**VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN**

**[AUTONOMOUS]**

## B.Sc., (COMPUTER SCIENCE)

(Candidates admitted from 2014-2015 onwards)

# REGULATIONS

## I. SCOPE OF THE Programme

Bachelor of Computer Science can be considered to be one of the most prominent UG level programs in our country. This program mainly deals with the development of computer applications for the purpose of updating computer programming languages. B.Sc.[CS] also aims at creating strong knowledge of theoretical computer science subjects who can be employed in software development and testing units of industries. The course has a time period of 3 years with 6 semesters.

## II. SALIENT FEATURES

- Regular conduct of guest lectures and seminars
- Campus recruitment
- Provides facilities such as Internet Access and In-House Library
- Provides Career Guidance for Post Graduate Courses like MCA, and the Certifications in programming languages
- Conduct of Personality Development Program
- Visiting Faculties from Industries

## III. OBJECTIVES OF THE COURSE

The Course Objective of the B.Sc. Computer Science program is to provide advanced and in-depth knowledge of computer science and its applications to enable students pursue a professional career in Information and Communication Technology in related industry, business and research. The course designed to impact professional knowledge and practical skills to the students.

## IV. ELIGIBILITY FOR ADMISSION

A Candidates seeking admission to the first year Degree course (**B.Sc. COMPUTER SCIENCE)** shall be required to have passed Higher Secondary Examination with Mathematics or Business Mathematics or Computer Science or Statistics (Academic Stream or Vocational Stream) as one of the subject under Higher Secondary Board of Examination, conducted by the Government of Tamilnadu or an examination accepted as equivalent thereto by the syndicate, subject to such conditions as may be prescribed thereto are permitted to appear and qualify for the **B.Sc. Computer Science** Degree Examination of Periyar University after a course of study of three academic years.

## V.DURATION OF THE Programme

- The course shall extend over a period of three academic years consisting of six semesters. Each academic year will be divided into two semesters. The First semester will consist of the period from July to November and the Second semester from December to April.
- The subjects of the study shall be in accordance with the syllabus prescribed from time to time by the Board of Studies of Vivekanandha College of Arts and Sciences for Women with the approval of Periyar University.

## VI. CONTINUOUS INTERNAL ASSESSMENT (CIA)

The performance of the students will be assessed continuously and the Internal Assessment Marks for Theory papers

1. Average of two Tests - 10 Marks
2. Seminar - 5 Marks
3. Assignment - 5 Marks
4. Attendance - 5 Marks

Total = 25 Marks

Internal Assessment Marks for Practical

1. Attendance - 10 Marks
2. Observation - 10 Marks
3. Test - 20 Marks

Total = 40 Marks

**PASSING MINIMUM (Theory)**

**EXTERNAL**

In the University Examinations, the passing minimum shall be 40 % out of 75 Marks. (30 Marks)

**PASSING MINIMUM (Practical / Mini project)**

**EXTERNAL**

In the University Examinations, the passing minimum shall be 40 % out of 60 Marks. (24 Marks)

Distribution of Marks

| | |
|---|---|
| Problem Understanding | : 05 Marks |
| Program writing | : 10 Marks |
| Debugging | : 10 Marks |
| For Correct Results | : 05 Marks |

**The Passing minimum shall be 40% out of 60 marks (24 Marks)**

## VII. ELIGIBILITY FOR EXAMINATION

**Distribution of marks for attendance**

| PERCENTAGE | MARKS | |
|---|---|---|
| | THEORY | PRACTICAL |
| 75-80 | 1 | 2 |
| 81-85 | 2 | 4 |
| 86-90 | 3 | 6 |
| 91-95 | 4 | 8 |
| 96-100 | 5 | 10 |

A candidate will be permitted to appear for the University Examination only on earning 75 % of attendance and only when her conduct has been satisfactory. It shall be opened to grant exemption to a candidate for valid reasons subject to conditions prescribed.

## VIII. CLASSIFICATION OF SUCCESSFUL CANDIDATES

Successful candidates passing the examination of Core Courses (main and allied subjects) and securing marks

a) 75 % and above shall be declared to have passed the examination in first class with Distinction provided they pass all the examinations prescribed for the course at first appearance itself.

b) 60% and above but below 75 % shall be declared to have passed the examinations in first class without Distinction.
c) 50%and above but below 60% shall be declared to have passed the examinations in second class.
d) All the remaining successful candidates shall be declared to have passed the examinations in third class.
e) Candidates who pass all the examinations prescribed for the course at the first appearance itself and within a period of three consecutive academic years from the year of admission only will be eligible for University rank.

## IX. ELIGIBILITY FOR AWARD OF THE DEGREE

A candidate shall be eligible for the award of the degree only if she has undergone the above degree for a period of not less than three academic years comprising of six semesters and passed the examinations prescribed and fulfilled such conditions have been prescribed therefore.

## X. PROCEDURE IN THE EVENT OF FAILURE

If a candidate fails in a particular subject, she may reappear for the semester examination in the concerned subject in subsequent semesters and shall pass the examination.

## XI. COMMENCEMENT OF THESE REGULATIONS

These regulations shall take effect from the academic year 2014-15 (i.e.,) for the students who are to be admitted to the first year of the course during the academic year 2014-15 and thereafter.

## EVALUATION OF EXTERNAL EXAMINATIONS (EE)

## QUESTION PAPER PATTERN – Theory

Time Duration: 3 Hours Max. Marks: 75

**PART- A: 10x2 = 20**

Answer all the Questions

Two Questions from each unit

**PART- B: 5x5 = 25**

Answer all the Questions

One Question from each unit (either or type)

**PART- C: 3x10 = 30**

Answer Any Three Questions

One Question from each unit (3 Out of 5)

The Passing minimum shall be 40% out of 75 marks (30 marks)

## QUESTION PAPER PATTERN – Practical

Time duration: 3 Hours Max. Marks: 60

1. One compulsory question from the given list of objectives : 30 Marks
2. One Either/OR type question from the given list of objectives : 30 Marks

The Passing minimum shall be 40% out of 60 marks (24 marks)

# B.Sc. COMPUTER SCIENCE

## COURSE PATTERN AND SCHEME OF EXAMINATIONS UNDER CBCS
## Candidates admitted from the year 2016- 2017(Onwards)

| Sem | Course Code | Part | Courses | Hour | Credit | Marks | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Int. Marks | Ext. Marks | Total Marks |
| I | 14U1LT01 | I | Tamil-I | 6 | 3 | 25 | 75 | 100 |
| | 14U1LE01 | II | English I | 6 | 3 | 25 | 75 | 100 |
| | 14U1CSC01 | IV | Core – I Digital Computer Fundamentals and C Programming | 6 | 5 | 25 | 75 | 100 |
| | 14U1CSCP01 | IV | Core I P - Programming in C Lab | 5 | 3 | 40 | 60 | 100 |
| | 14U1MAA03 | III | Allied-I Numerical Methods | 5 | 4 | 25 | 75 | 100 |
| | 14U1VE01 | | Value Education | 2 | 2 | 25 | 75 | 100 |
| | **TOTAL** | | | **30** | **20** | **165** | **435** | **600** |
| II | 14U2LT02 | I | Tamil-II | 6 | 3 | 25 | 75 | 100 |
| | 14U2LE02 | II | English-II | 6 | 3 | 25 | 75 | 100 |
| | 14U2CSC02 | IV | Core II - Programming in C++ and Data Structures | 6 | 5 | 25 | 75 | 100 |
| | 14U2CSCP02 | IV | Core II P - Programming in C++ Lab | 5 | 3 | 40 | 60 | 100 |
| | 14U2MAA07 | III | Allied II Discrete Mathematics | 5 | 4 | 25 | 75 | 100 |
| | 14U2ES01 | | Environmental Studies | 2 | 2 | 25 | 75 | 100 |
| | **TOTAL** | | | **30** | **20** | **165** | **435** | **600** |
| III | 14U3LT03 | I | Tamil-III | 6 | 3 | 25 | 75 | 100 |
| | 14U3LE03 | II | English-III | 6 | 3 | 25 | 75 | 100 |
| | 14U3CSC03 | IV | Core III- Relational Database Management Systems | 5 | 4 | 25 | 75 | 100 |
| | 14U3CSCP03 | IV | Core III P- RDBMS Lab | 3 | 3 | 40 | 60 | 100 |
| | 14U3CMA03 | III | Allied-III Financial Accounting | 5 | 4 | 25 | 75 | 100 |
| | 14U3CSN__ | VI | NMEC-I | 2 | 2 | 25 | 75 | 100 |
| | 14U3CSS01 | VII | SBEC-I - Office Automation | 3 | 3 | 25 | 75 | 100 |
| | **TOTAL** | | | **30** | **22** | **190** | **510** | **700** |
| IV | 14U4LT04 | I | Tamil-IV | 6 | 3 | 25 | 75 | 100 |
| | 14U4LE04 | II | English-IV | 6 | 3 | 25 | 75 | 100 |
| | 14U4CSC04 | IV | Core-IV- Visual Programming | 5 | 4 | 25 | 75 | 100 |
| | 14U4CSCP04 | IV | Core-IV P- Programming in VB Lab | 3 | 3 | 40 | 60 | 100 |
| | 14U4CMA04 | III | Allied-IV Cost and Management Accounting | 5 | 4 | 25 | 75 | 100 |
| | 14U4CSN__ | VI | NMEC-II | 2 | 2 | 25 | 75 | 100 |
| | 14U4CSS02 | VII | SBEC-II-DTP Package | 3 | 3 | 25 | 75 | 100 |
| | **TOTAL** | | | **30** | **22** | **190** | **510** | **700** |
| V | 14U5CSC05 | IV | Core-V Java Programming | 5 | 5 | 25 | 75 | 100 |
| | 14U5CSC06 | IV | Core-VI Computer Networks | 5 | 5 | 25 | 75 | 100 |
| | 14U5CSC07 | IV | Core-VII Compiler Design | 5 | 5 | 25 | 75 | 100 |
| | 14U5CSE__ | V | Elective – I | 5 | 5 | 25 | 75 | 100 |
| | 14U5CSCP05 | IV | Core- V P - Programming in Java | 6 | 3 | 40 | 60 | 100 |
| | 14U5CSS03 | VII | SBEC –III PHP Programming | 2 | 3 | 25 | 75 | 100 |
| | 14U6CSS04 | VII | SBEC-IV Soft Skills | 2 | 2 | 25 | 75 | 100 |
| | **TOTAL** | | | **30** | **27** | **190** | **510** | **700** |
| VI | 14U6CSC08 | IV | Core- VIII Operating Systems with Unix | 5 | 5 | 25 | 75 | 100 |
| | 14U6CSE__ | V | Elective – II | 5 | 5 | 25 | 75 | 100 |
| | 14U6CSE__ | V | Elective – III | 5 | 5 | 25 | 75 | 100 |
| | 14U6CSCP06 | IV | Core-VI P - Programming In Unix Lab | 6 | 3 | 40 | 60 | 100 |
| | 14U6CSPR01 | IV | Core-IX Project work (In-House Mini Project) | 5 | 6 | 40 | 60 | 100 |
| | 14U6CSS05 | VII | SBEC-V Scripting Languages (JAVA and VB) | 2 | 2 | 25 | 75 | 100 |
| | 14U6CSS06 | VII | SBEC-VI Multimedia | 2 | 2 | 25 | 75 | 100 |
| | 14U6EX01 | | Extension Activities | - | 1 | - | - | - |
| | **TOTAL** | | | **30** | **29** | **205** | **495** | **700** |
| **GRAND TOTAL** | | | | **180** | **140** | **1205** | **2895** | **4000** |

## ELECTIVE COURSES

### ELECTIVE – I

| Semester | Course Code | Course Name |
|---|---|---|
| V | 14U5CSE01 | Grid computing |
| V | 14U5CSE02 | Software Engineering |
| V | 14U5CSE03 | Middleware Technologies |

### ELECTIVE – II

| Semester | Course Code | Course Name |
|---|---|---|
| VI | 14U6CSE04 | Multimedia and its Applications |
| VI | 14U6CSE05 | System Analysis and Design |
| VI | 14U6CSE06 | Software Testing |

### ELECTIVE – III

| Semester | Course Code | Course Name |
|---|---|---|
| VI | 14U6CSE07 | Web Technology |
| VI | 14U6CSE08 | Client/Server Technology |
| VI | 14U6CSE09 | Android Applications |

| 2014-2015 Onwards | DIGITAL COMPUTER FUNDAMENTALS AND C PROGRAMMING (14U1CSC01) | B.Sc.,Computer Science |
|---|---|---|
| I Semester | | Core-I |
| Hours:60 | | Credit :5 |

**OBJECTIVE:**

To create awareness about the basics of fundamentals towards programming and to sketch out the hidden talent of student community.

**UNIT – I** **Hours: 12**

Introduction to computers: Introduction – Characteristics – Generation of computers – Classification of digital computer system – Functions & Components of computer system – Memory units - Input devices: Keyboard - mouse - OCR – OMR – Touch screen. Output Devices: Monitor – Printer: Dot matrix, laser printer.

**UNIT – II** **Hours: 10**

Number System : Decimal – Binary – Octal –Hexadecimal number system – Conversion – Binary Addition – Binary Subtraction – Complements – BCD – ASCII Code – EBCDIC Code. Boolean Algebra & Gate network: AND – OR – NOR – NAND - XOR Gates. Demorgan's Theorem.

**UNIT – III** **Hours: 11**

Overview of C: Introduction – Basic structure of C programs – Character set – C Tokens – Keywords & Identifiers – Constant – Variables and its types – Operators & expressions – Type conversions in expressions – Managing Input & Output Operations.

**UNIT – IV** **Hours: 13**

Decision Making & Branching Statements: IF – IF-else – Nesting of IF-else – Switch – GOTO Statement. Looping Statement: While – Do..While statement – For statement. Arrays: Definition & Declaration – Simple Array – One dimensional – Multi dimensional. String Handling. Function: Introduction - Function calls – Function declarations & Return types – Recursion.

**UNIT – V** **Hours: 14**

Structures & Unions: Defining a structure – Declaring structure variables – Accessing structure members – structure Initialization. Unions. Pointers: Introduction – Understanding pointers – Accessing the address of a variable – Initializing of pointer variables. File Management: Introduction - Defining & Opening a file – Closing a file – Input / Output Operation on files.

**Text Books:**


1. "Fundamentals of Computer science & Communication Engineering". Alexis Leon, Mathew's Leon, Vikas Publishing house, New Delhi, 2012 (Unit I: Chapters -2,3,4,6,7,8,9&10 )
2. "Digital Computer Fundamentals" Thomas C Bartee, 6th EditionT.M.H Publisher, New Delhi, 2011 (Unit II:Chapters2&3)
3. "Programming in ANSI C , E. Balagurusamy Tata MC Graw hill, New Delhi, 4th Edition,2012. (Unit III: Chapters 1,2,3&4 Unit-IV:Chapters 5,6,7,8,9 Unit-V:10,11&12)

| 2014-2015 Onwards | DIGITAL COMPUTER FUNDAMENTALS AND C PROGRAMMING (14U1CSCP01) | B.Sc.,Computer Science |
|---|---|---|
| I Semester | | Core: Practical-I |
| Hours:50 | | Credit :3 |

**OBJECTIVE:**

To create awareness about the basics of fundamentals towards programming and to sketch out the hidden talent of student community.

1. Program to find the Factorial of N Numbers.
2. Program to find the Fibonacci series of N numbers.
3. Program to find the solution for the Quadratic Equation (All Cases)
4. Program to Sort and find the largest and smallest of the given array of numbers.
5. Program to implement Matrix Manipulation.
6. Program to check whether the given string is Palindrome or not.
7. Program to implement string handling functions.
8. Program to find the number of characters, words and lines in a given string.
9. Sorting the given names in ascending and descending order.
10. Program to Swap two numbers using functions and Pointers.
11. Program to prepare Student Mark list using structure.
12. Program to prepare Pay Bill using files.

| 2014-2015 Onwards | NUMERICAL METHODS (14U1MAA03) | B.Sc.,Computer Science |
|---|---|---|
| I Semester | | Allied - I |
| Hours:50 | | Credit :4 |

**Objectives :**

To provide quality in the field of reasoning and to improve the ability towards recruitment.

**Unit I** **Hours: 09**

Solution of algebraic and transcendental Equations –Bisection method-Iteration method – Method of false position –Newton Raphson method – Problems.

**Unit II** **Hours: 11**

Interpolation with equal intervals –Newton's forward and Backward Interpolation formula – Central Difference Interpolation formula –Gauss's forward and Backward Interpolation formula.

**Unit III** **Hours: 10**

Numerical Differentiation – Derivatives using Newton's Forward - Newton's Backward – Striling's Formula.

**Unit IV** **Hours: 11**

Numerical Integration – Trapezoidal rule – Simpson's one – third rule – Simpson's three – eighth rule – Boole's rule – weddle's rule – Problems.

**Unit V** **Hours: 09**

Solution of linear simultaneous equations – Direct method – Matrix inversion method – Gauss elimination method – Gauss - Jordan method – Jacobi's iteration method – Gauss – Seidal iteration - Problems.

**Text book**

1. *Numerical methods* by P. Kandasamy , K.Thilagavathy, K.Gunavathi(Third Edition) Publication – S.Chand & company Ltd, New Delhi 2012.

**Reference books:**

1. *Numerical Methods* by A. Singaravelu , Publication -Meenakshi company Chennai,2008.
2. *Introductory Methods of Numerical Analysis* – 5 $^{th}$ Edition. S.S. Sastry – Prentice – Hall of India Pvt Ltd , New Delhi-2012.

| 2014-2015 Onwards | PROGRAMMING IN C++ AND DATA STRUCTURES (14U2CSC02) | B.Sc.,Computer Science |
|---|---|---|
| II Semester | | Core:II |
| Hours:60 | | Credit :5 |

**OBJECTIVE:**

To create awareness in programming language towards the recent trends of competition and to sketch out the hidden talent of student community.

**UNIT I** **Hours: 08**

Programming in C++: Introduction-Basic concepts of OOP-Applications of OOP-What is C++?-Applications of C++-Structure of C++ program-Tokens-Keywords-Identifiers and constants-Data types-symbolic constants-Operators-Manipulators-Control Structures- Arrays.

**UNIT II** **Hours: 13**

Functions in C++: Main Function-Function prototyping-call and return by reference- Inline Functions-Function overloading-Friend and virtual functions. Class and Objects: Introduction-Specifying a class-Defining Member Functions-C++ program with class-Memory allocation for objects-static data members-static member functions-Returning objects. Constructors-Default Constructors-Parameterized Constructors- Copy Constructors-Dynamic Constructors-Destructors

**UNIT III** **Hours: 14**

Operator Overloading: Introduction-Overloading Unary, Binary Operators-Manipulation of strings using Operators-Type Conversions-Inheritance-Defining derived classes-single inheritance-multilevel inheritance- multiple inheritance-hierarchical inheritance- hybrid inheritance-virtual base class-this pointer-virtual functions-Exception handling-Templates.

**UNIT-IV** **Hours: 12**

Data Structures: Basic Abstract Data Types: The Abstract Data Type "List": Array implementation of lists-pointer implementation of lists-Doubly linked lists- Stacks: Array implementation of Stacks-Queues: Pointer Implementation- a Circular Array Implementation of Queues.

**UNIT V** **Hours: 13**

Trees: Basic terminology-Preorder, post order, in-order of nodes-The ADT Tree-Array representation of Trees-Binary Search Tree. Sorting-The internal Sorting Model-Bubble sort-Insertion sort-Selection sort-Quick sort-Heap sort-Bin sort-Radix sort.

**Text Books:**


1. Object Oriented Programming with C++ by E.Balagurusamy 2011. (Unit-I: Chapters 1,2&3, Unit-II:4,5&6, Unit-III: Chapters 7,8,9,12&13)
2. Data Structures and Algorithms by Alfred V. Aho, Murray Hill, John E. Hopcroft, Jeffrey D. Ullman, 2009. (Unit –IV: Chapter 2, Unit-V: Chapter 3)


**Reference Books:**


1. Let Us C++ by Yashavant Kanetkar, 2012.
2. Classical Data structure by Samanta, 2008.

| 2014-2015 Onwards | PROGRAMMING IN C++ LAB (14U2CSCP02) | B.Sc.,Computer Science |
|---|---|---|
| II Semester | | Core:Practical -II |
| Hours:50 | | Credit :3 |

**OBJECTIVE:**

To create awareness in programming language towards the recent trends of competition and to sketch out the hidden talent of student community.

1. Write a C++ Program to read an integer number and find the sum of all the digits until it reduces to a single digit using constructors, destructors and inline member functions.
2. Write a C++ Program to create class. Create a pay scale with all basic divisions of category.
3. Write a C++ Program using inheritance to perform addition, subtraction, multiplication, division respectively.
4. Write a C++ Program using Function Overloading to read two Matrices of different Data Types such as integers and floating point numbers. Find out the sum of the above two matrices separately and display the sum of these arrays individually.
5. Write a C++ program to Prepare Mark sheets for n students with Exception Handling.
6. Implement Push, Pop Operations of a Stack using Array
7. Implement Push, Pop Operations of a Stack using Pointer.
8. Implement Add, Delete Operations of a Queue using Array
9. Implement Push, Pop Operations of a Queue using Pointer.
10. Write a Program to Create a Doubly Linked List and to Insert or Delete an Element from Doubly Linked List.
11. Write a C++ program to sort a set of integers in ascending order using bubble sort.
12. Write a C++ program to sort a set of integers in descending order using Insertion sort.

| 2014-2015 Onwards | DISCRETE MATHEMATICS (14U2MAA07) | B.Sc.,Computer Science |
|---|---|---|
| II Semester | | Allied - II |
| Hours:50 | | Credit :4 |

**Objectives :**

To provide quality in the field of reasoning and to improve the ability towards recruitment.

**UNIT I** **Hours: 10**

Mathematical Logic – Statements and Notations – Connectives – Negation – conjunction – Disjunction – Statement Formulas and Truth Table – Conditional and Biconditional – Well formed Formulas – Tautologies.

**UNIT II** **Hours: 08**

Normal Forms – Disjunctive Normal Forms – Conjunctive Normal Forms – Principal Disjunctive Normal Forms – Principal Conjunctive Normal Forms– The Theory of Inference for the Statement Calculus – Validity using Truth tables – Rules of Inference – Consistency of premises and indirect method of proof.

**UNIT III** **Hours: 11**

Relations & ordering – Relations – Properties of binary relation in a set – Functions – Definition & Introduction – Composition of Functions – Inverse function – Binary and n – array operations – Hashing Functions – Natural numbers – Peano Axioms & Mathematical Induction – Cardinality.

**UNIT IV** **Hours: 11**

Lattices as partially ordered Sets- Definition and Examples – some properties of Lattices – Lattices as Algebraic systems – sub Lattices – Direct product and homomorphism.

**UNIT V** **Hours: 10**

Boolean Algebra- Definition and Examples – sub algebra, Direct product and homomorphism – Boolean Functions – Boolean Forms and Free Boolean Algebras – Values of Boolean Expression and Boolean Functions.

**Text book:**

1. *Discrete Mathematical structures with application to computer science* by J.P. Trembly, R.Manohar. Publishing Company Tata Mc Graw Hill, NewDelhi 2013.

**Reference Books:**

1. *Discrete Mathematics* by Prof.V. Sundaresan, K.S. Ganapathy Subramaniyan, K. Ganesan Publishing Company Tata Mc Graw Hill, NewDelhi 2001.
2. *Discrete Mathematics* by Lovarz,J. Pelikan, K. Vexztergombi Publishing company Springer International Edition 2002.

| 2014-2015 Onwards | RELATIONAL DATABASE MANAGEMENT SYSTEM (14U3CSC03) | B.Sc., Computer Science |
|---|---|---|
| III Semester | | Core: III |
| Hours:50 | | Credit :5 |

**Objectives:**

To create awareness about the basics of fundamentals towards programming and to sketch out the hidden talent of students community.

**UNIT I** **Hours : 10**

Introduction to DBMS**:** Information – Data and Data Management – File based data management – Organization of a database – Characteristics of a data in a database – DBMS: Benefits of DBMS – Functions of DBMS – Components of DBMS – data dictionary - data base users. Data Base Architecture and Design: Introduction – Data base architecture – data abstraction – ANSI/SPARC Architecture.- Database Language – Data base Design – Design Constraints.

**UNIT II** **Hours : 10**

Data Models **:** Introduction –Types – Comparison between the various model Entity Relationship Model: Introduction – ER Model – Components of ER model – ER diagram conversions – Relationships – Composite entities – Entity list – ER diagrams – ER modeling symbols

**UNIT II** **Hours : 10**

RDBMS: Introduction – RDBMS terminology – relational data structure – codd's rules - Relational data integrity and database constraints : Introduction – Integrity constraint –Data Normalization : Introduction- Types of Normal forms – Pitfalls in Relational Database Design – Decomposition – Functional Dependencies – Denormalization. Relational Algebra: Introduction – Relational Algebraic Operations – Aggregate functions – update operations. Relational calculus**:** Introduction – tuple relational calculus – domain relational calculus.

**UNIT IV** **Hours : 10**

SQL: Introduction – history of SQL – characteristics of SQL – Advantages of SQL – SQL data types and literals – Types of SQL commands – SQL operators – Tables, views and Indexes**:** Introduction – Views – Indexes. Aggregate functions – INSERT, UPDATE and DELETE operations– join and union

**UNIT V** **Hours : 10**

PL/SQL**:** Programming language: History – Fundamentals – Block structure – commends – Data types – other data types – Declaration – Assignment operation – Bind variables – Substitution variables – printing.Pl/SQL cursor and exceptions – PL/SQL Composite data types**:** Records – Tables. PL/SQL Named block**:** Procedure – Function – Package – Triggers.

**Text Books:**

1. “Fundamentals of Data base management System” – Alexix Leon and Mathew Leon,TMHPublicationsReprint2010.

2. Database system using ORACLE Nilesh shah, 2nd Edition,PHI publication Reprint 2010(Chapter 10,11,12,13,14).

**Reference Book:**

1. “Database System Concepts “–Silberschatz, Korth, MCH International Sixth Edition.

| 2014-2015 Onwards | PRACTICAL-III<br>RELATIONAL DATABASE MANAGEMENT SYSTEM LAB<br>(14U3CSCP03) | B.Sc., Computer Science |
|---|---|---|
| III Semester | | Core : Practical - III |
| Hours:50 | | Credit :3 |

**Objectives:**

To create awareness about the basics of fundamentals towards programming and to sketch out the hidden talent of students community.

1. **Table Creation**
   i) Create the table with the following attribute
      Table Name: Employee
      Attributes: Eno (PK), Ename, Dept, Design, Salary, Phone Number
   ii) Alter the table employee, adds the column age, community.
2. **Data Manipulation**
   i) Insert the values to the above table
   ii) Display the employee names who is working as "Lecturer"
   iii) Display the table in ascending order
   iv) Update the table employee; add 20% Bonus to each employee
3. **QUERIES**
   i) Select ename from employee table such that salary greater than 8000.
   ii) Select Eno, Ename from employee whose salary between 6000 and 15000.
   iii) Create a view tick from employee with Ename, Phone, and Department.
4. Simple queries using built in functions
5. Simple queries using set operations

**PL/SQL**

6. a) Creation of student information records containing Reg.No,Name,Subject Code, Marks, Course and Grade.
   b) Find the Total and average for each student table.
   c) Record Manipulations such as deletion, Modification, Addition and Counting the record.
7. Writing a PL/SQL Program to find the total amount based on rules similar to the following
   i) If UNIT <= 100 then Price is 85 paise per UNIT.
   ii) If UNIT >101 and <= 150 then Price is 1.50 paise per UNIT.
   iii) If UNIT > 151 then Price is 2.00 paise per UNIT.
8. Write a PL/SQL block to count the number of students in each department. If the count value is greater than 60 in each department, then transfer the excess records into another table department wise. Use exception handler to handle this routine.
9. Write a database trigger to implement the concept of master detail relationship.
10. PL/SQL procedure to design Pay Bill.

| 2014-2015 Onwards | FINANCIAL ACCOUNTING (14U3CMA03) | B.Sc., Computer Science |
|---|---|---|
| III Semester | | Allied - III |
| Hours:50 | | Credit :4 |

**Objectives:**

To provide quality in the field of reasoning and to improve the ability towards recruitment.

**UNIT –I** **Hours : 10**

Introduction of Accounting- Objectives- Advantages-Limitations of Accounting- People interested in Accounting- Branches of Accounting- Accounting Concepts and Conventions

**UNIT –II** **Hours : 08**

Preparation of Journal – Ledger- Subsidiary Books – Trial Balance.

**UNIT – III** **Hours : 10**

Final Accounts of a Trading Concern – Trading Account – Profit & Loss Account – Balance Sheet with simple Adjustments

**UNIT –IV** **Hours : 12**

Average Due Date – Account Current.

**UNIT-V** **Hours : 10**

Depreciation Accounting – Definition- Objectives- Causes of Depreciation – Reason for providing Depreciation – Depreciation Methods:- Fixed- Written down Value- Annuity Method.

Note : Distribution of Marks – Problems 70% and Theory 30%.

**TEXT BOOKS:**

1. Financial Accounting – R.L.Gupta & V.K. Gupta, Sultan Chand & sons, New Delhi, 2008

2. Financial Accounting - S.P.Jain & K.L.Narang. Kalyani Publishers, New Delhi , 2006

**BOOKS FOR REFERENCE:**

1. Advanced Accountancy - S.P.Jain & K.L.Narang. Kalyani Publishers, New Delhi , 2006

2. Advanced Accountancy - M.C.Shukla & T.S.Grewal. S.Chand Publications, New Delhi, 2004.

| 2014-2015 Onwards | QUANTITATIVE APTITUDE-1 (14U3MAN01) | B.Sc., Computer Science |
|---|---|---|
| III Semester | | NMEC-I |
| Hours: 50 | | Credit : 02 |

**Objectives:**

To provide quality in the field of reasoning and to improve the ability towards recruitment.

**Unit-I**

HCF and LCM Numbers.

**Unit-II**

Square Roots and Cube root-Average.

**Unit-III**

Problems on Ages and Problems on numbers.

**Unit-IV**

Percentage-Profit and Loss

**Unit-IV**

Partnership and Chain rule.

**Text Book**

1. Quantitative Aptitude- R.S Aggarwal(chapter 2,5,6,7,8,10,11,13,14) S.Chand & Company LTD,New Delhi reprint 2011

| 2014-2015 Onwards | OFFICE AUTOMATION (14U3CSS01) | Skill Based Elective Course-I |
|---|---|---|
| III Semester | | Common for B.Sc(CS), BCA |
| Hours: 30 | | Credit : 3 |

**Objectives:**

To provide awareness in automation and to sketch out the hidden talent of students community recruitment.

**UNIT- I**

Introduction: Introduction to Ms-Office.MS-word: Introduction to Word Basics - Commands - Copying and Moving Text - Working with Text - Find and Replace - Formatting Text - Mail Merge –Table - Spell Check and Grammar.

**UNIT-II**

MS-EXCEL : Excel Basics - Introduction – Menus – Toolbars -Icons – Opening Excel – Cells – Entering and Editing Data – Creation of Chart- Naming Formulas – Functions .

**UNIT-III**

MS-POWER POINT: Introduction – Menus – Toolbars – Creating and Editing Slides – Working with PowerPoint.

**UNIT-IV**

MS-ACCESS: Introduction – Starting Microsoft Access – Creating New Database – Opening Existing Database – Access Database Wizards- Tables – Creating Query.

**UNIT-V**

MS-FRONT PAGE: Introduction – Menus – Toolbars – Creating Webpage- With Wizard - Hyperlinks.

**TEXT BOOKS:**

1. Sanjay Saxena, “MS-OFFICE 2000 for Everyone”, Vikas Pub. House NewDelhi.(Part –II,III, IV, V, VI & IX).

| 2014-2015 Onwards | VISUAL PROGRAMMING (14U4CSC04) | B.Sc., Computer Science |
|---|---|---|
| IV Semester | | Core:IV |
| Hours:50 | | Credit :5 |

**Objectives:**

To create awareness about the basics of fundamentals towards programming and to sketch out the hidden talent of students community.

**UNIT I** **Hours: 10**

Welcome to Visual Basic – What is Visual Basic - Features of Visual Basic – developing an Applications. Creating an Application: Objectives - What does Visual Basic 6 have to create Applications – OLE - Form Layout Window. Forms and Controls: Objectives - The Form - Working with a Control - Opening the Code Window.

**UNIT II** **Hours: 12**

Variables in Visual Basic: Objectives - What is a Variable - Declaring variable - Data Types - The null value - Error value - Empty Value - Scope of a Variable – Module Level Variables - Declaring Variable – Constant - Creating your own Constant - Scope of a Constant. Writing code in Visual Basic – Objectives - The Code Window – The Anatomy of procedure - Editing features. Working with Files - Objectives – Visual Basic file system controls.

**UNIT III** **Hours: 08**

Menus: Objectives - Building the User Interface. Multiple Document Interface Applications – Why MDI Forms - Features of an MDI Form - Loading MDI Forms and Child Forms

**UNIT IV** **Hours: 10**

Working with the Data Control: The Data Control - The Bound Controls – Caution - Coding. Data Access Objects: The JET Database Engine - Functions of the JET Database Engine – SQL - The DAO Objects Model - Why ADO - Establishing a Reference.

**UNIT V** **Hours: 10**

Crystal and Data Reports: Crystal Reports - Data Report - Distributing your Application. ActiveX: Objectives - What is ActiveX – Why ActiveX. ActiveX and Web pages: Objectives - ActiveX and Internet. ActiveX Documents.

**Text Book:**

1. Mohammed. Azam, Programming with Visual Basic 6.0- VlKAS publishing House pvt. Ltd,Year of Publication 2010.(chapter-1,2,3,4,5,6,7,8,12,13,15,16,18,19)

**Reference Book:**

1.”Mastering Visual Basic 6” Evangelus Petroutsos BPB Puhlnata.

2. GRAY CORNELL, "VISUAL BASIC 6 from the GROUND UP", Tata McGraw Hill Edition, 1999.

| 2014-2015 Onwards | PRACTICAL – IV<br>PROGRAMMING IN VB LAB<br>(14U4CSCP04) | B.Sc., Computer Science |
|---|---|---|
| IV Semester | | Core:Practical - IV |
| Hours:50 | | Credit :3 |

**Objectives:**

To create awareness about the basics of fundamentals towards programming and to sketch out the hidden talent of students community.

1. Design a form to print the prime numbers.
2. Write a VB program to prepare traffic light using timer control.
3. Create a VB program to add and remove the items in the list box using add item and remove item methods.
4. Write a VB program to create picture viewer.
5. Write a VB program to add and read the data in a sequential file.
6. Design an Arithmetic Calculator using VB.
7. Write a VB program to Prepare Students Mark Sheet. (using database)
8. Develop a VB project to prepare Personal Information System (Using database and create data report)
9. Develop a VB project to display the employee details in the form using Active X Data Control.
10. Develop a VB project to prepare Library Information System.(Using Tables)

| 2014-2015 Onwards | COST AND MANAGEMENT ACCOUNTING (14U4CMA04) | B.Sc., Computer Science |
|---|---|---|
| IV Semester | | Allied - IV |
| Hours:50 | | Credit :4 |

**Objectives:**

To provide quality in the field of reasoning and to improve the ability towards recruitment.

**UNIT –I** **Hours:10**

Cost accounting – Meaning, Scope, objectives- Advantages & Limitations- Difference between Cost accounting and Financial Accounting – Elements of Cost – Preparation of CostSheet.

**UNIT –II** **Hours:10**

Material Management – Purchase Procedure – Various stock levels- Economic Order Quantity – Bin Card and stores ledger-Pricing of issues – FIFO, LIFO – Simple Average and weighted average Methods – Stock Control.

**UNIT – III** **Hours:8**

Management Accounting: Nature and Scope- Meaning and definition- Objectives- Management Accounting and Financial Accounting- Management Accounting and Cost Accounting.

**UNIT –IV** **Hours:12**

Budget and Budgetary Control: Meaning, Importance, Preparation of Sales Budget, Production Budget- Raw materials Budget – Cash Budget – Flexible Budget.

**UNIT-V** **Hours:10**

Marginal Costing – Break Even Analysis for profit planning and Control – P/V ratio- BEP and Margin of Safety.

**Note : Distribution of Marks – Problems 70% and Theory 30%.**

**TEXT BOOKS:**

1.Cost Accounting – Jain & Narang, Kalyani Publishers, New Delhi , 2006

2.Management Accounting – S.N.Maheswari Sultan Chand & Sons, New Delhi , 2005.

**BOOKS FOR REFERENCE:**

1.Cost Accounting - Reddy & Hari Prasad Reddy, Margham Publishers, Chennai,2009

2.Management Accounting – Dr.S.Ganesan and Kalavathi, Thriumalai Publications Nagarkoil,2008

| 2014-2015 Onwards | QUANTITATIVE APTITUDE-2 (14U4MAN02) | B.Sc., Computer Science |
|---|---|---|
| IV Semester | | NMEC-II |
| Hours: 50 | | Credit : 02 |

**Objectives:**

To provide quality in the field of reasoning and to improve the ability towards recruitment.

**UNIT-I**

Time and Work, Time and Distance.

**UNIT-II**

Problems on Trains-Boats and Streams.

**UNIT-III**

Simple Interest – Compound Interest.

**UNIT-IV**

Calendar – Clocks.

**UNIT-V**

True Discount and Bankers Discount.

**TEXT BOOK:**

1. Quantitative Aptitude- R.S Aggarwal(chapter 15,17,18,19,21,22,27,28,32,33) S.Chand & Company LTD, New Delhi reprint 2011

| 2014-2015 Onwards | DTP PACKAGE (14U4CSS02) | B.Sc. (CS), BCA |
|---|---|---|
| IV Semester | | SBEC - II |
| Hours: 30 | | Credit : 3 |

**Objectives:**

To provide quality in the field of reasoning and to improve the ability towards recruitment.

**UNIT – I** **Hours: 06**

Introduction: Choosing the printing house - Hardware Requirement for DTP - General Design Considerations - Text Organization – Design Common Media Publication.

**UNIT – II** **Hours: 06**

Pagemaker: Getting Started with PageMaker – Working in PageMaker – The PageMaker window – Working with text – Multiple Text Block. Editing Text: Making Changing in the Publication – Searching by Format – Replacing the Text. Formatting Text: Changing the Font Size – Making the text bold – Removing Boldface from the text – Underlining the text – Aligning the text.

**UNIT – III** **Hours: 06**

Master pages: Adding Text to the Publication – Element on master pages – Creating a new Publication – Working with Columns. Managing and Printing a publication: Page Orientation – Page Numbering – Page Size – Dimension – Table of Contents – Managing Books – Printing a Publication.

**UNIT – IV** **Hours: 06**

Photoshop- Starting Photoshop CS2 - Photoshop Program Window Working with Images: Editing Images – Color Modes.

**UNIT – V** **Hours: 06**

Making Selections**:** Moving a Portion of Images – Editing Selections – Filling a Selection -Transforming Selections Painting Tools: Drawing Tools –Retouching Tools.

**TEXT BOOK**

1. “COMDEX-DTP Course Kit” Vikas Gupta, Dreamtech Publishers- New Delhi, 2008.

| Subject Title | JAVA PROGRAMMING | Semester | V |
|---|---|---|---|
| Subject Code | 14U5CSC05 | Specialization | NA |
| Type | Core – V | L:T:P:C | 5:0:0:5 |

**Objectives**

- **To understand the basics of Programming Languages.**
- **Improve the ability of Programming Skill.**
- **To achieve Multiprogramming concepts.**
- **Create an APPLET for Internet Applications.**

| Unit | Syllabus Contents | Number of Sessions |
|---|---|---|
| I | The Genesis of Java: Java's Lineage – Why Java is Important to Internet? – Java's Magic: The Byte Code – Java Buzzwords. An overview of Java: Object oriented programming – A First Simple Program – Lexical Issues. Data types, variables and arrays: The Simple Types – Integers – Floating point Types – Characters – Booleans – Literals – Variables – Type Conversion and Casting – Arrays. Operators: Arithmetic – Bitwise – Relational – Boolean Logical – Assignment – The Operator- Operator Precedence. Control Statements: Selection statements – Iteration statements – Jump statements. | 12 |
| II | Classes: Fundamentals- Objects – Methods – Constructors – The this keyword – Garbage Collection - finalize ( ) method – The Stack Class. Methods and Classes: Overloading methods – Objects as Parameters – Argument Passing - Returning objects – Recursion – Static – Final – Nested inner classes – Command line arguments. Inheritance: Basics – Using Super – Multilevel Hierarchy – Method Overriding – Abstract Classes – Using Final – Object Class. | 12 |
| III | Packages and Interfaces: Packages – Access protection – Importing packages – Interfaces. Exception handling: Fundamentals – Exception types – Try and catch – Multiple catch – Nested try – throw – throws – finally – Build in exception - Chained exception. | 12 |
| IV | Multithread programming: Thread model – The Main Thread - Life cycle of thread – Creating thread – Multiple threads. Graphics programming: The AWT classes - Window Fundamentals – Working With Graphics – Working with Color. AWT Controls: Control Fundamentals – Labels – Using Buttons – Checkboxes – Lists – Scroll Bars – Text Fields- Text Area. JDBC objects – the concept of JDBC – JDBC driver types – JDBC packages – A brief overview of the JDBC process – DB connection. | 12 |
| V | I/O, Applets And Other Topics: I/O Basics – Reading / Writing Console Input / Output – Applet Fundamentals. Applet Class: Basics – Architecture - Applet Skeleton – Display Methods - Repainting – The Status Window – HTML Applet Tag – Passing Parameters to Applet. | 12 |

| Learning Resources | |
|---|---|
| **Text Books** | 1. "The Complete Reference" Java2, 5th Edition, Herbert Schildt, Tata McGraw Hill Pub. Ltd., New Delhi – 49th Reprint 2014.<br>2. "The complete Reference J2EE – Jim Keogh, Tata McGraw Hill Pub. Ltd., New Delhi – Reprint 2010. |
| **Reference Books** | 1. Programming with Java, 3rd Edition, E. Balagurusamy, Tata McGraw Hill Pub. Ltd., New Delhi.<br>2. Y. Daniel Liang- Introduction to JAVA Programming, 6th edition, Pearson Education, 2007. |
| **Website / Links** | 1.http://www.codecademy.com/learn/learn-java<br>2.http://www.programmingsimplified.com/java-source-codes<br>3.http://courses.caveofprogramming.com/courses/java-for- complete-beginners. 4.http://www.oracle.com/technetwork/java/index-138747.html |

## Content beyond the Syllabus

1. Java's support in graphics, networking, web technology etc.
2. Exposure to Software Tools and IDEs for Design & Implementation.
3. Database transactions using multithreading.
4. JDBC connectivity to multiple DBMSs.

| Subject Title | Practical–IV<br>JAVA PROGRAMMING LAB | Semester | V |
|---|---|---|---|
| Subject Code | 14U5CSCP05 | Specialization | NA |
| Type | Core Practical - V | L:T:P:C | 0:0:5:6 |

**Objectives**

- **To create Java Programming skill and to sketch out the hidden talent of students community**.

## LIST OF PROGRAMS

1. Write a java program to generate Fibonacci series.
2. Write a java program to display tables from 1 to 10 using 2D Array.
3. Write a java program to create a class customer having three attributes name, bill and id. Include appropriate methods for taking input from customer and displaying its values.
4. Write a java program to show the concept of method overloading.
5. Write a java program to show the concept of multilevel inheritance.
6. Write a java program to create a class that will at least import two packages and use the methods defined in the classes of those packages.
7. Write a java program to create user defined exception.
8. Write a java program threat by extending the threat class.
9. Write a java program to demonstrate a sleep method in multithreading.
10. Write a java program to illustrate a Basic Applet.
11. Create an Applet program for recording student's information's.
12. Write a java program using JDBC concept.

| Subject Title | COMPUTER NETWORKS | Semester | V |
|---|---|---|---|
| Subject Code | 14U5CSC06 | Specialization | NA |
| Type | Core - VI | L:T:P:C | 5:0:0:5 |

**Objectives**

- **To understand the basics of Computer Networks.**
- **To understand the layers of computer Networks.**
- **Become familiar with the basics of computer network architectures and protocols**

| Unit | Syllabus Contents | Number of Sessions |
|---|---|---|
| I | **Introduction:** Business Applications - Home Applications – LAN – WAN-MAN- Protocol Hierarchies – Protocols and Standards-Connection Oriented and Connection less Services – OSI Reference Model. | 12 |
| II | **Physical Layer** Transmission Media: Guided Transmission media - Wireless Transmission - Communication Satellites - Public Switched Telephone Network. | 12 |
| III | **Data Link Layer:** Data Link Layer Design Issues - Error Detection and Correction – Elementary data link protocols - Sliding Window Protocols - Protocols Verification. | 12 |
| IV | **Network Layer:** Network Layer Design Issues. Routing Algorithms: Shortest Path- Link State – Distance Vector. Congestion Control Algorithms: Principles – Load Shedding. Internetworking: Tunneling – Fragmentation – IP Addresses – Protocols – OSPF. | 12 |
| V | **Transport Layer:** Transport Services – Elements of Transport protocols – **Application layer:** DNS– Electronic mail-World Wide Web. **Network Security:** Cryptography-Symmetric and Public-key algorithms-Digital signatures. | 12 |

| Learning Resources | |
|---|---|
| **Text Books** | 1. "Computer Networks" Andrew S. Tanenbaum, Fifth edition, PHI private Ltd, New Delhi , 2009. |
| **Reference Books** | 1. Behrouz A. Forouzan, " Data Communication and Networking", Tata MC- Hill, 2009. |
| **Website / Links** | https://en.wikipedia.org<br>www.tutorialspoint.com<br>https://www.coursera.org |

**Content beyond the Syllabus**

1. Basics of TCP/IP
2. Security Issues on Network
3. Overview of wireless networks

| Subject Title | COMPILER DESIGN | Semester | V |
|---|---|---|---|
| Subject Code | 14U5CSC07 | Specialization | NA |
| Type | Core - VII | L:T:P:C | 5:0:0:5 |

**Objectives**

- To introduce the major concept areas of language translation and compiler design.
- To enrich the knowledge in various phases of compiler and its use, code optimization techniques, machine code generation, and use of symbol table.
- To extend the knowledge of parser by parsing LL parser and LR parser.

| Unit | Syllabus Contents | Number of Sessions |
|---|---|---|
| I | Introduction to Compliers: Compliers and Translator – Need of Translator – The structure of a Complier – Lexical analysis – Syntax analysis – Intermediate code generation –Optimization – Code generation – Complier writing tools. Finite automata and lexical Analysis: The role of the lexical analysis – A simple approach to the design of lexical analyzers- Regular expressions to finite automata – Minimizing the number of states of a DFA. | 12 |
| II | The Syntactic specification of programming languages: Context free grammars –Derivations and parse trees - Capabilities of context free grammars. Basic parsing techniques: Parsers – Shift reduce parsing – Operator precedence parsing – Top down parsing – Predictive parsers. | 12 |
| III | Syntax directed translation: Intermediate code – Postfix notation – Parse trees and syntax trees – 3 address code – Quadruples and triples –Boolean expressions – Statements that alter the flow of control. Symbol tables: The contents of a symbol table – Data structures for symbol table – Representing scope | 12 |
| IV | Run time storage administration: Implementation of a simple stack allocation scheme –Implementation of block-structured languages. Error deduction and recovery: Errors – Lexical phase errors – Syntactic phase errors – Semantic errors. | 12 |
| V | Introduction of code optimization: The principle sources of optimization – Loop optimization – The DAG representation of basic blocks –Global data flow analysis. Code generation: Object programs – Problems in code generation–A simple code generator – Register allocation and assignment –Code generation from DAG‘s–Peepholes optimization. | 12 |

| Learning Resources | |
|---|---|
| **Text Books** | 1. Principles of Complier Design by Alfred V.Aho, Jeffrey D.Ullman , Narosa Publications House. |
| **Reference Books** | 1. Modern Compiler Design by David Galles, Fifth Edition 2012. |
| **Website / Links** | www.tutorialspoint.com<br>https://en.wikipedia.org<br>www.faadooengineers.com |

**Content beyond Syllabus**

1. Implementation of Lexical Analyzer
2. Translation of Assignment statement
3. Storage Allocation in Block structure language

| Subject Title | PHP PROGRAMMING | Semester | V |
|---|---|---|---|
| Subject Code | 14U5CSS03 | Specialization | NA |
| Type | SBEC - III | L:T:P:C | 2:0:0:2 |

**Objectives**

- **Understand the basics of PHP**
- **Understand the key OOPS concepts of PHP**
- **Understand to apply PHP in Web forms**

| Unit | Syllabus Contents | Number of Sessions |
|---|---|---|
| I | **Introduction to PHP:** History - General Language Features – PHP Basics: Embedding PHP Code in your Web Pages - Commanding Your Code - Output Data to the Browser - PHP's Supported Data Types . | 4 |
| II | Identifiers – Variables – Constants – Expressions –String – Interpolation. **Control Structures:** Conditional Statements - Looping Statements - File Inclusion Statements - **Functions**: Invoking a Function - Creating a Function - Function Libraries. | 4 |
| III | **Arrays:** Creating an Array - Adding and Removing Array Elements - Locating Array Elements - Traversing Array - Merging – Slicing - Splicing and Dissecting Array. **Object Oriented PHP.:** Benefits of OOP - Key OOPs Concepts . | 4 |
| IV | **Advanced OOPs Features:** Object Cloning - Inheritance Interfaces - Abstract Classes. Error and Exception: Error Logging - Exception Handling. | 4 |
| V | Strings and Regular Expression - Other String Specific Function - Alternatives for Regular Expression Functions**. Forms:** PHP and Web Forms. | 4 |

## Learning Resources

| | |
|---|---|
| **Text Books** | 2. "Beginning PHP and Oracle From Novoice to professional" W.Jason Gilmore and Bob Brylr edition – 2008 |
| **Reference Books** | 1. "Spring into PH5 the Small Professional choice" Steven Holzner, Pearson education, Edition: First Impression 2006. |
| **Website / Links** | www.w3schools.com<br>https://en.wikipedia.org<br>www.tutorialspoint.com |

**Content beyond the Syllabus**

1. PHP Script for simple Web page
2. PHP Script for Web forms
3. Simple Web application using PHP

| Subject Title | SOFT SKILLS | Semester | V |
|---|---|---|---|
| Subject Code | 14U5CAS04/14U5CSS04 | Specialization | NA |
| Type | SBEC- IV | L:T:P:C | 2:0:0:2 |

**Objectives**

- **To understand the importance of soft skill**
- **To improve the communication skill**
- **To plan the presentation skill**

| Unit | Syllabus Contents | Number of Sessions |
|---|---|---|
| I | **Nature of technical communication**: Communication as sharing – Stages of communication – Channels of communication – Nature of technical communication – Importance and need for technical communication – Technical communication skills. | 4 |
| II | **The Listening process**: Types of listening – Listening with a purpose – Barriers to listening –The speech process – Conversation and oral skills – Strategies for good conversation – Improving fluency and self-expression – Body language. | 4 |
| III | **Job interviews:** Interview process – Characteristics of job interview–Pre-interview preparation techniques – Interview questions – Answering strategies – Frequently asked interview questions – Projecting a positive image – Alternative interview formats. | 4 |
| IV | **Group Discussion**: Nature of group discussion – Characteristics of successful group discussions – Selection group discussion – Group discussion strategies – Techniques for individual contribution – Group interaction strategies. | 4 |
| V | **Presentation Skills**: Nature and importance of oral presentation –Planning the presentation – Preparing the presentation – Organizing your presentation – Rehearsing the presentation – Improving delivery. | 4 |

| Learning Resources | |
|---|---|
| Text Books | 1. Effective Technical Communication , M. Ashraf Rizvi, Tata McGraw – Hill Publishing Company Limited , New Delhi |
| Website / Links | https://en.wikipedia.org<br>https://bemycareercoach.com<br>www.mindtools.com |

**Content beyond the Syllabus**

1. Group discussion about child labour
2. Mock interview with students
3. Preparing presentation about social issues

| Subject Title | OPERATING SYSTEMS WITH UNIX | Semester | VI |
|---|---|---|---|
| Subject Code | 14U6CSC08 | Specialization | NA |
| Type | Core - VIII | L:T:P:C | 5:0:0:5 |

**Objectives**

- **To understand to basics of operating system**
- **To understand the process and memory management concept**
- **To apply the UNIX and LINUX basic commands**

| Unit | Syllabus Contents | Number of Sessions |
|---|---|---|
| I | Introduction: What is an Operating System?. History of Operation System- Types of Operating System. Operating System Concepts: Processes - Address Space - Files - Input/Output. Operating System Structure. Operating System Overview: Operating System Objectives and Functions - The Evaluation of Operating System - Major Achievements of Operating System. | 12 |
| II | Process Description and Control: What is Process? - Process States- Process Description - Process Control. Interprocess Communication: Race Conditions - Critical Regions - Mutual Exclusion with Busy Waiting - Sleep and Wakeup - Semaphores - Mutexes. Threads: Multithreading - Thread Functionality – Thread Usage - The Classical Thread Model. Deadlock and Starvation: Resources - Principles of Deadlock - Deadlock Detection and Recovery - Deadlock Avoidance and Prevention. | 12 |
| III | Memory Management: Memory Management Requirements - Memory Partitioning - Paging - Segmentation. Virtual Memory: Hardware and Control Structures. Operating System Software.Uniprocessor Scheduling: Types of Scheduling - Scheduling Algorithm. I/O Management and Disk Scheduling: I/O Devices - Organization of I/O Function - Operating System Design Issues - I/O Buffering. | 12 |
| IV | UNIX & LINUX: History of UNIX and LINUX: UNICS – PDP-11 UNIX – Portable UNIX – Standard UNIX – LINUX. Overview of LINUX: LINUX Goals – Interfaces of LINUX – The Shell – Linux utility Programs - Kernel Structure. Processes in LINUX: Fundamental Concepts – Process Management System Calls in LINUX – Implementation of Processes and Threads – Scheduling in LINUX - Booting in LINUX. | 12 |
| V | Memory Management in LINUX: Fundamental Concepts – Implementation of Memory Management in LINUX – Paging in LINUX – Input/Output in LINUX: Fundamental Concepts – Networking – I/O System calls in LINUX – Implementation of I/O in LINUX. Linux File System: Fundamental Concepts – File system calls in LINUX – Implementation of the Linux File System. Security in Linux: Fundamental Concepts – Security System calls in Linux – Implementation of Security in LINUX | 12 |

| Learning Resources | |
|---|---|
| **Text Books** | 1. "Operating Systems Internal and Design Principles", by William Stallings, Sixth Edition, PHI Private Limited, New Delhi, 2008.<br>2. "Modern Operating Systems", by Andrew S.Tanenbaum, Third Edition, PHI Private Limited, New Delhi, 2011. |
| **Reference Books** | 1. "Operating Systems a Concept Based Approach", by D M Dhamdhere, Second Edition, TMH Publishing Company Limited, New Delhi, 2006.<br>2. "Operating Systems", by Achyut S Godbole, Second Edition, TMH Publishing Company Limited, New Delhi, 2008.<br>3. "Operating System Concepts", by Silberschatz, Galvin and Gagne, Sixth Edition, John Wiley & Sons ,Inc 2002. |
| **Website / Links** | https://en.wikipedia.org<br>www.tutorialspoint.com<br>www.webopedia.com |

**Content beyond the Syllabus**

1. Processor Management Techniques
2. Implementation of LINUX File system
3. Storage management techniques

| Subject Title | Practical–VI<br>PROGRAMMING IN UNIX LAB (LINUX) | Semester | VI |
|---|---|---|---|
| Subject Code | 14U5CSCP06 | Specialization | NA |
| Type | Practical - VI | L:T:P:C | 0:0:5:6 |

**Objectives**

- **To improve the LINUX shell script skill of the students.**
- **To implement LINUX commands using C programming**

## LIST OF PROGRAMS

1. Write the shell script to check the status of file using test command.
2. Write the shell script to find the grade of student's marks.
3. Write a menu driven shell program to perform the following.
   i) Enter the sentence in file
   ii) Search a whole worded in an existing file.
4. Write a shell script to perform case conversion.
5. Write a shell script to find the sum of digits.
6. Write a shell script to find the biggest of three numbers using command line arguments. Check for sufficient number of command line arguments.
7. Write a shell script to copy, delete and renaming a file.

**Linux (Using C):**

8. Implementation of system calls – Open, read and close.
   create, write, lseek, stat, fstat.
9. Implementation of fork & exec.
10. Reverse the String Tokens using awk Commands in UNIX.

| Subject Title | PROJECT WORK (IN-HOUSE MINI PROJECT) | Semester | VI |
|---|---|---|---|
| Subject Code | 14U6CSPR01 | Specialization | NA |
| Type | Core-IX | L:T:P:C | 0:0:5:6 |

**Objectives**

1. **To understand the problem in clear and concise mode**
2. **To know how to connect the statement with the problem**
3. **Usage of features of programming language in project.**
4. **Design the whole project**

## PROJECT WORK PATTERN

1 **FIRST REVIEW:** **(20 Marks)**

5. Project Title
6. Project Platform (Language / Package Selected )
7. Confirmation Letter (from Company / Industry)
8. Details of Internal Guide with Designation & Qualification (in the company / Industry)
9. Presentation

**SECOND REVIEW:** **(20 Marks)**

1. Work Observation
2. Modules in Project (Design Screens Sample)
3. DFD / ERD / System Flow Diagram ( Whichever Applicable)
4. Estimated Time of Completion
5. Completed Work in the form of Percentage Analysis
6. PowerPoint Presentation.

**FINAL REVIEW:** **(60 Marks)**

1. Documentation
2. Screens Shots
3. DFD / ERD / System Flow Diagram ( Whichever Applicable)
4. Final Project Report ( with executable format including complete source code)

**The Passing minimum shall be 40% out of 60 marks (24 Marks)**

| Subject Title | JAVA and VB SCRIPT | Semester | VI |
|---|---|---|---|
| Subject Code | 14U6CSS05 | Specialization | NA |
| Type | SBEC-V | L:T:P:C | 2:0:0:2 |

**Objectives**

- **To understand the essentials of Java script**
- **To understand the features of VB script**
- **To improve the web designing skill of the students**

| Unit | Syllabus Contents | Number of Sessions |
|---|---|---|
| I | Understanding JavaScript: Learning Web Scripting Basics – How Java Script fits into a Web page - Browsers and JavaScript. Creating Simple Scripts : Tools for Scripting – Beginning the Script – Adding JavaScript Statements – Creating Output. | 4 |
| II | Using Variables, String and Arrays: Using Variables – Expressions and Operators - Data Types in JavaScript – String Objects – Using Numeric and String Arrays. Functions and Objects: Using Functions – Introducing Objects – Using Objects to simplify Scripting – Extending Built-in Objects. | 4 |
| III | Controlling Flow with Conditions and Loops : The if Statement – Using Shorthand Conditional Expressions – Testing Multiple Conditions with If and Else – Using Multiple Conditions with switch – Using for Loops – Using While Loops – Using Do . . . While Loops. Using Built-in Functions and Libraries: Using the Math Object – Working with Math Functions. | 4 |
| IV | What VB Script Is and Isn't?: VB Script is Scripting Language-Advantage of using VB Script-VBScript Fits in with the Visual Basic Family-What Can You Do with VBScript? Data Types: The Variant, VBScript's Only Data Type-Arrays as Complex Data Types. Variables and Procedures: Naming Variables-Procedures and Functions-By Ref and By Val. | 4 |
| V | Error Handling and Debugging: Types of Errors-Error Visibility and Context-Handling Errors. Classes in VBScript (Writing Your Own COM Objects): Objects, Classes, and Components-The Class Statement- Defining Properties-Defining Methods- Class Events. | 4 |

| Learning Resources | |
|---|---|
| **Text Books** | 1. Teach Yourself Java Script in 24 Hours by Michael Moncur, Fourth Edition, published by Pearson Education.<br>2. VB Script Programmer's Reference by Adrian Kingsley-Hughes, Kathie. Kingsley-Hughes, Daniel Read, Wrox Publishing, Third Edition 2007. |
| **Website / Links** | www.w3schools.com<br>www.tutorialspoint.com<br>https://msdn.microsoft.com |

**Content beyond the Syllabus**

1. Simple Web page using Java Script
2. Develop interface using VB Script
3. Prepare simple Web Application

| Subject Title | MULTIMEDIA | Semester | VI |
|---|---|---|---|
| Subject Code | 14U6CSS06 | Specialization | NA |
| Type | SBEC-VI | L:T:P:C | 2:0:0:2 |

**Objectives**

- **To understand the various features of flash**
- **Exercise the students with simple flash applications**
- **To understand the animation techniques**

| Unit | Syllabus Contents | Number of Sessions |
|---|---|---|
| I | Introducing Flash: How Flash works-Uses of Flash –obtaining Flash-Installing Flash-The Flash Environment-Getting Started: The Timeline-The Stage-Tools and toolbars. The Menu bar-Properties Inspector-Panels-Viewing options-Quick start templates-Accessibility creating Objects: stage and overlay objects-Tools panel. | 4 |
| II | Editing Objects: Grouping objects-Free Transform tool-Reshaping objects-Aligning objects. Pixel snapping –Stacking order-Cut aways-Paste in place. Color and Text: Standard Color palette- Adding solid colors –Adding gradients-Fill transform tool-More color options-selecting colors –Adding, Formatting and Manipulating text. | 4 |
| III | Symbols and Instances: Definitions- The Library-Converting objects to symbols-Creating a new symbol-Symbol Editing Mode-Editing symbols-Editing Instances. Sound and Video: Using sound –Importing sound-Editing sounds, Adding video-Manipulating video. | 4 |
| IV | Frames and Layers: Working with frames-Adding frames-Deleting and copying frames-Frame properties- Working with layers- Inserting layers- Deleting and copying layers. | 4 |
| V | Animation: Elements of animation-Scenes-Frame-by-Frame animation-Motion tweening-Motion guides-Shape tweening-Animation text-Distribute text to layers-Movie clips. | 4 |

## Learning Resources

| | |
|---|---|
| **Text Books** | 1. "Flash Mx In Easy Steps" –Nick Vandome, New Delhi. |
| **Website / Links** | https://en.wikipedia.org<br>www.webopedia.com |

**Content beyond the Syllabus**

1. Create flash clip for simple animation
2. Create multimedia flash clip
3. Implement features of flash for simple multimedia application

| Subject Title | GRID COMPUTING | Semester | V |
|---|---|---|---|
| Subject Code | 14U5CSE01 | Specialization | NA |
| Type | Elective-I | L:T:P:C | 5:0:0:5 |

**Objectives**

- To understand the concept of grid computing
- To know the application of grid computing
- To understanding the technology and tool kits to facilitated the grid computing

| Unit | Syllabus Contents | Number of Sessions |
|---|---|---|
| I | **GRID COMPUTING** : Introduction – Early and Current Grid activities-Grid Business areas-Grid Applications- Grid Infrastructure | 12 |
| II | **GRID COMPUTING INITIALIVES:** Grid Computing Organizations and their Roles: Organization s developing Grid standards, best practice guidelines, Global grid forum (GGM), Grid Computing Toolkits and the frameworks– Grid based solutions to solve computing.. The Grid computing Anatomy: Grid Architecture-Relationship to other distributed Technologies. The Grid computing Road map. | 12 |
| III | **GRID COMPUTING APPLICATIONS**: Merging the Grid Services Architecture with the Web Devices Architecture: Service oriented Architecture- e Web service, SOAP .Service message description Mechanisms-Relationship between web service and grid service. | 12 |
| IV | **GRID COMPUTING TECHNOLOGIES**: Open grid service architecture – Use cases that drive the OGSA – Sample use cases – The OGSA platform components – Open grid service infrastructure (OGSI) – OGSA Basic Services. | 12 |
| V | **GRID COMPUTING TOOL KITS**: Globus GT3 Toolkit – Architecture - Programming model, - A Sample implementation- High level services: Introduction-Information service Index services-Resource information provider Services- Resource management service –Data Management service. | 12 |

## Learning Resources

| | |
|---|---|
| **Text Books** | 1. Joshy Joseph & Craig Fellenstein, "Grid Computing", PHI, PTR-2013. |
| **Website / Links** | www.gridcomputing.com.<br>www.cloudbus.org/reports<br>https://www.redbooks.ibm.com |

**Content beyond Syllabus**

1. Applications of Grid Computing.
2. Advanced Grid Planning and Operation
3. Power Grid Technology

| Subject Title | SOFTWARE ENGINEERING | Semester | V |
|---|---|---|---|
| Subject Code | 14U5CSE02 | Specialization | NA |
| Type | Elective I | L:T:P:C | 5:0:0:5 |

**Objectives**

- **To understand the process clearly**
- **To understand the phases of software project designing**
- **To create the project within budget and time**

| Unit | Syllabus Contents | Number of Sessions |
|---|---|---|
| I | Software and Software Engineering: The nature of software – software engineering – The software process – Software myths. Process models: A generic process model – Process assessment and improvement – Prescriptive process models – Specialized process model – The unified process model. Agile Development: Agile process – Extreme programming – Agile process models and tool set. | 12 |
| II | Understanding Requirements: Requirement engineering – Eliciting requirement – Developing use cases – Requirements model – Negotiating and Validating requirements. Requirement Modeling: Scenarios, Information and Analysis Classes. – Flow, behavior and Patterns. | 12 |
| III | Design Concept: The design process – Design concept – Design model. Architectural Design: Software architecture – Architectural design – Alternative architectural design – Architectural mapping using data flow. Component level design – User Interface design – Pattern based design. | 12 |
| IV | Quality Management: Software quality – Software quality dilemma – Achieving software quality. Review techniques: Review metrics and its use – Informal reviews - Formal technical reviews. Software quality assurance: Elements of software quality assurance – SQA task, Goals and metrics – Software reliability – SQA plan. Software Testing strategies. Software Configuration Management. | 12 |
| V | Managing Software project: Project management concept – Process and Project metrics – Estimation for software project – Project Scheduling – Risk Management – Maintenance and Reengineering. | 12 |

| Learning Resources | |
|---|---|
| **Text Books** | Software Engineering A Practitioner's approach, R. S. Pressman, 2010, 7th Edition, Tata McGraw-Hill, New Delhi. |
| **Reference Books** | 1. "Software Engineering: Principles and Practices" Hans Van Vliet, –, 2008.<br>2. "Software Engineering Concepts", Richard Fairley, 2008. |
| **Website / Links** | http://www.mhhe.com/pressman<br>https://en.wikipedia.org<br>www.tutorialspoint.com |

**Content beyond Syllabus**

1. declare the project SDLC pattern
2. create testing tools for software project
3. post and pre maintenance issues in software development

| Subject Title | MIDDLEWARE TECHNOLOGIES | Semester | V |
|---|---|---|---|
| Subject Code | 14U5CSE03 | Specialization | NA |
| Type | Elective -I | L:T:P:C | 5:0:0:5 |

**Objectives**

- **To understand the concept of Client Server computing**
- **To understand the importance of CORBA**
- **To understand the .Net concepts**

| Unit | Syllabus Contents | Number of Sessions |
|---|---|---|
| I | Introduction to client server computing: Evolution of corporate computing models from centralized to distributed computing, client server models. Benefits of client server computing, pitfalls of client server programming. | 12 |
| II | CORBA with Java: Review of Java concept like RMI, RMI API, JDBC. Client/Server CORBA-style, The object web: CORBA with Java. | 12 |
| III | Introducing C# and the .NET Platform; Understanding .NET Assemblies; Object –Oriented Programming with C#; Callback Interfaces, Delegates, and Events. | 12 |
| IV | Building c# applications: Type Reflection, Late Binding, and Attribute-Based Programming; Object Serialization and the .NET Remoting Layer; Data Access with ADO.NET; XML Web Services. | 12 |
| V | Core CORBA / Java: Two types of Client/ Server invocations-static, dynamic. The static CORBA, first CORBA program, ORBlets with Applets, Dynamic CORBA-The portable count, the dynamic count multicount. | 12 |

| Learning Resources | |
|---|---|
| Text Books | 1. Client/Server programming with Java and CORBA Robert Orfali and Dan Harkey, John Wiley & Sons ,SPD 2nd Edition , 2010<br>2. Java programming with CORBA 3rd Edition, G.Brose, A Vogel and K.Duddy, Wiley-dreamtech, India John wiley and sons, 2003 |
| Reference Books | 1. Qusay H. Mahmoud, “Middleware for Communications”, John Wiley and Sons, 2004.<br>2. Gerald Brose, Andreas Vogel, Keith Duddy, “JavaTM Programming with ORBATM: Advanced Techniques for Building Distributed Applications”, Wiley, 3rd edition, January, 2004. |
| Website / Links | https://en.wikipedia.org<br>https://www.mulesoft.com<br>https://apprenda.com |

**Content beyond the Syllabus**

1. Client server computing technologies
2. .Net framework
3. Types of client server computing

| Subject Title | MULTIMEDIA AND ITS APPLICATIONS | Semester | VI |
|---|---|---|---|
| Subject Code | 14U6CSE04 | Specialization | NA |
| Type | Elective II | L:T:P:C | 5:0:0:5 |

**Objectives**

- **To understand the concept of multimedia**
- **To improve the multimedia skill of the students**
- **To develop simple multimedia project**

| Unit | Syllabus Contents | Number of Sessions |
|---|---|---|
| I | Introduction to making Multimedia- Multimedia Skills and training- Text: Using text in Multimedia-Computer and Text- Font Editing and Design Tools- Hypermedia and Hypertext. | 12 |
| II | Images: Making Still Images – Color – Image File Formats. Sound: The Power of Sound – Digital Audio –Midi Audio – Midi vs. Digital Audio – Multimedia System Sounds – Audio File Formats – Adding Sound to Multimedia Project. | 12 |
| III | Animation: Principles of Animation – Animation by Computer –Making Animations that Work.Video: Using Video – Working with Video and Displays –Digital Video Containers – Obtaining Video Clips – Shooting and Editing Video. | 12 |
| IV | Multimedia Hardware: Macintosh and Windows production platforms- Hardware Peripherels: Memory and Storage Devices, Input Devices, Output Devices, Communication Devices .Basic Software Tools. | 12 |
| V | Multimedia application design: Multimedia application classes- Types of multimedia system- Virtual Reality design- Components of Multimedia Design- Organizing Multimedia Databases. | 12 |

| Learning Resources | |
|---|---|
| Text Books | 1. **Multimedia**: Making It Work, Tay Vaughan, 8th Edition,2011. Tata Mc-Graw Hill.<br>2. **Multimedia Systems Designs**,Prabhat K. Andeleigh, Kiran Thakrar, PHI Private Limited, New Delhi 2008 |
| Website / Links | https://en.wikipedia.org<br>www.indiastudychannel.com<br>https://prezi.com |

**Content beyond the Syllabus**

1. Multimedia resources
2. The use of multimedia in advertisement world
3. The use of multimedia in web page development

| Subject Title | SYSTEM ANALYSIS AND DESIGN | Semester | VI |
|---|---|---|---|
| Subject Code | 14U5CSE05 | Specialization | NA |
| Type | Elective-II | L:T:P:C | 5:0:0:5 |

**Objectives**

- **To understand the concept of system analysis and design**
- **To understand the system development life cycle**
- **To understand the testing tools**

| Unit | Syllabus Contents | Number of Sessions |
|---|---|---|
| I | System Concepts & Information System Environment: System concepts - definition, characteristics of a system, Elements of a system, Types of a System, introduction to System Analysis and Design - System Analysis, System Design, System Development Life Cycle. | 12 |
| II | The Information System Analysis**:** Introduction - where does the system analysis come from? - What does it do? - Preparing for Career as a System Analyst - General Business Knowledge - Technical Skills - Communication skills - Role of System Analyst - Change Agent - Investigator and Monitor - Psychologist, Sales Person, Motivator, Politician, and Place of the System analyst position in the MIS organization. | 12 |
| III | System Analysis: Problems who System Development Life Cycle approach, Need for a Structured approach, Information Gathering. A problem solving approach - Data Flow Diagrams, Data modeling with logical entity relationship. Process modeling with logical data flow diagram, Data dictionary, Decision Tree, Decision tables and Structured English. | 12 |
| IV | System Design: Introduction, The Process of Logical & Physical design - Modern Computer Databases - Different kinds of databases - E-R models - E-R diagrams - Normalization. Computer outputs and controls, computer inputs and controls, Code design, Computer based methods, procedures and controls. | 12 |
| V | System Implementation: System testing Conversion Compating resistance to change Post Implementation review Software maintenance Hardware/Software Selection Security disaster/ recovery and ethics in System development. | 12 |

| Learning Resources | |
|---|---|
| **Text Books** | 1. "System Analysis and Design" by Elias M.Awad, Second Edition, Golgotha Publication Private Limited, 2008 |
| **Reference Books** | 1. "System Analysis and Design" - Jerry L.Whitten, Lonnie D.Bently & Victor M.Bar, Seventh Edition, TMH Publishing Company Limited, New Delhi, 2008.<br>2. "System Analysis and Design" –K.Kendall & J. Kendall, Pearson Education, 2002. |
| **Website / Links** | https://en.wikipedia.org<br>https://www.youtube.com<br>www.freevideolectures.com |

**Content beyond the Syllabus**

1. Input/Output interface of the system
2. Interpret problem into design
3. ER diagram for different software process

| Subject Title | SOFTWARE TESTING | Semester | VI |
|---|---|---|---|
| Subject Code | 14U6CSE06 | Specialization | NA |
| Type | Elective II | L:T:P:C | 5:0:0:5 |

**Objectives**

- **To understand the software testing design techniques**
- **To create effective testing methods**
- **To understand web based application testing**

| Unit | Syllabus Contents | Number of Sessions |
|---|---|---|
| I | Building a Software Testing Strategy – Software Testing Design Techniques – Software Testing Tools and Selection of Test Automation Products – Software Testing Lifecycle and Software Testing Process | 12 |
| II | Testing Effort Estimation and Test Planning – Software Test Effort Estimation Technique – Pre-Development Testing Requirements and Design Phase – Best Practices in Program Phase Unit, System and Integration Testing. | 12 |
| III | A Case Study on Acceptance Testing – Implementation an Effective Test Management Process – Building an Effective Test Organization – Performance Issues and Optimization Techniques. | 12 |
| IV | Choosing a Load Testing Strategy – Dodging the Bullets – Validating Mission-Critical Server Software for Reliability – Probing the Blind Spot – Testing in Today's Business and Usability | 12 |
| V | Testing of Web-based Applications – Testing of Embedded Software System used in Aerospace Applications – Testing Application for Security – Testing Metrics, Best Practices and Benchmarks. | 12 |

| Learning Resources | |
|---|---|
| Text Books | 1. **"Software Testing Effective Methods, Tools and Techniques"** by Renu Rajani and Pradeep Oak, Tata McGraw-Hill, 9th Reprint 2009. |
| Reference Books | 1. **"Software Testing Principles and Practices"** by Srinivasan Desikan & Gopalaswamy Ramesh, Pearson Education, Sixth Impression, 2008. |
| Website / Links | https://en.wikipedia.org<br>www.tutorialspoint.com<br>www.istqb.org |

**Content beyond the Syllabus**

1. Test tools
2. Various type of testing
3. Need of software testing

| Subject Title | WEB TECHNOLOGIES | Semester | VI |
|---|---|---|---|
| Subject Code | 14U6CSE07 | Specialization | NA |
| Type | Elective - III | L:T:P:C | 5:0:0:5 |

**Objectives**

- **Use CSS to implement a variety of presentation effects in HTML and XML documents, including explicit positioning of elements.**
- **Install a web server application.**
- **Deploy Java Applets and Servlets**
- **Create an XML application.**

| Unit | Syllabus Contents | Number of Sessions |
|---|---|---|
| I | TCP/IP: TCP/IP Basics- Why IP address- Logical Address- TCP/IP Example- The concept of IP address- Basics of TCP-Features of TCP-Relationship between TCP and IP – Ports and Sockets- Active Open and Passive Open-TCP Connections-What makes TCP reliable?-TCP segment format-Persistent TCP connections-UDP-Differences between TCP and UDP. | 12 |
| II | DNS - E-mail - FTP – TFTP - History of WWW - Basics of WWW and Browsing - HTML- Web Browser Architecture - Common Gateway Interface - (CGI) - Remote Login(TELNET). | 12 |
| III | Introduction to Web Technology : Introduction - Popular Web Technologies- What is ASP.NET?- An Overview of the .NET framework-ASP .NET details- Server Controls and Web Controls- Validation Controls- Database Processing- ActiveX Controls. | 12 |
| IV | Java Web Technologies: Introduction to Servlets and JSP- Servlet Advantages- Servlet Examples- Introduction to JSP- Elements of a JSP page- JavaBeans-JSP and JDBC- APACHE STRUTS-JAVA APPLETS-Why are Active Web Pages Powerful?-When not to Use Active Web Pages?- Life Cycle of JAVA Applets. | 12 |
| V | Introduction to XML: What is XML? - XML versus HTML –Electronic Data Interchange (EDI)-XML Terminology-Introduction to DTD-Document Type Declaration- Element Type Declaration- Attribute Declaration-XSLT. | 12 |

| Learning Resources | |
|---|---|
| **Text Books** | 1. WEB TECHNOLOGIES TCP/IP Architectures, and Java Programming- Achyut S Godbole & Atul Kahate Second Edition. |
| **Reference Books** | 1. Internet and World Wide Web – How to program by Dietel and Nieto PHI/Pearson Education Asia.<br>2.Internet And Web Technologies – Rajkamal, TMH.<br>3.Web Applications Concepts and Real world Design – Craig D. Knuckles, David Yuen. |
| **Website / Links** | http://www.xml-sitemaps.com/<br>http://www.labnol.org/internet/google-web-scraping/28450/<br>http://newrelic.com/server-monitoring<br>http://seositecheckup.com/ |

**Content beyond the Syllabus**

1. AJAX
2. Web Security
3. Web Services and Middleware

| Subject Title | CLIENT SERVER TECHNOLOGY | Semester | VI |
|---|---|---|---|
| Subject Code | 14U6CSE08 | Specialization | NA |
| Type | Elective III | L:T:P:C | 5:0:0:5 |

**Objectives**

- **To understand the concept of client server computing**
- **To understand interface technology in client server computing**
- **To understand the use of client server in Networking**

| Unit | Syllabus Contents | Number of Sessions |
|---|---|---|
| I | Introducton: Client/Server Computing – Advantages of Client / Server Computing – Technology Revolution – Connectivity – Ways to improve Performance – How to reduce network Traffic. | 12 |
| II | Components of Client/Server Applications – The Client: Role of a Client – Client Services – Request for Service. The Server: The Role of a Server – Server Functionality in Detail – The Network Operating System –What are the Available Platforms – The Server Operating system. | 12 |
| III | Components of Client/Server Applications – Connectivity: Open System Interconnect –Communications Interface Technology– Interprocess communication– WAN Technologies. | 12 |
| IV | Client/Server System Development–Software: Factors Driving demand for application software development – Rising Technology Staff costs – Need to improve Technology – Need for Common Interface across Platforms – Client/Server System Development Methodology. Hardware: Hadware/Network Acquisition – PC-Level Processing Units – Machintosh, notebooks, Pen –UNIX Workstation – x-terminals – Disk, Tape, Optical Disks, NIC and UPS. | 12 |
| V | Client/Server System Development–Service and Support: System Administration- Training advantages of GUI Applications. The Future of Client/Server Computing: Enabling Technologies – Transformational Systems. | 12 |

| Learning Resources | |
|---|---|
| **Text Books** | 1. Client/Server Computing – Patrick Smith, Steve Guenferich , 2nd edition, Prentice Hall of India Private Limited, New Delhi. |
| **Reference Books** | 1. Client Server Computing, 2nd edition- Drawna Travis Dewier.<br>2. Client Server survival Guide, 3rd edition- Robert Offali, Dan Harkey, Jeri Edwards |
| **Website / Links** | https://en.wikipedia.org<br>www.webopedia.com<br>www.encyclopedia.com |

**Content beyond the Syllabus**

1. applications of client server computing
2. client server system methodologies
3. the capabilities of server

| Subject Title | ANDROID APPLICATIONS | Semester | VI |
|---|---|---|---|
| Subject Code | 14U6CSE09 | Specialization | NA |
| Type | Elective - III | L:T:P:C | 5:0:0:5 |

**Objectives**

1. To understand the concept of Android Technology.
2. To understand applications of android.
3. To understand android web apps.

| Unit | Syllabus Contents | Number of Sessions |
|---|---|---|
| I | Introduction to Open Source: What is Open Source- License Issues (MPL, GPL, and LGPL) and Open Source Vs Traditional Development Methodologies. Introduction to Android: Introducing Android-History of Mobile Software Development-Open Handset Alliance-the Android Platform-Layers of Android-Android SDK-Kinds of Android Components-Building a Sample Android Application. | 12 |
| II | Android Application Design Essentials: Anatomy of an Android Applications-Android Terminologies- Application Context-Actives - Services-Intents-Receiving and Broadcasting Intents-Android Manifest File and its common settings-Using Intent Filter-Permissions-Managing Application resources in a hierarchy-Working with different types of resources. | 12 |
| III | Android Application Design Essentials: User Interface Screen Elements-Designing User Interfaces with Layouts- Drawing and Working with Animation. | 12 |
| IV | Using Common Android APIs:Using Android Data and Storage APIs-Managing data using SQLite-Sharing Data between Applications with Content Providers-Using Android Networking APIs-Using Android Web APIs and Using Android Telephony APIs. | 12 |
| V | DDMS-Debug and Other View:DDMS - Dalvik Debug Monitor Server-LogCat View-File explorer-Breakpoints and Debug. | 12 |

| Learning Resources | |
|---|---|
| **Text Books** | 1. Lauren Darcey and Shane Conder, "Android Wireless Application Development", Pearson Education, 2nd Edition, 2011.<br>2. W. Frank Ableson, Robi Sen, Chris King, "Android in Action", 2nd Edition, Manning Publications Co., 2011. |
| **Reference Books** | 1. Chris Haseman, "Android Essentials", Apress Publications, 2008.<br>2. James Steele, Nelson To, "The Android Developer's Cookbook-Building Applications with the Android SDK", Addison-Wesley Publications, 2011. |
| **Web Sites / Links** | www.developer.android.com<br>www.android.com<br>www.source.android.com |

**Content beyond the syllabus:**

1. Advanced android based applications
2. Scope of Android
3. Android application for education