

MATS School of Engineering & Technology

**MATS University
Raipur**



Syllabus Scheme
(3rd Semester)
For
Bachelor of Engineering
In
Computer Science & Engineering

Subject Code For School of Engineering & Tech. Deptt.

3rd Semester (Computer Science)

S.No.	Subject Code	Subject Name
1	BE320	Engineering Mathematics-III
2	BE321	Problem Solving and Logic Building using C
3	BE322	Digital Logic Design
4	BE323	Computer Organization & Architecture
5	BE324	Electronic Circuits & Network Theory
6	BE325	Web Technology
7	BE326	Programming with C Lab
8	BE327	Logic Design Lab
9	BE328	Electronic Circuits & Network Lab
10	BE329	Web Technology Lab



MATS School of Engineering & Technology
MATS University, Raipur
Scheme of Teaching & Examination
IIIrd Semester
Computer Science & Engineering



S. No.	Course code	SUBJECT	Periods per week		Evaluation Scheme		Total Marks
			L	P	IM	ESE	
THEORY							
1	BE320	Engineering Mathematics-III	5	0	30	70	100
2	BE321	Problem Solving and Logic Building using C	5	0	30	70	100
3	BE322	Digital Logic Design	5	0	30	70	100
4	BE323	Computer Organization & Architecture	5	0	30	70	100
5	BE324	Electronic Circuits & Network Theory	5	0	30	70	100
6	BE325	Web Technology	5	0	30	70	100
PRACTICAL							
7	BE326	Programming with C Lab	0	3	20	30	50
8	BE327	Logic Design Lab	0	3	20	30	50
9	BE328	Electronic Circuits & Network Lab	0	3	20	30	50
10	BE329	Web Technology Lab	0	3	20	30	50

L-Lecturer, P-Practical, ESE- End Semester Examination, IM-Internal Marks

ENGINEERING MATHEMATICS

BE320

UNIT I

FOURIER SERIES

Periodic functions, Euler's formula, Dirichlet conditions, Change of interval, Even and Odd functions, Half range Fourier series, Parseval's identity, Practical harmonic analysis.

UNIT II

PARTIAL DIFFERENTIAL EQUATION

Formation, Solution of PDE by direct integration method, Linear PDE of first order, Homogeneous linear equations with constant coefficients, Non-homogeneous linear P.D.E., Solution of PDE by method of separation of variables.

UNIT III

COMPLEX VARIABLES

(Limit and derivative, Analytic functions, Cauchy-Riemann equations, Harmonic functions, Flow problems, Complex integration, Cauchy's theorem, Cauchy integral formula, Taylor & Laurent series, Singularities, Residues, Cauchy's residue theorem, Evaluation of real definite integrals.

UNIT IV

NUMERICAL SOLUTION OF ORDINARY & PARTIAL DIFFERENTIAL EQUATIONS

Numerical solution of ODE's by Taylor's series method, Picard's method, Euler's method, Euler's modified method, Runge-Kutta methods, Predictor-corrector methods-Milne's method, Adams-Bashforth method.

Numerical solution of PDE's, Classifications of second order PDE, Elliptic equations, solution of Laplace equations, solution of Poisson's equation, Solution of elliptic equation by relaxation method, Parabolic equations, Solution of one dimensional and 2-D heat equations, Hyperbolic equation, Wave equations.

UNIT V

NUMERICAL SOLUTION OF ALGEBRAIC, TRANSCENDENTAL AND SIMULTANEOUS EQUATIONS DIFFERENTIAL:

Numerical solution of algebraic and transcendental equations: Newton-Raphson method, Secant method, Birge-Vieta method, Bairstow method, Numerical solution of simultaneous linear equations: Direct methods-Gauss elimination, Gauss-Jordan & Crout's Triangularisation method. Iterative methods-Jacobi's, Gauss-Seidel & Successive over Relaxation method.

Text Books:-

1. Advanced Engineering Mathematics by Kreyszig Erwin ; Wiley Eastern, New Delhi
2. Higher Engineering Mathematics by BS Grewal : Khanna Publishers, New Delhi.
3. Numerical Solutions of Differential Equations by NK Jain ; Prentice Hall, Delhi.
4. Differential Equations by Sharma and Gupta ; Krishna Prakashan Media (P) Ltd., Meerut.
5. Peter V. O'Neil, Advance Engineering Mathematics Thomson (Cengage) Learning, 2007.
6. Jain, Iyenger & Jain, Numerical Methods for Scientific and Engineering Computation, New Age International, New Delhi , 2003.
7. J.N. Kapur, Mathematical Statistics, S. Chand & company Ltd., 2000

Reference Books :-

1. R.K. Jain & S.R.K. Iyenger, Advance Engineering Mathematics, Narosa Publication House, 2002.
2. Chandrika Prasad, Advanced Mathematics for Engineers, Prasad Mudralaya, 1996.
3. E. Kreysig, Advanced Engineering Mathematics, John Wiley & Sons, 2005.
4. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 2005.
5. Devi Prasad, An introduction to Numerical Analysis, Narosa Publication house, New Delhi 2006.
6. T. Veerajan & T. Ramchandrandran, Theory & Problems in Numerical Methods, TMH, New Delhi, 2004.
7. S.P.Gupta, Statistical Methods, Sultan and Sons, New Delhi, 2004.
8. Devore, Probability and Statistics, Thomson(Cengage) Learning, 2007.
9. Walpole, Myers, Myers & Ye, Probability and Statistics for Engineers & Scientists, Pearson Education, 2003.
10. Advanced Engg.Mathematics by R.K. Jain and S.R.K. Iyengar – Narosa Publishing House.
11. Applied Mathematics by P.N.Wartikar & J.N. Wartikar. Vol- II– Pune Vidyarthi Griha Prakashan,Pune.
12. Applied Mathematics for Engineers & Physicists by Louis A. Pipes- TMH.

PROBLEM SOLVING AND LOGIC BUILDING USING C BE321

UNIT I

ELEMENTS OF C LANGUAGE

Origin of C, Features & Characteristic of C, C Compiler, Character Set, Keywords, Identifiers, Constants, Variables, Input/ Output Statements, Basic Data Types, Operators and Expressions, Tools for Problem Solving: Problem Analysis, Flowchart, Algorithm Development. Top-Down Program Design, Structured Design Approach, Basic structure of C programs, A simple C Program.

UNIT II

CONTROL FLOW CONSTRUCTION

Decision making and branching: Simple if statement, if else statement, Nesting of if-else statement, else - if Ladder, Switch statement, Operator, Goto statement, Decision making and looping, While statement, Do-While statement, For statement, Jumps in loops, Break and Continue statement.

UNIT III

DEFINING AND MANIPULATING ARRAYS

One Dimensional Arrays: Declaration of Arrays, Initialization of Arrays, Reading and Writing of integer, Real and Character arrays, Sorting and Searching in Arrays, Multi Dimensional Arrays, Handling of Character Strings.

UNIT IV

USER DEFINED FUNCTIONS

Syntax of Function, Calling functions, Actual & Formal Arguments, Categories of Functions, Function prototype, Scope Rules: Local & Global variables, Recursion, Recursion vs. iteration, Passing Arguments: call by values & call by reference, Passing array to function.

Structures: Declaration and initialization of Structure, Array of structures, Array within structure, structure within structure, Structures and functions, Introduction to unions.

UNIT V

POINTER DATA TYPE AND ITS APPLICATION

Pointer Operator, Pointer Expression, Initialization of pointers, Pointer Arithmetic, Pointer and Function Arguments, Pointer to function, Pointer and Arrays, Pointers and String, Arrays of Pointers, Pointers to Pointers.

Files in C: Defining and Opening a file, Closing a file, Input/ Output operations on files, Error handling during I/O operations, Random access to files.

Text Books:

1. Programming in C by Byron Gottfrid (Schoum's series outline TMH)
2. Programming in C By E. Balagurusamy (TMH)

Reference Books:

1. The C programming Language by Dennis M Ritchie and Kernighan (PHI)
2. Let us C by Yashwant Kanetkar (BPB Publication)
3. C for all by S. Thamarai Selvin & R. Murugesan (Anuradha Agencies)
4. Programming in C by Ghosh (PHI)
5. Computer Programming in C by V. Rajaraman (PHI)

DIGITAL LOGIC DESIGN

BE322

UNIT I

INTRODUCTION

Characteristics of digital system, Types of Digital circuits, Number system: Direct conversion between bases Negative numbers & BCD and their arithmetic's, Boolean Algebra, Minimization of Boolean Functions: K Map upto 6 variable and multiple output circuits Error Detecting & Correcting codes, Hamming & Cyclic codes.

UNIT II

COMBINATIONAL LOGIC CIRCUITS

Design Procedure, Adders, Subtractors & Code conversion, Multiplexers/ Demultiplexers, Encoder / Decoders, Decimal Adders & Amplitude Comparators, ROM as Decoder, PLA & PAL.

UNIT III

SEQUENTIAL LOGIC CIRCUITS

Flip –Flops and their conversions, Analysis and Synthesis of synchronous sequential circuit, Excitation table, State table & State diagram. Design of Synchronous Counters, Shift Registers and their Application.

UNIT IV

LOGIC FAMILIES

Diode, BJT & MOS as a switching element concept of transfer characteristics, Input characteristics and Output characteristics of logic gates, Fan-in, Fan-out, Noise margin, Circuit concept and comparison of various logic families: TTL, IIL, ECL, NMOS, CMOS Tri-state logic, Open collector output, Interfacing between logic families, Packing density, Power consumption & Gate delay.

UNIT V

MEMORIES

Sequential, Random Access, NMOS & CMOS Static and Dynamic Memory Elements, One and Multi Dimensional selection arrangement, Read only memories, Formation of Memory banks.

STATIC AND DYNAMIC HAZARD: Gate delay, Generation of spikes, Determination of Hazard in Combinational circuits, Fault detection methods: Fault Table & Path sensitizing methods.

Text Books:

1. Digital Design by M Moris Mano, 2n d Edn.PHI
2. Introduction to Digital Microelectronic Circuits, by Gopalan, TMH

Reference Books:

1. Switching Circuit & Logic Design by Hill & Peterson, Wiley
2. Digital Circuit & Logic Design, by Holsworth.

COMPUTER ORGANIZATION & ARCHITECTURE

BE323

UNIT I

Central processor organizations, Basic building blocks, Bus organized computer memory, Address structure, Memory data register, Program Counter, Accumulator, Instruction register, Instruction field, Address field, Micro-operations, Register transfer languages, Instruction fetch, Decoding and Execution, Instruction formats and Addressing modes.

UNIT II

Control unit organization, Instruction Sequencing, Instruction interpretation, Hardwired control & micro-programmed control organization, Control memory, Address sequencing micro-instruction formats, Micro-program sequencer, Micro-programming, Bit slicing in AHPL, Emulation.

UNIT III

Arithmetic processor design, Addition and Subtraction Algorithm, Multiplication algorithm, Division algorithm, Processor configuration, Design of control unit and floating point arithmetic.

UNIT IV

Input-Output organization, Programmed I/O, I/O addressing, I/O instruction, Synchronization, I/O interfacing, Standard I/O interfaces interrupt mechanism, DMA, I/O processors and data communication.

UNIT V

Memory Organization and Multiprocessing, Basic concepts and terminology, Memory hierarchy, Semiconductor memories (RAM, ROM), Virtual memory, Associative memory, Cache memory, Cache mapping techniques, Memory allocation and management policies, Structure of Multiprocessors, Parallel processing, Pipeline processing.

Reference Books:-

1. Computer Organization and architecture- William Stallings, Macmillan Publishing Company, Fourth Edition.
2. Computer Architecture – Morris Mano, PHI Publication.
3. Advanced Computer Architecture: A System Design Approach- Kain, PHI Publication.
4. Computer Systems Organization & Architecture – John D Carpinelli, Addison-Wesley.
5. Computer Organization, John P.Hayes (McGraw Hill)

ELECTRONIC CIRCUITS & NETWORK THEORY

BE324

UNIT I

Review of equivalent circuit for semi conductor devices (BJT, FET etc) classification of amplifiers , Voltage amplifier , Current amplifiers , Amplifier characteristics, BW, Gain , Input Impedance, Output Impedance, Distortion etc. Transistor Biasing and Stabilization, Bias compensation, Thermal Runaway.

UNIT II

Switching Characteristics of BJT and FET, Linear and Non-linear wave shaping circuit, Bistable, Monostable and Astable multi-vibrators, RC integrators and Differentiators, Clipper and Clamper circuits.

UNIT III

Classification of Amplifiers, Operational Amplifiers (OP-AMP), Inverting & Non inverting mode comparators, Zero Crossing Detector, VF and FV converter, Rectifier circuit using op-amp, 555 Timer and it's application.

UNIT IV

Circuit Elements, KVL, KCL, Elementary Graph Theory, Incidence Matrix, Cut-Set, Tie- Set, Network Theorems, Superposition, Thevenin's, Norton's, Reciprocity, Max. Power Transfer, Millman's, Tellengens Theorem, and Magnetically Coupled Circuits.

UNIT V

Differential Equations, First & Second order system, Time constant, Initial Conditions, Laplace Transform & its application in circuit analysis, Initial & Final value Theorem, Network Functions, and Two Port Network Parameters.

Reference Books:-

1. Integrated Electronics by Milliman & Halkias Mc-Grow Hill Publication
2. Micro-Electronics Circuit by Sedra Smieth Oxford University Press.
3. Network Analysis by Van Valkenburg PHI publication
4. Electronic Devices and Circuits by Boylsted

WEB TECHNOLOGY

BE325

UNIT I

Introduction and Web Development Strategies, History of Web, Protocols governing Web, Creating Websites for individual and Corporate World, Cyber Laws Web Applications, Writing Web Projects, Identification of Objects, Target Users, Web Team, Planning and Process Development.

UNIT II

HTML, XML and Scripting List, Tables, Images, Forms, Frames, CSS, Document type definition, XML schemes, Object Models, Presenting XML, Using XML Processors: DOM and SAX, Introduction to Java Script, Object in Java Script, Dynamic HTML with Java Script.

UNIT III

Java Beans and Web Servers: Introduction to Java Beans, Advantage, Properties, BDK, Introduction to EJB, Java Beans API Introduction to Servlets, Lifecycle, JSDK, Servlet API, Servlet Packages: HTTP package, Working with Http request and response, Security Issues.

UNIT IV

JSP: Introduction to JSP, JSP processing, JSP Application Design, Tomcat Server, Implicit JSP objects, Conditional Processing, Declaring variables and methods, Error Handling and Debugging, Sharing data between JSP pages- Sharing Session and Application Data.

UNIT V

Database Connectivity

Database Programming using JDBC, Studying Javax.sql.*package, accessing a database from a JSP page, Application-specific Database Action, Developing Java Beans in a JSP page, introduction to Struts framework.

Text Books:-

1. Burdman, "Collaborative Web Development" Addison Wesley.
2. Chris Bates, "Web Programming Building Internet Applications", 2nd Edition, WILEY, Dreamtech.
3. Joel Sklar, "Principal of web Design" Vikash and Thomas Learning
4. Horstmann, "CoreJava", Addison Wesley.
5. Herbert Schildt, "The Complete Reference:Java", TMH.
6. Hans Bergsten, "Java Server Pages", SPD O'Reilly
7. Digital Design by M Moris Mano, 2nd Edn.PHI
8. Introduction to Digital Microelectronic Circuits, by Gopalan, TMH

Reference Books:-

1. Switching Circuit & Logic Design by Hill & Peterson, Wiley
2. Digital Circuit & Logic Design, by Holsworth.

PROGRAMMING WITH C LAB

BE326

List of programs to be executed (but should not be less than 10):

- 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 details 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 E-mail 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/ E-mail. 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.
- 17 Write a program to process sequential file for payroll data.
- 18 Write a program to process random file of library data.

List of Equipments/Machine Required:

PCs, C-Compiler

Recommended Books:

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

DIGITAL LOGIC DESIGN LAB

BE327

Experiments to be performed

1. Bread-board implementation of various flip-flops.
2. Bread-board implementation of counters & shift registers.
3. Determination of Delay time and NAND, NOR, Ex-OR, AND & OR Gates.
4. Transfer characteristics of TTL inverters & TTL Schmitt Trigger inverter.
5. Transfer characteristics of CMOS inverters series and CD40 series and estimation of Gate delay of CD40 series CMOS inverter.
6. Monoshot multivibrators using 74121 and 74123.
7. Clock circuit realization using 555 and CMOS inverter and quartz crystal.
8. Adder/ subtractor operation using IC7483 4 bit/ 8 bit.
9. Demultiplexer / Decoder operation using IC-74138.
10. Modulo N counter using programmable counter 74190.

Equipments required

1. Logic gate trainer
2. Digital ICs Trainer
3. Various ICs 7400,7402,7404,7408,7432,7486,74138,74151,74155 etc.

Recommended Books:

1. M.M. Mano : “Digital logic and computer design”, PHI.
2. Floyd : “Digital fundamentals”, UBS.

ELECTRONIC CIRCUITS & NETWORK LAB BE328

Experiments to be performed (minimum 10 experiments)

1. To draw the characteristics of a semiconductor diode and to find cut-in voltage, reverse resistance, static resistance and dynamic resistance.
2. To draw the characteristics of FET using BFW – 10
3. To draw the characteristics of CE configuration of a transistor amplifier.
4. To draw the characteristics of CB configuration of a transistor amplifier.
5. To draw the characteristics of CC configuration of a transistor amplifier.
6. To design a Zener regulator circuit and to find the regulation characteristics.
7. To draw the load line of a transistor amplifier under CE configuration.
8. To design and verify the self bias circuit operation.
9. To design and verify the voltage divider biasing circuit.
10. To verify the effect of emitter bypass capacitor.
11. To design a regulator circuit using Zener diode.
12. Verification of principle of superposition with dc and ac sources
13. Verification of Thevenin, Norton and Maximum power transfer theorems in ac circuits
14. Verification of Tellegen's theorem for two networks of the same topology
15. Determination of transient response of current in RL and RC circuits with step voltage input
16. Determination of image impedance and characteristic impedance of T and Π networks, using O.C. and S.C. tests

List of Equipments/Machine Required:

Circuit components, Breadboard, Hook-up wire, Power supply, CRO, Function generator

Recommended Books:

1. Laboratory Manual for Electronic Devices and Circuits, 4th Ed., David A. Bell, PHI

WEB TECHNOLOGY LAB (HTML/DHTML)

BE329

EXPERIMENTS TO BE PERFORMED (minimum 10 experiments)

- 1 Design a HTML page describing your profile in one paragraph. Design in such a way that it has a heading, a horizontal rule, three links and your photo also write three HTML documents for the links.
- 2 Design HTML page describing your academic career. The page will tell about the degrees, Institutions and your hobbies. Add some lists too.
- 3 Design HTML page demonstrating Concept Of Internal Hyper-link
- 4 Design HTML page which gives the list of grocery Items by using Ordered List , List consist of Roman no, A,B.... and so on.
- 5 Design HTML page which gives the list of grocery Items by using Unordered List bullets are of form disc, square and circle.
- 6 Design a HTML page for partitioning browser window in frames display the different pages in partitioned windows.
- 7 Design HTML page to partition window, Design in such a way that link clicked in on page can display the corresponding pages in other window.
- 8 Design a HTML page on your native place.
- 9 Design a HTML page on your friends. List your friends; each friends name is a link. Prepare separate HTML document on each friend and call them in appropriate link.
- 10 Design HTML page listing popular car companies. For each company prepare a sub list showing various brands of cars it offers.
- 11 Design a HTML page for reserving a room in a Hotel.
- 12 Design a HTML form to reserve a Railway ticket.
- 13 Design a HTML form to see the result for a candidate when the results are published on the web.
- 14 Design a HTML form to find the railway fare from one place to another.
- 15 Design a HTML form to find out the balance for a mobile phone customer as on today.

Recommended Books:-

1. HTML Complete Reference- Tata McGraw hill
2. HTML and XML: An Introduction NIIT, Prentice-Hall of India
3. Building Enhanced HTML Help with DHTML and CSS by Jeannine M.E.Klien. Pearson Education
4. HTML for the World Wide Web, Fifth Edition, with XHTML and CSS
5. Visual Quick Start Guide 5th Edition Elizabeth Castro, Pearson Education Sam's Teach Yourself HTML & XHTML in 24 Hours 6th Edition Dick Oliver, Michael Morrison, Pearson Education