

AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

Department: Computer science & Egg.

Subject Code	Subject Name	Credits	Maximum marks Allotted					Duration of Exam.		
			Theory			Practical		Total	Theory	Practical
			Major	Minor	Sessional.	End Sem	Lab Work			
TBCS - 301	Mathematics iii	5(3+1+1)	50	20	30	-	-	100	3 hr	-

COURSE OBJECTIVE- The objective of this course is to fulfill the needs of Engineers to understand the Applications of Fourier Series, Fourier & Laplace Transforms and Statistical Techniques in order to acquire Mathematical knowledge and to Solving a wide range of Practical Problems Appearing in the CS/IT/EC discipline of Engineering.

syllabus

Fourier Series: Fourier Series for Continuous & Discontinuous Functions, Expansion of odd and even periodic functions, Half-range Fourier series, Complex form of Fourier Series.

Integral Transforms:

Fourier Transform: Complex Fourier Transform, Fourier Sine and Cosine Transforms, Applications of Fourier Transform in Solving the Ordinary Differential Equation.

Laplace Transform: Introduction of Laplace Transform, Laplace Transform of elementary Functions, Properties of Laplace Transform, Change of Scale Property, First and Second Shifting Properties, Laplace Transform of Derivatives and Integrals. Inverse Laplace Transform & its Properties, Convolution theorem, Applications of Laplace Transform in solving the Ordinary Differential Equations.

Random Variables: Discrete and Continuous Random Variables, Probability Function, Distribution Function, Density Function, Probability Distributions, Mean and Variance of Random Variables.

Distribution: Discrete Distributions- Binomial & Poisson Distributions with their Constants, Moment Generating Functions, Continuous Distribution- Normal Distribution, Properties, Constants, Moments.

COURSE OUTCOMES-

- Find the Fourier series representation of a function of one variable.
- Find the solution of the wave, diffusion and Laplace equations using the Fourier series.
- Find the Laplace and Fourier transforms of functions of one variable.
- Solve an initial value problem for an nth order ordinary differential equation using the Laplace transform.
- Solve a Cauchy problem for the wave or diffusion equations using the Fourier Transform.

Reference:

1. Probability & Statistics by G Shanker Rao, University Press.
 2. Mathematical Statistics by George R., Springer
 3. Erwin Kreyszig: Advanced Engineering Mathematics, Wiley India.
 4. H C Taneja: Advanced Engineering Mathematics, I.K. International Publishing House Pvt. Ltd.
 5. S S Sastri: Engineering Mathematics, PHI
 6. Ramana, B.V.: Advance Engg. Mathematics, TMH New Delhi
 7. Engineering Mathematics By Samnta Pal and Bhutia, Oxford Publication
 8. Probability and Statistics in Engineering, W.W. Hines et. al., Wiley India PVT Ltd.
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TBCS - 302	Electronic Devises & circuits	5(3+1+1)	50	20	30	25	25	150	3 hr	2 hr

Course Objective: A working knowledge of the characteristics of pn junction diodes, bipolar junction transistors (BJT's) and Field Effect Transistors (FET's). Different techniques used for the analysis of basic electronic circuits. Design of basic electronic circuits using these devices.

Syllabus

Unit I

Semiconductor devices, theory of P-N junction, temperature dependence and break down characteristics, junction capacitances. Zener diode, Varactor diode, PIN diode, LED, Photo diode, Transistors BJT, FET, MOSFET, types, working principal, characteristics, and region of operation, load line biasing method. Transistor as an amplifier, gain, bandwidth, frequency response, Type of amplifier.

Unit II

Feedback amplifier, negative feedback, voltage-series, voltage shunt, current series and current shunt feedback, Sinusoidal oscillators, L-C (Hartley-Colpitts) oscillators, RC phase shift, Wien bridge, and Crystal oscillators. Power amplifiers, class A, class B, class A B, C amplifiers, their efficiency and power Dissipation.

Unit III

Switching characteristics of diode and transistor turn ON, OFF time, reverse recovery time, transistor as switch, Multivibrators, Bistable, Monostable, Astable multivibrators. Clippers and clampers, Differential amplifier, calculation of differential, common mode gain and CMRR using hparameters.

Unit IV

Operational amplifier characteristics, slew rate, full power bandwidth, offset voltage, bias current, application ,inverting , non inverting amplifier , summer, differentiator, integrator, differential amplifier , instrumentation amplifier, log and antilog amplifier , voltage to current and current to voltage converters , comparators Schmitt trigger .

Unit V

Introduction to IC, Advantages and limitations, IC classification, production process of monolithic IC, fabrication of components on monolithic IC, IC packing, general integrated circuit technology, photolithographic process, unipolar IC's, IC symbols.

Course outcomes:

- Understand the diode and transistor characteristics.
- Verify the rectifier circuits using diodes and implement them using hardware.
- Design the biasing circuits like self-biasing.
- Design various amplifiers like CE, CC, common source amplifiers and implement them using hardware and also observe their frequency responses.

References:

1. Milliman Hallkias - Integrated Electronics; TMH Pub.
2. Gayakwad; OP-amp and linear Integrated Circuits; Pearson Education
3. Salivahanan; Electronic devices and circuits; TMH
4. Robert Boylestad & Nashetsky; Electronics Devices and circuit Theory; Pearson Ed.
5. Salivahanan; Linear Integrated Circuits; TMH
6. Miliman Grabel; Micro electronics, TMH

List of Experiments:

1. Diode and Transistor characteristics
 2. Transistor Applications (Amplifier and switching)
 3. OP-Amp and its Applications
 4. 555 timer and its Applications
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TBCS - 303	Digital Circuit Systems	5(3+1+1)	50	20	30	25	25	150	3 hr	2 hr

Course Objectives:

To expose the students to perform binary arithmetic and conversion from one number system to another and learn different Boolean simplification techniques. We learn the design and analysis of combinational and sequential circuits.

Syllabus

Unit I

Number systems & codes, Binary arithmetic, Boolean algebra and switching function. Minimization of switching function, Concept of prime implicant, Karnaugh map method, Quine McCluskey's method, Cases with don't care terms, Multiple output switching function.

Unit II

Introduction to logic gates, Universal gate, Half adder, Half subtractor, Full adder, Full subtractor circuits, Series & parallel addition, BCD adders, Look-ahead carry generator.

Unit III

Linear wave shaping circuits, Bistable, Monostable & Astable multivibrator, Schmitt Trigger circuits & Schmitt-Nand gates. Logic families: RTL, DTL, All types of TTL circuits, ECL, I²L, PMOS, NMOS, & CMOS logic, Gated flip-flops and gated multivibrator, Interfacing between TTL to MOS.

Decoders, Encoders, Multiplexers, Demultiplexers, Introduction to various semiconductor memories, & designing with ROM and PLA. Introduction to Shift Registers, Counters, Synchronous & Asynchronous counters, Designing of combinational circuits like code converters.

Unit V

Introduction of Analog to Digital & Digital to Analog converters, sample & hold circuits and V-F converters.

OUTCOMES: Upon completion of the course, the students will be able to Perform Simplification of Boolean Functions using Theorems and Karnaugh Maps and Convert between digital codes using encoder/decoder .Student can analyze combinational circuits and sequential circuits .

References:

- 1.M. Mano; “ Digital Logic & Computer Design”; Pearson
- 2.Malvino Leach; “Digital Principles & Applications”;TMH
- 3.Millman & Taub; “Pulse Digital & Switching Waveforms”;TMH
4. W.H Gothman; “Digital Electronics”;PHI
5. R.P.Jain “Modern Digital Electronics” TMH

List of Experiments :

- 1.To study and test operation of all logic gates for various IC’s (IC#7400, IC#7403, IC#7408, IC#7432, IC#7486)
 - 2.Verification of DeMorgan’s Theorem.
 - 3.To construct half adder and full adder.
 - 4.To construct half subtractor and full subtractor circuits.
 - 5.Verification of versatility of NAND gate.
 6. Verification of versatility of NOR gate.
 7. Designing and verification of property of full adder.
 - 8.Design a BCD to excess-3 code convertor.
 - 9.Design a Multiplexer/Demultiplexer
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TBCS - 305	Data Structures II	5(3+1+1)	50	20	30	25	25	150	3 hr	2 hr

Course Objectives

Data structures play a central role in modern computer science. In addition, data structures are essential building blocks in obtaining efficient algorithms. The objective of the course is to teach students how to design, write, and analyze the performance of programs that handle structured data and perform more complex tasks, typical of larger software projects. Students should acquire skills in using generic principles for data representation & manipulation with a view for efficiency, maintainability, and code-reuse. Another goal of the course is to teach advance data structures concepts, which allow one to store collections of data with fast updates and queries.

Syllabus

Unit I

Introduction –Common operations on data structures, Types of data structures, Data structures & Programming, Program Design, Complexities, Time Complexity, order of Growth, Asymptotic Notation.

Unit II

Advanced Data Structures-Hash tables ,Heaps , Complexity , Analysis of Heap Operations , Application of Heap , AVL tress , Insertion & Deletion in AVL tree , Red Black Trees , Properties of Red Black trees ,Insertion & Deletion in Red Black tree .

Unit III

Sorting –Need for sorting , Types of sorting algorithm-Stable sorting Algorithm, Internal & External sorting algorithm , Outline and offline algorithm ,Sorting Techniques-Insertion , Shell , Selection , Merge ,Quick sort, Radix sort ,bucket sort .

Unit IV

Augmenting Data structures – Augmenting a red black trees, Retrieving an element with a given rank , Determining the rank of element ,Data structure Maintenance ,An augmentation strategy ,Interval Trees.

Unit V

File structures- Basic file operations, File organization –Sequential file organization, Indexed sequential file organization, Direct file organization. External merge sort, Multiway Merge sort, Tournament Tree ,Replacement Selection .

- **Course outcomes:** Understanding of basic data structures.
- Understanding of basic sorting and searching algorithms.
- Knowledge to use appropriate data structure and algorithm to solve a problem.
- The ability to estimate time complexity (Big-O).

REFERENCES:

1. Horowitz and Sahani, “Fundamentals of data Structures”,University Press
 2. Trembley and Sorenson , “Data Structures”, TMH Publications
 - 3..A. M. Tenenbaum, “Data Structures using C & C++”, Pearson Pub
 4. Venkatesan , Rose, “Data Structures” Wiley India Pvt.Ltd
 5. Pai; Data structure and algorithm , TMH Publications
 6. T.H.Coreman,”Introduction to algorithm”,PHI.
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TBCS – 306	Communication Skills	3(1+0+2)	50	20	30	25	25	150	3 hr	2 hr

Syllabus

Theory:

Introduction: Communication, definition and role of communication, Process of communication, Importance of professional communication, Levels of communication, Types of communication, Challenges in communication. Non –verbal communication – Body language, personal appearance, posture, gesture and hand movement, eye contact, facial expressions, paralinguistic features - proxemics, haptics, chronemics. Oral presentations.

Practical:

1. Reading comprehension Module
2. Role plays Module
3. Debate Module
4. Group discussion Module
5. Resume writing Module
6. Interview skills Module
7. Body language Module
8. Oral presentations

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STCS-301	C++	3(1+0+2)	30	10	10	50	50	150	1 hr	2 hr

Syllabus

Theory:

UNIT-I

Introduction to Programming, Categories of Programming Languages ,Program Design, Programming Paradigms, Characteristics or Concepts of OOP, Procedure Oriented Programming VS object oriented Programming. Basics of C ,Introduction to C++: Character Set, Tokens, Precedence and Associativity, Program Structure, Data Types, Variables, Operators, Expressions, Statements and control structures, I/O operations, Array, Functions

UNIT-II

Introduction to C++: Character Set, Tokens, Precedence and Associativity, Program Structure, Data Types, Variables, Operators, Expressions, Statements and control structures, I/O operations, Array, Functions

UNIT-III

Object & Classes, Scope Resolution Operator, Constructors & Destructors, Friend Functions, Inheritance, Polymorphism, Overloading Functions & Operators, Types of Inheritance, Virtual functions.

UNIT-IV

Relationships between classes, Association of objects, Types of Association, Recursive Association, Multiplicities, Navigability, Named association, Aggregation of objects. Types of Aggregation, Delegation,

Modeling Association and Aggregation .Container Classes, Container types, typical functions and iterator methods, Heterogeneous containers

UNIT -V

Persistent objects, stream, and files in c++ , Introduction to Data Structures in c++, Study of C++/Java as Object-oriented programming language.

Practical:

1. Write an object oriented program for checking whether a entered character is lower case, uppercase or digit.
2. Write an OOP that ask for two numbers and an operator. According to the operator give the arithmetic operation will be performed.
3. Write an OOP to check whether a given no is prime or not.
4. Write an OOP to calculate the sum of n positive integer using member function.
5. Write an OOP to swap given number using function.
6. Write an OOP to generate a series of Fibonacci number using parameterized constructor.
7. Write an OOP to read set of lines and store it in an one dimension array, display the content of the array and the no of character on screen.
8. Write an OOP to read 2-D array and find the sum of the elements row wise and column wise separately and display the sum of row and columns.
9. Write an OOP to overload the following operators.
 - i) Binary + operator
 - ii) Relational < , = operator.
10. Write an OOP to overload a function area for the following
 - i) circle
 - ii) triangle
 - iii) rectangle
11. Write an OOP to read any five real numbers and print the average using a static member function.
12. Write an OOP to calculate the sum of private data of the class with a private data of another class second through the common friend function.

13. Write a program to read the following information in which the base class consist of employee name, code and designation. The derived class contain the data year of experience and age.(use single inheritance)
14. Write a program to convert a lower case character to an upper case character of text file.
- 15 .Write a program to access the method of derived class through a pointer of base class.

Reference Books:

1. David Parsons “Object oriented programming with C++”, BPB publication
 2. Robert Lafore ,”Object oriented programming in C++” Galgotia
 3. Balagurusamy , “Object oriented programming in C++”, TMH
 4. Herbert Schildt , “Java Complete Reference” ,Mc Graw Hill.
 5. Hubbard , “Programming in C++ (Schaum)” ,TMH
 6. Venugopal ,” Mastering C++”,TMH
 7. “Object oriented technology”,Mahindra ku.,Shree Sai.
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STCS-302	JAVA Programming	3(1+0+2)	30	10	10	50	50	150	1 hr	2 hr

Syllabus

Theory

UNIT-I

The Java Environment: History of Java; Comparison of Java and C++; Java as an object oriented language; Java buzzwords; A simple program, its compilation and execution; the concept of CLASSPATH; Basic idea of application and applet;

Basics: Data types; Operators- precedence and associatively; Type conversion; The decision making – if, if..else, switch; loops – for, while, do...while; special statements–return, break, continue, labeled break, labeled continue; Modular programming methods; arrays; memory allocation and garbage collection in java.

UNIT-II

Object Oriented Programming in Java: Class; Packages; scope and lifetime; Access specifies; Constructors; Copy constructor; this pointer; finalize () method; arrays; Memory allocation and garbage collection in java. Inheritance : Inheritance basics, method overriding, dynamics method dispatch, abstract classes.

UNIT-III

Interfaces : defining an interface, implementing & applying interfaces, variables in interfaces, extending interfaces.

Multithreading and Exception Handling: Basic idea of multithreaded programming; The lifecycle of a thread; Creating thread with the thread class and runnable interface; Thread synchronization; Thread scheduling; Producer-consumer relationship; Daemon thread, Selfish threads;.

UNIT-IV

Applets: Applet security restrictions; the class hierarchy for applets; Life cycle of applet; HTML Tags for applet.

The AWT: The class hierarchy of window fundamentals; The basic user interface components Label, Button, Check Box, Radio Button, Choice menu, Text area, Scroll list, Scroll bar; Frame; Layout managers-flow layout, Grid layout, Border layout, Card layout.

UNIT-V

JDBC: JDBC-ODBC bridge; The connectivity model; The driver manager; Navigating the resultset object contents; java.sql Package; The JDBC exception classes; Connecting to Remote database.

Practical:

1. Installation of J2SDK
 2. Write a program to show Scope of Variables
 3. Write a program to show Concept of CLASS in JAVA
 4. Write a program to show Type Casting in JAVA
 5. Write a program to show How Exception Handling is in JAVA
 6. Write a Program to show Inheritance
 7. Write a program to show Polymorphism
 8. Write a program to show Access Specifiers (Public, Private, Protected) in JAVA
 9. Write a program to show use and Advantages of CONSTRUCTOR
 10. Write a program to show Interfacing between two classes
 11. Write a program to Add a Class to a Package
 12. Write a program to show Life Cycle of a Thread
 13. Write a program to demonstrate AWT.
 14. Write a program to Hide a Class
 15. Write a Program to show Data Base Connectivity Using JAVA
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16. Write a Program to show "HELLO JAVA" in Explorer using Applet

17. Write a Program to show Connectivity using JDBC 18. Write a program to demonstrate multithreading using Java. 19. Write a program to demonstrate applet life cycle. 20. Write a program to demonstrate concept of servlet

Reference Books:

1. Naughton & Schildt "The Complete Reference Java 2", Tata McGraw Hill
 2. Deitel "Java- How to Program:" Pearson Education, Asia
 3. Horstmann & Cornell "Core Java 2" (Vol I & II) , Sun Microsystems
 4. Ivan Bayross "Java 2.0" : BPB publications
 5. Ivor Horton's "Beginning Java 2, JDK 5 Ed., Wiley India.
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STCS-303	PHP	3(1+0+2)	30	10	10	50	50	150	1 hr	2 hr

Syllabus

Theory

UNIT -I

Introduction: Introduction to www, History Understanding client/server roles Apache, PHP, MySQL, XAMPP Installation

PHP Fundamentals: PHP Basic syntax, PHP data Types, PHP Variables, PHP Constants, PHP Expressions, PHP Operators, PHP Control Structures, PHP Loops

UNIT-II

PHP Arrays: PHP Enumerated Arrays, PHP Associative Arrays Array Iteration, PHP Multi-Dimensional Arrays, Array Functions

PHP Functions: PHP Functions, Syntax, Arguments, Variables, References, Pass by Value & Pass by references, Return Values, Variable Scope, PHP include(), PHP require()

UNIT-III

PHP Forms: PHP Form handling, PHP GET, PHP POST, PHP Form Validation, PHP Form Sanitization

PHP Cookies & PHP Sessions: PHP Cookie handling, PHP Session Handling, PHP Login Session

UNIT -IV

PHP Strings Handling: Strings and Patterns, , Managing user ACL Matching, Extracting, Searching Replacing, Formatting, PCRE

Basic MySQL: Database basics, Indexes, PHP MyAdmin Connect & Pconnect

UNIT-V

Simple SQL queries: MySQL Create, MySQL Insert, MySQL Select, MySQL Update, MySQL Delete, MySQL Truncate, MySQL Drop

Advanced SQL query building: WHERE condition, Order By, Group By, Having, LIKE, AND OR operators

Practical:

1. Write down a simple php program that display a welcome message.
2. Write down a php program to find average number from all the given number using constant and variable.
3. Display or print the details of students in tabular format using associative and multidimensional 4.array in sorted form.
5. Write a program using loop structure to select a date using drop down listbox.
6. Write a php program using different variable functions.
7. Write php script for testing string function.
8. Write php script for testing math and date functions.
9. Write php script for testing array function.
10. Write php script for testing file function.
11. Write a program for creating form using buttons, textboxes and other form elements using \$_POST method to retrieve data.
12. Write a program for creating form using buttons, textboxes and other form elements using \$_GET method to retrieve data.
13. Write php script to passing hidden information to the form processing script hidden form controls.
14. Write a php script to passing variable between pages using URL query string.
15. Write a php script to pass the variable using session.
16. Write a php script to pass the variable using cookie

Reference Books:

1. Rasmus Lerdorf, Kevin Tatroe, Peter MacIntyre "Programming PHP" O'REILLY

Chris Shiflett, "Essential PHP Security", O'Reilly

2. Larry Ullman, "PHP 5 Advanced: Visual QuickPro Guide", 2nd Edition

Luke Welling, Laura Thomson, "PHP and MySQL Web Development", 4th Edition .

3. Developers Library

Lorna Jane Mitchell, "PHP Web Services: APIs for the Modern Web" O'REILLY

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