
4. **BCD Addition:** 16 BCD NUMBER are residing at location starting from DATA WAP to add all bytes and store the result location SUM and SUM + 1.
5. **Multiplication:** Two bytes are residing at location DATA 1 and DATA 2 Write a program to multiply the two bytes and store the result at location PROD 1 and PROD 2.
6. **Binary to BCD:** A binary number is residing at location BIN > WAP to convert the binary number in to its equivalent BCD and store the result at BCD and BCD + 1.
7. **BCD to Binary:** A BCD number is residing at location BCD; Write a program to convert the BCD number into its equivalent binary and store the result at BIN.
8. **Multibyte Addition:** Two 10 bytes are residing at location starting from DATA 1 and DATA 2 respectively ,Write a program two add them up and store the result at location starting from RESULT (result space 11 bytes).
9. **Multibyte BCD Addtion:** Two 6 digits BCD numbers are residing at location starting from DATA 1 and DATA 2 respectively. Write a program to add them up and store the result at locations starting from RESULT (Result space 7 bytes).
10. **RST 6.5:** A block of 16 bytes is residing at location starting from ; DATA Reverse the block and store the bytes at REVERSE whenever the RST 6.5 key is pressed.
11. **Editing of ASCII String:** A string of ASCII characters is residing at locations starting from READ which contain "I $ WILL $ BE $ AN $ ENGINEER ". Edit string in such a way that it should contain "I $ will $ be $ Engineer ". Keep the edited string in the same locations. Product the string from further editing. ($ stands for a blank).
12. **Signed Binary Addition:** A block of 16 signed binary numbers is residing at locations NUMBERS. Add them up and store the result (in signed binary) at locations from RESULT.
13. **ASCII Code Conversion:** A string of 16 ASCII characters are residing at locations starting from DATA .The string consists of codes for capital letters, small letters and BCD digits (0-9). Convert the ASCII characters. In such a way that the codes for capital letters be converted into corresponding codes for small letters, codes for small letters into that of capital letters and codes for BCD digits into that of BCD numbers and store them at the same locations.
14. **Parity Check:** A block of 32 bytes is residing at DATA count the number (BCD) of times even and odd parity bytes are appearing consecutive memory locations. Keep the count at MATCH.
15. **Series Generation:** Two BCD numbers a and b are residing at locations DATA 1 and DATA 2 respectively. Write a program to form a series in BCD with the elements of a. a + 2b, a + 4b, a + 6b ……. Stop the generation of the series whenever any element of the series in BCD with the elements of the series exceeds (99). Store the result at locations starting from RESULT. Count the number (BCD) of elements in the series and store it at NUMBER.

List of Equipments/Machine Required:
8085 based microprocessor kit, MASM assembler, 8085 simulator, PCs.

Recommended Books:
8085 Microprocessor Programming & Interfacing – N.K. Srinath, PHI

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program:	**Bachelor of Engineering**		
Branch:	**Electronics & Telecommunication Engineering**	Semester:	**IV**
Subject:	**Health, Hygiene & Yoga**	Code:	**328465(46)**
No. Of Periods:	**2 Periods/Week**	Total Tutorial Periods:	**NIL**
Maximum Marks:	**40**	**Minimum Marks:**	**24**

Course Objectives:

1. To provide understanding the importance of health.
2. To provide insight into the hygiene aspect & quality of life.
3. To study the concepts of various medical therapy.
4. To practice the various yogasans.
5. To provide knowledge about common diseases and its cure through yagasans and pranayam.
6. To develop concentration through various methods.

UNIT- I **HEALTH & HYGIENE:** Concept of health, Physical health and mentall health and wellbeing and how to achieve these, longevity and how to achieve it, concept and common rules of hygiene, cleanliness and its relation with hygiene; Overeating and underrating, amount of food intake required, intermittent fasting; adequate physical labour, sleep; consumption of junk fast food vs nutritious food; fruits, vegetables cereals and qualities of each of these.

UNIT-II **INTRODUCTORY KNOWLEDGE OF COMMON STREAMS OF MEDICINAL CURE:** History, development, basic concepts, modes of operation of Alopathy, Ayurved, Homoeopathy, Biochemic, Unani, Siddha, Accurpressure, Accupunture, Naturopathy, Yogic and Herbal system of medicines, Introduction of Anatomy and Physiology concerned.

UNIT- III **YOGASANS:** Meaning and concept of Yoga, Yogasans and its mode of operation, How to perform Yogasans, Common Yogasans with their benefits, such as, Padahastasan, Sarvangasan, Dhanurasan, Chakrasan, Bhujangasan, Paschimottasan, Gomukhasan, Mayurasan, Matsyasan, Matsyendrasan, Pawanmuktasan, Vajrasan, Shalabhasan, Sinhasan, Shashankasan, Surya Namaskar, Halasan, Janushirasan, Utshep Mudra.

UNIT-IV **YOGASANS FOR COMMON DISEASES:** From Yogic MateriaMedica with symptoms, causes, asans and herbal treatment.

- **Modern silent killers:** High blood pressure, diabetes and cancer, causes and cure; Common health problems due to stomache disorders, such as, indigestion, acidity, dycentry, piles and fissures, artheritis, its causes, prevention and cure.
- **Asans for relaxation:**Shavasan, Makarasan, Matsyakridasan, Shashankasan.
- **Asans to increase memory and blood supply to brain:**Shirshpadasan, Shashankasan.
- **Asans for eye sight:**Tratak, NetiKriya .
- **Pranayam:** Definition and types: NadiShodhan, Bhastrik, Shitakari, Bhramari useful for students.

UNIT-V **CONCENTRATION:** Concentration of mind and how to achieve it. Tratak (त्राटक), Concentration on breath, Japa (जप), Ajapajap (अजपाजप), internal silence (अन्तर्मौन), visualization in mental sky (चिदाकाश धारणा), Concentration on point of light (ज्योति ध्यान), Concentration on feeling (भाव ध्यान), Concentration on figure (मूर्त्त ध्यान).

Text Books:

Health, Hygiene & Yoga,Dr P B Deshmukh, Gyan Book Pvt Ltd. New Delhi.

Reference Books:

(1) Yogic MateriaMedica

(2) Asan, Pranayam and Bandh.