Appendix-H-23
MADURAI KAMARAJ UNIVERSITY
(University with Potential for Excellence)
Directorate of Distance Education

Syllabus for B.C.A. (Semester Pattern)
(Bachelor of Computer Application)
(With effect from the academic year 2019-2020 onwards)

Regulations, Scheme of Examinations and Syllabus

1. **About the Department :** The Department of Computer Science in the Directorate of Distance Education of Madurai Kamaraj University is one of the oldest department in the Directorate started in late 1970s. The department currently offers both P.G. and U.G programs in Computer Science.

2. **Program Overview :** The B.C.A. program (Bachelor of Computer Application) at the Directorate is a conventional program focusing on Information Technology. It stresses the development of applied analytic tool skills, advanced cognitive abilities, and topical specialties allowing students to tailor the program to their interest.

3. **Objectives of the Program :**
   a) To prepare the students to manage the software components in a computer independently and to be a Programmer.
   b) To motivate the students to take up higher studies in Computer Application and other streams.

4. **Program Target Groups :** The Program may be structured in a way to attract aspirants of system programmer, Software industries, Program Analyst, Data – Operator Software development, IT, Banking, Consultancies etc.

5. **Program Requirements : Educational Qualification**
   B.C.A (Bachelor of Computer Application)

   Eligibility: A Candidate should have studied +2 Mathematics, with Physics/Commerce/ Economics in the 10 +2 stream.
   Duration of the Programme   : 3 Years
   Medium of instruction   : English

6. A student must have passed in his/her Higher Secondary Course (+2) pass with Computer Science (or) Mathematics.

7. **Degree Overview :** B.C.A. is a **3 year undergraduate** program which deals with subjects and topics related to computer application and services. Technological implementation of computer systems is the main agenda of the program. The program ranges widely from creating quality professionals and research fellows who are working in every sector of the world today.

8. **Degree Title: Bachelor of Computer Application**

9. **Program Structure**   :   See Appendix – CA1
   10.Pattern of Semester Exam   :   **S**ee Appendix – CA2
10. **External Exam**

     See Appendix – CA2
   - There shall be external examinations at the end of each semesters, odd semesters in the month of October / November and even semesters in April / May.

   - A candidate, who has not passed the examination, may be permitted to appear in such failed subjects in the subsequent examinations to be held in October / November or April / May. A candidate should get registered for the first semester examination. If registration is not possible, owing to shortage of attendance beyond condonation limit / regulation prescribed OR belated joining OR on medical grounds, the candidates are permitted to move to the next semester. Such candidates shall re-do the missed semester after the completion of the Programme.

   - Students must have earned 75% of attendance in each course for appearing for the examination. Students who have earned 74% to 70% of attendance have to apply for condonation in the prescribed form with the prescribed fee. Students who have earned 69% to 60% of attendance have to apply for condonation in the prescribed form with the prescribed fee along with the Medical Certificate.

   - Students who have below 60% of attendance are not eligible to appear for the examination. They shall re-do the semester(s) after the completion of the Programme. The results of all the examinations will be published through the controller of examinations where the students underwent the course as well as through University Website. In the case of private candidate, the results will be published through the controller of examinations in which they took the examinations as well as University Website.

10. **Question Paper Patten** : See Appendix – PCA2

11. **Scheme of Evaluation :** The performance of a student in each course is evaluated in terms of percentage of marks with a provision of conversion to grade points. Evaluation of each course shall be done by a continuous internal assessment by the concerned Course Teacher as well as by an end semester examination and both will be consolidated at the end of the course.

     A mark statement with

     $$CCPA = \frac{\Sigma \text{ (marks X credits)}}{\Sigma \text{ (Credits)}}$$

   Where the summations cover all the papers appeared up to the current semester.

12. **Passing Minimum:**

A candidate passes the B.C.A., by scoring a minimum of 40% (internal + external) in each paper of the course. No minimum marks for internal assessment. External minimum for external assessment is 35% i.e., 27 out of 75.

13.1 Classification:

Sl. No.	Range of CCPA	Class
1.	50 & above but below 60	II
2.	60 & above	I

14. **Model Questions :** One Model question paper is displayed at the end the regulation

15**. Teaching Methodology:**

Each subject is designed with lectures/ tutorials/ seminar/ peer- team-teaching / PPT presentation / assignments etc., to meet the effective teaching and the learning requirements.10% of the course content must be taught through peer team teaching methodology.

16. **Text Books:** List of all the text books is quoted at the end of the syllabus of each subject

17. **Reference Books :** The list of all the reference books is followed by the list of text books. This list contains at least two books for each subject.

18. **Retotaling and Revaluation Provision :** Candidate may apply for retotaling and revaluation within ten days from the date of the result published in the university website along ten with the required forms and fees.

19. **Transitory Provision :** The candidate of previous scheme may be permitted to write exams in their own schemes up to the examinations of April 2020 as a transitory provision.

20. **Subjects and Paper related websites :** All the subject details along with syllabus may be downloaded from the university website **www.mkudde.org**

See Appendix – CA1

Subject/Structure of Course Study

Sem.						Total Hours ( )	Total Credits[ ]
I	T1(6) [3]	E1(6) [3]	CS1(4) [4]	CS2(6) [4]	AS1(4) [4]	26	18
II	T2(6) [3]	E2(6) [3]	CS3(4) [4]	CS4(6) [4]	CS5(4) [4]	24	18
III	T3(6) [3]	E3(6) [3]	CS6(4) [4]	CS7(4) [3]	AS2(4) [4]	24	17
IV	T4(6) [3]	E4(6) [3]	CS8(4) [4]	CS9(4) [4]	CS10(4) [3]	24	17
V	CS11(5) [4]	CS12(5) [4]	CS13(5) [4]	CS14(6) [4]	--	21	16
VI	CS15(5) [4]	CS16(5) [4]	CS17(5) [4]	ES1(5) [5]	--	20	17

Total No. of Hours: 129   **Total No. of Credits: 103**

Abbreviations:

( )	–	Number of Hours	[ ]	–	Number of Credits
T	-	Tami	E	-	English
CS	-	Core Subject	AS	-	Allied Subject
ES	-	Elective Subject			

I SEMESTER

S No	Code	Subject	Hours	Credits	Internal Marks	External Marks
1	T1	Part-I : Tamil/Alternate Subjects	6	3	25	75
2	E1	Part-II : English	6	3	25	75
3	CS1	Fundamentals of Computer and C Programming	4	4	25	75
4	CS2	**Lab 1** : Programming in C	6	4	40	60
5	AS1	Discrete Mathematics	4	4	25	75
		Total	26	18		

II SEMESTER

S No	Code	Subject	Hours	Credits	Internal Marks	External Marks
1	T2	Part- I : Tamil/Alternate Subjects	6	3	25	75
2	E2	Part-II : English	6	3	25	75
3	CS3	Object Oriented Programming with C++	4	4	25	75
4	CS4	**Lab 2:**Problem solving using C++	6	4	40	60
5	CS5	Digital Principles and Computer organization	4	4	25	75
		Total	26	18		

III SEMESTER

S No	Code	Subject	Hours	Credits	Internal Marks	External Marks
1	T3	Part-I : Tamil/Alternate Subjects	6	3	25	75
2	E3	Part-II : English	6	3	25	75
3	CS6	Java Programming	4	4	25	75
4	CS7	**Lab 3**: Java Programming	4	3	40	60
5	AS2	Computer based Financial accounting	4	4	25	75
		Total	24	17		

IV SEMESTER

S No	Code	Subject	Hours	Credits	Internal Marks	External Marks
1	T4	Part-I : Tamil/Alternate Subjects	6	3	25	75
2	E4	Part-II : English	6	3	25	75
3	CS8	Operating System	4	4	25	75
	CS9	Data Structures and Computer Algorithms	4	4	25	75
4	CS10	**Lab 4**: Data Structures and Computer Algorithms	4	3	40	60
		Total	24	17		

V SEMESTER

S No	Code	Subject	Hours	Credits	Internal Marks	External Marks
1	CS11	Database Management Systems	5	4	25	75
2	CS12	Software Engineering	5	4	25	75
3	CS13	Dot Net Programming	5	4	25	75
4	CS14	**Lab 5** : Dot Net Programming(VB.Net)	6	4	40	60
		Total	21	16		

VI SEMESTER

S No	Code	Subject	Hours	Credits	Internal Marks	External Marks
1	CS15	Computer Networks	5	4	25	75
2	CS16	Web Programming	6	4	25	75
3	CS17	**Lab 6** : Web Programming	5	4	40	60
4	ES1	Project Work / Viva-Voce	5	5	40	60
		Total	21	17		

Part-IV : Value Education is a compulsory paper common for all UG courses. Students have to write examination in first semester.

Part-V : Environmental Studies is a compulsory paper common for all UG courses. Students have to write examination in second semester.

See Appendix – PCA2

Scheme of Examination / Question Paper Pattern I - Theory Subjects:
(Total Marks: 100 (Internal: 25 Marks, External: 75 Marks)

Parameters			
Internal Marks		**External Marks**	
i. Average of two tests	10 Marks	i. Part – A (10*1)	10 Marks
ii. Assignment	05 Marks	ii. Part – B (5*7)	35 Marks
iii. Seminar/ Group Discussion	05 Marks	iii. Part – C (3*10)	30 Marks
iv. Peer-team-Teaching	05 Marks		
Total :	25 Marks	Total :	75 Marks

Note: Peer-Team-Teaching shall conducted by forming a groups according the strength of the class with representation of both slow learners and fast learners. At least 10 % of the syllabus may be allocated with proportional allocation of teaching hours and be evaluated.

External examination question pattern:

Time: 3 Hours	**Max. Marks: 75**

Part – A
(10*1=10)

 Answer all the questions

Ten Questions, two questions from every unit: Multiple Choice questions.

Part – B
(5*7=35)
Answer all the questions

Five Questions, one question set from every unit: Either …Or… type

Part – C
(3*10=30)
Answer any three questions

Five Questions, one question from every unit

II - Practical Subjects:
(Total Marks: 100 (Internal: 40 marks, External: 60 Marks)

- A candidate has to prepare Algorithm / Procedure for both the questions covering both the parts.
- The following list of parameters taken into account for the evaluation of practical examination.

Parameters			
Internal Marks		**External Marks**	
i. Average of two tests 25 Marks		i. Aim, Procedure / Algorithm and Program 15 Marks	
ii. Record Work 10 Marks		ii. Coding and Compilation 10 Marks	
iii. Seminar/ Quiz / Viva 05 Marks		iii. Debugging 15 Marks	
		iv. Results 10 Marks	
		v. Viva-Voce 10 Marks	
Total : 40 Marks		Total : 60 Marks	

Note : The External Examiner can fix exercises also other than those found in the list (Syllabus) in consultation with the Internal Examiner without violating the scope of the prescribed syllabus.

III - Project Work: (Total Marks: 100 (Internal: 25 marks, External: 75 Marks))

The following list of parameters taken into account for the evaluation of the Project work.

Parameters			
Internal Marks		**External Marks**	
Review 1: 7.5Marks		i. Project Report: 25 Marks	
Review 2: 7.5Marks		ii. Project demo & Presentation : 30 Marks	
Overall Performance: 10 Marks		iii. Viva-Voce : 20 Marks	
Total : 25 Marks		Total : 75 Marks	

The combined project shall be undertaken by the students as a team of two.

Appendix PCA3
CS 1: Fundamentals of Computer and C Programming
(4 Hours – 4 Credits)

Unit-I : Overview of C: History of C – Importance of C – Basic Structure of C Programs – Programming Style – Character Set – C Tokens – Keywords and Identifiers – Constants, Variables and Data Types – Declaration of Variables – Defining Symbolic Constants – Declaring a variable as a constant – overflow and underflow of data – Operators and Expressions: Arithmetic, relational, logical, assignment operators – increment and decrement operators, conditional operators, bitwise operators, special operators – Arithmetic Expressions- Evaluation of Expressions – Precedence of Arithmetic Operators – Type Conversions in Expressions – Operator Precedence and Associativity.

Unit-II : Managing I/O Operations: Reading and Writing a Character – Formatted Input, Output – Decision Making & Branching: if statement - if else statement - nesting of if else statements - else if ladder – switch statement – the ?: operator – go to statement – the while statement – do statement – the for statement – jumps in loops.

Unit-III : Arrays: One-Dimensional Arrays – Declaration, Initialization – Two-Dimensional Arrays – Multi-dimensional Arrays – Dynamic Arrays – Initialization. Strings: Declaration, Initialization of string variables – reading and writing strings – string handling functions.

Unit-IV :User-defined functions: need – multi-function programs – elements of user defined functions – definition – return values and their types – function calls, declaration, category – all types of arguments and return values – nesting of functions – recursion – passing arrays, strings to functions – scope visibility and life time of variables. Structures and Unions: Defining a structure – declaring a structure variable – accessing structure members – initialization – copying and comparing – operation on individual members – array of structures – arrays within structures – structures within structures – structures and functions – unions – size of structures – bit fields.

Unit-V : Pointers: Accessing the address of a variable – declaring, initialization of pointer variables – accessing a variable through its pointer – chain of pointers – pointer increments and scale factors – pointers and character strings – pointers as function arguments – pointers and structures. Files: Defining, opening, closing a file – IO Operations on files – Error handling during IO operations – command line arguments.

Text Book : Programming in ANSI C, E. Balagurusamy, 7th Edition, Mc Graw Hill Education (India) Pvt. Ltd., 2017.

> Unit I: Chapter 1, Chapter 2, Chapter 3
> Unit II: Chapters 4, Chapter 5, Chapter 6
> Unit III: Chapter 7, Chapter 8
> Unit IV: Chapter 9, Chapter 10
> Unit V: Chapter 11, Chapter 12

Reference Books:
1. B. Gottfried, "Schaum's Outline of Programming with C", 3rd Edition, Tata Mc Graw Hill, 2010.
2. J.R. Hanly and E.B. Koffman, "Problem Solving and Program Design in C", 6th Edition, Pearson Education, 2009.

3. Programming with ANSI and Turbo C, Ashok N.Kamthane , Pearson Education, 2006

4. H. Schildt, C: The Complete Reference, 4th Edition, TMH Edition, 2000.

5. Kanetkar Y., Let us C, BPB Pub., New Delhi, 1999.

CS 2: Lab 1: Programming in C
(6 Hours – 4 Credits)

Section A
1. Write a program in C to find the maximum and minimum element in an array. (user input)
2. Write a program in C to print all unique elements in an array. (user input).

3. Write a Program in C to Check Whether a string is Palindrome or Not (without using default string functions).

4. Write a program in C to menu driven program for string manipulation using switch case.

5. Write a program in C to Sum of digit.
6. Write a program in C to check a given number Armstrong or not.

7. Write a program in C to print Pascal triangle upto n rows.
    Sample Input: 5

    Sample Output: 1
          1 1
          1 2 1
          1 3 3 1
          1 4 6 4 1
8. Write a program in C to convert decimal number to binary number using the function
9. Write a program in C to search an element using linear search technique.
10. Write a program in C to add two Matrices and display matrix format with result
11. Write a program in C to print Fibonacci Series using recursion.
12. Write a program in C to implementation of Digital Clock
13. Write a program in C to count the number of vowels and consonants in a string using a pointer.
14. Write a program in C to create and store information in a text file
15. Write a program in C to extract individual bytes from an unsigned int using union

Section B
1. Write a program in C for multiplication of two matrices (User input: row, column, Matrix A, Matrix B).
2. Write a program in C to Finding the No. of characters, words and lines from a given text file.
3. Write a program in C to copy a file in another name.
4. Write a program in C to Binary Search.
5. Write a program in C to read and write information of an employee using structure.
6. Write a Program in C to design Log In screen, check username and password using structure.

AS 1: Discrete Mathematics
(4 Hours – 4 Credits)

Unit-I : Set Theory: Introduction – Sets – Notation and Description of Sets – Subsets – Venn – Euler Diagrams – Operation on sets – Properties of set operations – Verification of basic laws and algebra by Venn Diagram.

Unit-II : Relations and Functions: Relations – Representation of a relation – Operations on relations – equivalence relation – Closures & Warshalls Algorithm – Partial order Relation – Hasse Diagrams – Lattices.

Unit-III : Logic: Introduction – IF statements – Connectives – Truth table of a formula – Tautology – Tautological implications and Equivalence of formulae – Quantifiers.

Unit-IV : Recurrence relations and Generating functions: Recurrence relation – an introduction – Polynomial and their evaluations – Recurrence relations – Solutions of finite order homogeneous (linear) relations – Solutions of non-homogeneous relations – Generating functions (for all the theorem consider the statements without proofs).

Unit-V : Graph Theory: Basic concepts – Matrix representations of graphs – Trees – Spanning tree – shortest path problem.

Text Book : Discrete Mathematics – M.Venkataraman, N.Sridharan and N.Chandrasekaran – The National Publishing Company, May 2009.

UNIT I : Chapter 1.1 to 1.8
UNIT II: Chapter 2 (2.2 to 2.6), 10.1
UNIT III: Chapter 9 (9.1 to 9.3, 9.6 to 9.8, 9.15)
UNIT IV: Chapter 5.1 to 5.6
UNIT V: Chapter 11.1 to 11.5

CS 3: Object Oriented Programming with C++
(4 Hours – 4 Credits)

Objectives: To inculcate knowledge in object oriented programming concepts - To enrich the knowledge in inheritance and virtual functions.

Unit-I : Software Crisis – Software Evolution – Basic Concepts of Object-Oriented Programming – Benefits of OOP – Object-Oriented Languages - Applications of OOP – Application of C++ - Structure of a C++ Program – Tokens – Keywords – Identifiers – Basic Data Types – User-defined Data types – Derived data types – Symbolic constants – Type compatibility – Declaration of variables – Dynamic initialization of variables – Reference variables – Operators in C++ - Manipulators – Type cast operator – Expressions and their types-Implicit conversions – Control structures – The main function – Function prototyping – inline functions – Function overloading.

Unit-II : Specifying a class – Defining member functions – Making an outside function inline – Nesting of member functions – Private member functions – Array within a class – Memory allocation for objects – Static data members – Static member functions – Array of objects - Objects as function arguments – Friendly functions – Returning objects – Constant member functions – Constructors – Parameterized constructor – Multiple constructors in a class – Constructors with default arguments – Dynamic initialization of objects – Copy constructor – Destructors.

Unit-III : Defining operator overloading – Overloading unary operators – Overloading binary operators – Overloading binary operators using friend function – Rules for overloading operators - Defining derived classes – Single inheritance – Making a private member inheritable – Multilevel inheritance – Multiple inheritance – Hierarchical inheritance – Hybrid inheritance - Virtual base classes – Constructors in derived class – Member classes: Nesting of classes.

Unit-IV : Pointer to objects – this pointer – Pointers to derived classes – Virtual functions – Pure virtual functions – C++ Stream classes – Unformatted I/O operations – Managing output with manipulators.

Unit-V : Classes of file stream operations – Opening and Closing files – Detecting end of file – More about open() function – File modes, File pointers and their manipulation – Sequential input and output operations – Command-line arguments- Templates: class templates and function templates.

Text Book : Object Oriented Programming with C++**,** E. Balagurusamy, McGraw Hill Education (India) Private Limited, New Delhi, *Sixth Edition-*2013

> Unit I : Chapter 1 (Except 1.3, 1.4), Chapter 2 (Only 2.6), Chapter 3 (Except 3.20, 3.21, 3.22) and Chapter 4
>
> Unit II : Chapter 5 (Except 5.18, 5.19), Chapter 6 (Except 6.8, 6.9, 6.10)
> Unit III: Chapter 7 and Chapter 8
> Unit IV: Chapter 9 and Chapter 10
> Unit V: Chapter 11 (Except 11.8) and Chapter 12 (Only 12.2, 12.3 and 12.4)

Reference Books :
1. C++ - The Complete Reference, Herbert Schildt, TMH, 1998.
2. C++ How to Program, Paul Deitel, Harvey Deitel, PHI, Ninth edition (2014).
3. Ashok N. Kamthane, Object Oriented Programming with ANSI & Turbo C ++, Pearson Education, 2006.
4. Object-Oriented Programming Using C++, Alok Kumar Jagadev, Amiya Kumar Rath and Satchidananda Dehuri, Prentice-Hall of India Private Limited, New Delhi, 2007.

CS 4: Lab 2: Problem Solving using C++
(6 Hours – 4 Credits)

Section- A
1. Generate prime numbers between the given two numbers.
2. Perform arithmetic operations using Inline function.
3. Accept a three digit number and display it in words.*(*Example 123 should be printed out as One Two Three)
4. Find the sum of given numbers using function with default arguments.
5. Swap two values using methods of passing arguments in function
6. Prepare a student Record using class and object.
7. Find the area of geometric shapes using function overloading.
8. Illustrate the concept of Friend function.
9. Demonstrate default constructor or no argument constructor.
10. Demonstrate parameterized constructor.
11. Demonstrate copy constructor.
12. Demonstrate constructor overloading.
13. Demonstrate destructors.
14. Demonstrate constructor using „this" pointer.

Section- B

1. Demonstrate constructor with default arguments.
2. Program using manipulators.
3. Perform operator overloading for Unary minus, unary increment and unary decrement
4. Concatenate two strings using the concept of Binary operator overloading.
5. Perform addition and subtraction of complex numbers using Binary Overloading.
6. Create student mark sheet using single inheritance.
7. Prepare employee information using multiple inheritance.
8. Process employee details using hierarchical inheritance.
9. Implement the concept of Virtual functions.
10. Implement the concept of virtual base class.
11. Sort the given set of numbers using function templates
12. Search the key element in the given set of numbers using class template.
13. Processing mark list using binary file.
14. Count number of objects in a file.
15. Demonstrating the use of Command-line arguments.
16. Implement a file handling concept using sequential access.
17. Implement file handling concept using random access

CS 5: Digital Principles and Computer organization
(4 Hours – 4 Credits)

Unit-I : Number Systems and Codes: Binary Number system – Binary to decimal –decimal to binary – hexa decimal – ASCII code – Excess-3 Code – Gray code. Digital Logic: The Basic Gates – NOT, OR, AND - Universal Logic Gates – NOR, NAND.

Unit-II : Combinatorial Logic Circuits: Boolean Laws and Theorems. - Sum of Products method - Truth table to Karnaugh Map – Pairs, Quads, Octets – Don‟ t Care Conditions- Product-of sums method - Product-of sums Simplifications. Data Processing Circuits: Multiplexers – Demultiplexers-1-of-16 Decoder – BDC-to-decimal Decoders – Seven- segment Decoders – Encoders – Exclusive-OR Gates-Parity Generators and Checkers.

Unit-III : Arithmetic Circuits: Binary Addition- Binary Subtraction – 2‟ S Complement Representation - 2‟ S Complement Arithmetic – Arithmetic Building Blocks.

Unit-IV : Basic Computer organization and Design: Instruction codes - stored program organization - Computer registers and common bus system - Computer instructions - Timing and control - Instruction cycle: Fetch and Decode - Register reference instructions. Micro programmed Control: Control memory organization - Address sequencing, micro instruction format and symbolic microinstructions - symbolic micro-program - binary micro-program.

Unit-V : Central Processing Unit : General register organization - stack organization - instruction formats - addressing modes - Data transfer and manipulation - Program control. CISC and RISC - Parallel processing - Pipeline- general co. Input-output organization: Peripheral devices - I/O interface - Memory organization: Memory hierarchy - Main memory - Auxiliary memory.

Text Books :
1. Digital Principles and Applications – Donald P Leach, Albert Paul Malvino, Goutam Saha, 8th edition McGraw-Hill Education, 3rd reprint 2015.
2. Computer System Architecture, M. Morris Mano, Pearson Education, 3rd edition.
2007 Unit I: 5: (5.1 to 5.9) and 2: (2.1 to 2.3) Text Book 1
Unit II: 3: (3.1 to 3.8) and 4: (4.1 to 4.7) Text Book 1
Unit III: 6: (6.1 to 6.8) Text Book 1
Unit IV: 5 (5.1 to 5.5) and 7 (7.1 to 7.3) Text Book 2
Unit V: 8 (8.1 to 8.8), 9 (9.1 to 9.2), Text Book 2 11 (11.1 to 11.5) and 12 (12.1 to 12.3).

Reference Books:
1.   Digital Design, R.Anantha Natarajan, PHI Learning, 2015.
2.   Principles of digital Electronics, K.Meena, PHI Learning, 2013.
3.   Digital Computer Fundamentals, Thomas C. Bartee TMH 2007.
4.   Digital Circuits and Design, S. Salivahanan and S. Arivazhagan, Vikas Publishers, 2005.
5.   Computer Organization and Architecture, V.Rajaraman and T.Radhakrishnan, PHI learning, 5th Print, 2015.
5.   Computer Organization, Carl Hamacher Zvonko Vranesic Safwat Zaky, Mc Graw Hill Education, 5th Edition, 11th reprint, 2015.
6.   Computer Organization and Architecture, Smruti Ranjan Sarangi, Mc Graw Hill Education.

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CS 6: Java Programming

(4 Hours – 4 Credits)

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Objectives : To inculcate knowledge in Java programming concepts - To provide knowledge in Package and Applet concepts - To enrich the knowledge in Multithread and Graphics concepts.

Unit-I : Java Evolution: **Overview of Java Language :** Simple Java Program – Java Program Structure – Command Line Arguments. Constants – Variables – Data types – Declaration of Variables – Scope of Variables – Symbolic Constants – Type Casting. **Operators and Expressions**: Arithmetic Operators – Relational Operators – Logical Operators – Assignment Operators – Increment and Decrement Operators – Conditional Operators – Bitwise Operators – Special Operators – Arithmetic Expressions – Evaluation of Expressions – Precedence of Arithmetic Operators – Operator Precedence and Associativity – Mathematical Functions.

Unit-II : Decision Making and Branching : Decision Making with If statement – Simple If Statement – If else Statement – Nesting If Else Statement – the Else If Ladder – The switch Statement – The ?: operator. **Decision Making and Looping:** The while statement – The do statement – The for statement – Jumps in Loops. **Class, Objects and Methods:** Defining a Class – Fields Declaration – Methods Declaration – Creating Objects – Accessing class members – Constructors – Methods Overloading – Static Members – Nesting of Methods – Inheritance – Arrays, **Strings and Vectors :** One – dimensional Arrays – creating an Array – Two dimensional Arrays – Strings – Vectors – Wrapper Classes – Enumerated Types.

Unit-III : Packages: Java API Packages – Using system Packages – Naming Conventions – Creating Packages – Accessing a Package – Using a Package – Adding a Class to a Package – Hiding Classes – Static Import. **Multithreaded Programming:** Creating Threads – Extending the Thread Class – Stopping and Blocking a Thread – Life Cycle of a Thread.–

Unit-IV : Managing Errors and Exceptions: Types of Errors – Exceptions – Syntax of Exception Handling Code – Multiple Catch Statements – Using Finally Statement – Throwing our own Exceptions – Using Exceptions for debugging. **Applet Programming:** How Applets differ from Applications – Preparing to write Applets – Building Applet Code – Applet Life Cycle – Creating an executable Applet – Designing a Web Page – Applet Tag – Adding Applet to HTML file – Running the Applet.

Unit V: Graphics Programming: The Graphics Class – Lines and Rectangles – Circles – Line Graphs. **Managing Input/output Files in Java:** I/O Exceptions – Creation of Files – Reading / Writing Characters – Reading / Writing Bytes – Handling Primitive Data Types – oncatenating and Buffering Files – Random Access Files – Interactive Input and Output.

Text Book:
Programming with Java, E.Balagurusamy, A primer, Tata McGraw Hill, Fourth Edition, 2008.
        Chapters: Unit I : 1, 2, 3, 4, 5, 6, 7.
                       Unit II : 8, 9, 10.
                       Unit III: 11, 12.
                       Unit IV: 13, 14
                       Unit V:15, 16

Reference Books:
1. Object Oriented Programming Through JAVA- P.Radha Krishna, University Press, 2007.
2. Java and Object-Oriented Programming Paradigm, Debasish Jana, Prentice Hall of India Private Limited, New Delhi, 2008. Edition, July 2014 Reprint.
3. The Complete Reference, Java2, Herbert Schildt, Tata McGraw Hill, Fifth Edition, 2002.
4. Introduction to Java Programming ,K. Somasundaram, Jaico Publications, 2013.
5. Core Java - Vol. I – Fundamentals, Cay S. Horstmann, Pearson Education; Tenth edition, 2016.

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CS 7: Lab 3: Java Programming
(4 Hours – 3 Credits)
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Write Programs in Java for the following:

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Section A
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1. To implement a simple temperature conversion program.
2. To perform addition and subtraction of complex numbers using class and objects.
3. To perform volume calculation using method overloading.
4. Using command line arguments, test if the given string is palindrome or not.
5. String manipulation using String Methods (Use of any five String methods are preferred).

6. Write a program to fill names into a list .Also, copy them in reverse order into another list. If the name contains any numeric value throw an exception "Invalid Name"
7. Program to demonstrate the use of any two built-in exceptions in Java.

Section B
1. To perform multiplication of matrices using class and objects.
2. Using multilevel inheritance process student marks.
3. Implement multiple inheritance for payroll processing.
4. Implement interface for area calculation for different shapes.
5. Create a package called "Arithmetic" that contains methods to deal with all arithmetic operators. Also write a program to use the package.
6. Create two threads such that one of the thread generate Fibonacci series and another generate perfect numbers between two given limits.
7. Define an exception called **": Marks Out of bound:"** Exception, that is thrown if the entered marks are greater than 100.
8. Program to demonstrate the use of Wrapper class methods.
9. File Processing using Byte stream.
10. File Processing using Character Stream.
11. Write applets to draw the following Shapes:
    (a). Cone **(b).** Cylinder **(c).** Square inside a Circle **(d).** Circle inside a Square
12. Write an applet Program to design a simple calculator.
13. Write an Applet Program to animate a ball across the Screen.

AS 2: Computer based Financial Accounting
(4 Hours – 4 Credits)

Unit-I : Financial Accounting: Meaning, Nature and scope, Limitations – **Accounting Principles :** Basic Concepts and Conventions – Objectives of accounting – Accounting rules.

Unit-II : Books and records : Recording of business transactions – Types of accounts – Journal – Ledger – Journal Vs Ledger, Subsidiary books – Trial balance.

Unit- III : Final Accounts: Introduction – Trading account – Profit and loss account – Balance sheet. (Simple problems)

Unit- IV : Introduction to Tally: Features of Tally 9 – Company info: Create, Select, Alter and Close or Shut Company – Ledger Creation: Creating, Displaying, Altering and Deleting. F11 – Features and F12 – Configuration.

Unit-V : Voucher Creation: Receipt, Payment, Contra, Journal, Sales, Purchase, Memo, Display, Alter, Delete, Insert, Statement of Reports: Trail balance, Profit and Loss account, Balance sheet.

Text Books Financial Accounts – R.S.N. Pillai and Bagavathi, S.Chand, 2007 Unit I: Pg. Numbers – 1 to 22.
Unit II : Pg. Numbers – 30 – 65
Unit III: Pg. Numbers – 154 to 170

1. Tallly (version 9) – C. NellaiKannan, 2007.
                Unit IV : Pg. Numbers – 5 to 61
                Unit V : Pg. Numbers – 62 to 102

 Reference Books Comdex Tally 9 – Dr. Namrata Agrawal, Dream Tech Publications.
 Tally (Accounting Software) S. Palanivel, Margham Publications, 2010.

CS 8: Operating Systems
(4 Hours – 4 Credits)

Unit-I :   Introduction to Operating Systems: Introduction, What is an Operating systems, Operating system components and goals, Operating systems architecture. Process Concepts: Introduction, Process States, Process Management, Interrupts, Inter-process Communication.

Unit-II :   Asynchronous Concurrent Execution: Introduction, Mutual Exclusion, Implementing Mutual Exclusion Primitives, Software solutions to the Mutual Exclusion Problem, Hardware solution to the Mutual Exclusion Problem, Semaphores. Concurrent Programming: Introduction, Monitors.

Unit- III : Deadlock and Indefinite Postponement: Introduction, Examples of Deadlock, Related Problem Indefinite Postponement, Resource concepts, Four Necessary conditions for Deadlock, Deadlock solution, Deadlock Prevention, Deadlock Avoidance with Dijkstra″ s Banker″ s algorithm, Deadlock Detection, Deadlock Recovery. Processor Scheduling: Introduction, Scheduling levels, Preemptive Vs Non-Preemptive Scheduling Priorities, Scheduling objective, Scheduling criteria, Scheduling algorithms.

Unit-IV : Real Memory Organization and Management: Introduction, Memory organization, Memory Management, Memory Hierarchy, Memory Management Strategies, Contiguous Vs Non-Contiguous Memory allocation, Fixed Partition Multi-programmimg, Variable Partition multiprogramming. Virtual Memory Management: Introduction, Page Replacement, Page Replacement Strategies, Page Fault Frequency (PFF) Page replacement, Page Release, Page Size.

Unit-V : Disk Performance Optimization: Introduction, Why Disk Scheduling is necessary, Disk Scheduling strategies, Rotational optimization. File and Database Systems: Introduction, Data Hierarchy, Files, File Systems, File Organization, File Allocation, Free Space Management, File Access control.

Text Book : Operating Systems, Deitel & Deitel Choffnes, Pearson education,
Third edition, 2008.
Unit I: Chapters 1.1, 1.2, 1.12, 1.13 & 3.1 to 3.5
Unit II: Chapters 5.1, 5.2, 5.3, 5.4(up to 5.4.2), 5.5, 5.6 & 6.1, 6.2
Unit III: Chapters 7.1 to 7.10 & 8.1 to 8.7
Unit IV: Chapters 9.1 to 9 6, 9.8, 9.9 & 11.1, 11.5, 11.6, 11.8, 11.9, 11.10
Unit V: Chapters 12.1, 12.4 to 12.6 & 13.1 to 13.8.

Reference Books :
1.An introduction to Operating systems concepts and Practice, Pramod Chandra P. Bhatt, PHI, Second Edition, 2008.
2.Operating System Concepts, Abraham Silberschatz Peter Galvin Greg Gagne, 6th edition Windows XP Update, Wiley India edition, 2007.
3.Operating Systems Principles and Design, Pal Choudhury, PHI Learning, 2011.
4.Operating Systems, A Concept Based Approach DhananjayM.Dhamdhere Tata McGraw Hill, 3rd Edition, 2012.

CS 9: Data Structures and Computer Algorithms
(4 Hours – 4 Credits)

Objective : Learning concept of data structures, including its representation and operations performed on them, which are then linked to sorting, searching and indexing which are performed on them, to increase the knowledge of usage of data structures in algorithmic perspective.

Unit-I : Introduction, Basic Terminology, Elementary date, organization, data structure, Date structure operations, Algorithmic Notation, Control structures, complexity of algorithms, variables, data types.

Unit-II : Arrays: Introduction, Linear arrays, representation of linear arrays in memory, Traversing Linear arrays, Inserting & Deleting, Sorting: Bubble sort, searching: Linear search, Binary search, multidimensional arrays, Pointers, records.

Unit-III : Linked Lists: Introduction, Linked List, representation of Linked list in memory, traversing a linked list, Searching a linked list, Memory allocation, Garbage collection, Insertion into a linked list, Deletion from a linked list.

Unit-IV : Stacks: Introduction, Stacks, array representation of stacks, Linked representation of stacks, Quick sort. Recursion: Tower of Hanoi, Queues: Linked representation of Queues, Deques.

Unit –V : TREES: Introduction, Binary Trees, Representing Binary Trees in Memory, Traversing Binary Trees, Traversal Algorithms using Stacks, Binary Search Trees, Searching and Inserting in Binary Search Trees, Deleting in a Binary Search Tree. Graph: introduction, graph theory terminology, operation on graph.

Text book : "Data structures", Seymour Lipschutz, Tata Mc-Graw Hill, 2006 UNIT 1: 1.1, 1.2, 1.3, 1.4 , 2.3, 2.4, 2.5, 2.8.

UNIT 2: 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10, 4.11.
UNIT 3: 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8.
UNIT 4: 6.1, 6.2, 6.3, 6.4, 6.6, 6.7, 6.8, 6.10, 6.11, 6.12.
UNIT 5: 7.1, 7.2, 7.3, 7.4, 7.5, 7.7, 7.8, 7.9, 8.1, 8.2, 8.6.

Reference books:
1. Data structure using C++, VARSHA H. PATIL, Publisher: Oxford Higher Education/Oxford University Press, First edition, 2012.
2. Fundamentals of Data structures In C++, Ellis Horowitz, SartajSahni, Dinesh Mehta, University press, 2007.
3. Data Structures using C, Tanaenbaum A.S. Langram Y. Augestein M.J, Pearson Education , 2004.
4. Introduction to the Design and Analysis of Algorithms, Anany Levitin, Pearson Education 2003.

CS10: Lab 4: Data Structures and Computer Algorithms
(4 Hours – 4 Credits)

SECTION - A
1. Implementing Stack as an array.
2. Implementing Stack as a linked list.
3. Convert Infix expression to Postfix expression using stack.
4. Convert Infix expression to Prefix expression using Stack.
5. Implementing Queue as an Array.
6. Implement Queue as a linked list.
7. Binary tree traversals.
8. Implement Binary Search Tree.

SECTION - B
1. Linear Search
2. Binary Search
3. Bubble Sort Algorithm.
4. Insertion Sort Algorithm.
5. Merge Sort Algorithm.
6. Quick Sort Algorithm.
7. Selection Sort Algorithm.

CS 11: Database Management Systems
(4 Hours – 4 Credits)

Unit-I : OVERVIEW OF DATABASE SYSTEMS: Managing Data – A Historical Perspective – File Systems Versus a DBMS – Advantages of a DBMS – Describing and Storing Data in a DBMS – Queries in a DBMS – Transaction Management – Structure of a DBMS – People Who Work with Databases. INTRODUCTION TO DATABASE DESIGN: Database Design and ER Diagrams – Entities, Attributes, and Entity Sets – Relationships and Relationship Sets – Additional Features of ER Model – Conceptual Design With the ER Model.

Unit-II : THE RELATIONAL MODEL: Introduction to the Relational Model – Integrity Constraints over Relations – Enforcing Integrity Constraints – Querying Relational Data – Logical Database Design: ER to Relational – Introduction to Views – Destroying / Altering Tables and Views. RELATIONAL ALGEBRA   AND   CALCULUS : Preliminaries–
Relational Algebra: Selection and Projection – Set Operations –Renaming – Joins - Division
Relational Calculus: Tuple Relational Calculus – Domain Relational Calculus

Unit-III : SQL:QUERIES, CONSTRAINTS, TRIGGERS: The Form of a Basic SQL Query - UNION, INTERSECT, and EXCEPT – Nested Queries – Aggregate Operators – Null Values – Complex Integrity Constraints in SQL – Triggers and Active Databases – Designing Active Databases

Unit-IV : FUNCTIONAL DEPENDENCIES AND NORMAL FORMS: Functional Dependencies – Normal Forms – Normalization – First normal form(1NF) – Second normal form (2NF) – Third normal form(3NF) – Boyce & Codd normal form (BCNF) – Other Kinds of Dependencies

Unit-V : OVERVIEW OF TRANSACTION MANAGEMENT: The ACID Properties – Transactions and Schedules – Lock Based Concurrency Control – Performance of Locking – Transaction Support in SQL – Introduction to Crash Recovery. SECURITY AND AUTHORIZATION: Introduction to Database Security - Access Control – Discretionary Access Control – Mandatory Access Control – Security for Internet Applications – Additional Issues Related to Security.

Text Book: Database Management Systems – Raghu Ramakrishnan & Johannes Gehrke, McGraw Hill International Edition – Third Edition – 2003

    UNIT – I   : 1.1 – 1.9 , 2.1 – 2.5
    UNIT – II   : 3.1 – 3.7, 4.1 – 4.3
    UNIT – III   : 5.2 – 5.9
    UNIT – IV   : 19.1 – 19.8
    UNIT – V   : 16.1 – 16.7, 21.1 – 21.6

Reference Books:
1. Database Management Systems - Alexis leon & mathews Leon, "Leon Vikas Publishing, Chennai, 2002.

2. Modern Database Management - Frad R. McFadden, Jeffrey A. Hoffer& Mary. B. Prescott, 5th Edition, Pearson Education Asia, 2001.

3. Database System Concepts – Abraham Silberschatz, Henry F. Korth, S.Sudarshan, McGraw Hill, 2006

CS 12: Software Engineering
(4 Hours – 4 Credits)

Objectives : To acquaint students with the basic concepts and major issues of software engineering - To impart knowledge on the basic principles of software development life cycle - To know the benefits of software analysis, design, testing and documentation efforts.

Unit-I : Introduction to Software Engineering: Some Definitions – Some Size factors – Quality and Productivity Factors – Managerial Issues. Planning a Software Project: Defining the Problem – Developing a Solution Strategy – Planning the Development Process – Planning an Organizational Structure – Other Planning Activities.

Unit-II : Software Cost Estimation: Software Cost Factors – Software Cost Estimation Techniques – Staffing-Level Estimation – Estimating Software Maintenance Costs.

Unit-III : Software Requirements Definitions: The Software Requirements Specification – Formal Specification Techniques – Languages and Processors for Requirements Specification.

Unit-IV : Software Design: Fundamental Design Concepts – Modules and Modularization Criteria – Design Notations – Design Techniques – Detailed Design Considerations – Real-Time and Distributed System Design – Test Plans – Milestones, Walkthroughs, and Inspections - Design Guidelines.

Unit-V : Verification and Validation Techniques: Quality Assurance – Static Analysis – Symbolic Execution – Unit Testing and Debugging – System Testing – Formal Verification. Software Maintenance: Enhancing Maintainability During Development – Managerial Aspects of Software Maintenance – Configuration Management – Source-Code Metrics – Other Maintenance Tools and Techniques.

Text book : Software Engineering Concepts, Richard Fairley, Tata Mc Graw Hill Publishing Company Limited, New Delhi, 1997.

Unit – I : Chapters 1.1 – 1.4, 2.1-2.5
Unit – II : Chapter 3.1 - 3.4
Unit – III : Chapter 4.1 – 4.3
Unit – IV : Chapter 5.1 – 5.9
Unit – V : Chapters 8.1, 8.3 – 8.7, 9.1 – 9.5

Reference Books:

1. Software Engineering – K.L. James, Prentice Hall of India Pvt. Ltd., New Delhi, 2009.
2. Fundamentals of Software Engineering – Rajib Mall, Prentice Hall of India Pvt. Ltd., New Delhi, 2003.
3. Software Engineering – Bharat Bhushan Agarwal & Sumit Prakash Tayal, Firewall Media, New Delhi, 2016.
4. Software Engineering, Jawadekar, Tata McGraw-Hill book Company, 2004.
5. Software Engineering a Practitioner's Approach, Roger S Pressman, Tata Mc"Graw-Hill book Company, 6th edition, 2005.

<div align="center">

CS 13: Dot Net Programming
(4 Hours – 4 Credits)

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Objectives : To discriminate between procedural and object-oriented programming languages.- To identify and use the elements in the Visual Basic .Net environment. - Ability to create simple console and Windows applications using VB .Net - Ability to create Database Applications - To develop the necessary skill to use a very powerful and popular front-end tool, Visual Basic. Net.

Unit- I Introduction: .Net Framework- Components of the .Net framework - Introduction to Visual Basic.Net- Features of VB.Net -VB.Net - Program Structure – VB.Net Integrated

Development Environment- Types of VB.Net ApplicationsVB.Net Basics: Identifiers- Keywords- Data Types- Variables- Constants and Enumerations- Modifiers- Operators – Statements & Directives.

Unit-II : Control Structures: Decision Making Statement - Loops- Loop Control Statements.

Arrays: Arrays- Strings - VB.Net-Collections. Functions & Sub Procedures: Defining a Function – Function Returning a Value – Recursive Function – Param Arrays – Passing Arrays as Function Arguments - Sub Procedures.

Unit-III : Object Oriented Programming Paradigm: Classes & Objects- Interfaces – Delegate – Events - Event Handling - Exception Handling- File Handling.

Unit-IV : .Net Controls: Vb.Net Tool Box- Forms- Textbox- Label- Button- List Box-Combo Box- Radio Button- Check Box- Picture Box – Scroll Bar – Track Bar – Container Controls. Advanced Controls: Progress Bar- Date Time Picker – Tree View – The Tree Node Class – ListView –Image List –Tooltip – Rich Textbox –Timer Control – MDI Form

Unit-V : Dialog Boxes and Menus: Dialog Box- Modal Forms – Menus – Adding Cut, Copy and Paste Functionalities in a Form – Anchoring and Docking Controls in a Form. Database Access: Introduction to ADO.Net – ADO.Net Object Model – Connecting to a SQL Server Database – Crystal Reports

Text Book: VB.NET Seeds, K. Krishnaveni, S. Sasikala, S. Pradeep Kumar Kenny,
KK Publications, 2013.

> **Chapters:**
> Unit I   : 1,2
> Unit II   : 3,4,5
> Unit III   : 6,7
> Unit IV   : 8,9
> Unit V   : 10, 11, 12

Reference Books:
1. Microsoft Visual Basic .NET 2003 Unleashed, Heinrich Gantenbein , SAMs Publications, First Edition, 2004.
2. Programming VB.NET, A Guide For Experienced Programmers, Gary Cornell & Jonathan Morrison, A press, 2002.
3. Visual Basic .NET Programming Black Book, Steven Holzner, Dream Tech Press, 2010.
4. Programming Visual Basic .NET Dave Grundgeiger Publisher: O'Reilly First Edition January 2002.
5. Visual Basic .NET The Complete Reference Jeffrey R. Shapiro, The McGraw−Hill Companies,2002.

CS 14: Lab 5: Dot Net Programming (VB.Net)
(6 Hours – 4 Credits)

SECTION A -   Console Applications
1. To perform Number Checking (Sum of Digits, Factorial, Armstrong)
2. To prepare a Student Mark Sheet using Struct & Enum.
3. To perform String Manipulation.
4. To Handle Built – in Exceptions.
5. To Handle User Defined Exceptions.
6. To prepare Pay Bill for Employees using Functions.
7. To prepare EB Bill using Constructor.
8. To perform Sorting on Numbers using an Array.
9. To calculate the area of different shapes using function overloading.

SECTION B - Windows Applications

10. To perform Number Checking (Sum of Digits, Factorial, Armstrong)
11. To prepare a Student Mark Sheet using Struct & Enum.
12. To perform String Manipulation.
13. To Handle Built – in Exceptions.
14. To Handle User Defined Exceptions.
15. To prepare Pay Bill for Employees using Functions.
16. To prepare EB Bill using Constructor.
17. To Design an Application Form using Win Form Controls.
18. To Design Login Form using Read – Write only Properties.
19. To prepare student mark statement using Database.

CS 15: Computer Networks
(5 Hours – 4 Credits)

Unit- I : Introduction: Uses of Computer Networks - Network Hardware – LAN, MAN and WAN- Network Software - Reference Models- Example Networks.

Unit-II : Physical Layer: The Theoretical Basis For Data Communication **-** Guided Transmission media - Wireless Transmission - Communication Satellites- Public Switched Telephone Network- The Mobile Telephone System.

Unit- III : Data Link Layer: Data Link Layer Design Issues - Error Detection and Correction – Elementary data link protocols - Sliding Window Protocols – Example Data Link Protocols.

Unit –IV : Network Layer: Network Layer Design Issues- Routing Algorithms-Congestion Control Algorithms- Quality of Service – Internet working. **Transport Layer:** Transport Services – Elements of transport protocols – Performance issues.

Unit- V : Application layers: Domain name system – Electric mail – The World Wide Web. **Network security:** Cryptography- Symmetric-Key algorithms- Public-Key algorithms – Digital signature.

Text Book:
Computer Networks‖ Andrew S.Tanenbaum , David J. Wetherall, Fifth Edition,
Pearson Education , 2011.

CS 16: Web Programming
(5 Hours – 4 Credits)

Unit-I : INTRODUCTION: Internet Principles – Basic Web Concepts – Client/Server model
– retrieving data from Internet – HTM and Scripting Languages – Standard Generalized Mark
–up languages – Next Generation – Internet –Protocols and Applications.

Unit- II : COMMON GATEWAY INTERFACE PROGRAMMING: HTML forms – CGI
Concepts – HTML tags Emulation – Server – Browser Communication – E-mail generation
– CGI client Side applets – CGI server applets– authorization and security.

Unit-III : SCRIPTING LANGUAGES: Dynamic HTML-Cascading style sheets-Object model
and Event model- Filters and Transitions-Active X Controls-Multimedia-Client side script - VB
Script programming – Forms – Scripting Object.

Unit –IV : SERVER SIDE PROGRAMMING: XML – Server side includes – communication
– DTD – Vocabularies – DOM methods – Firewalls– Proxy Servers.

Unit –V : SERVELETS AND JSP: JSP Technology Introduction-JSP and Serve lets- Running
JSP Applications BasicJSP- JavaBeans Classes and JSP-Tag Libraries and Files- Support for
the ModelView-Controller Paradigm- Case Study- Related Technologies.

Text Books:
1. Deitel H.M. and Deitel P.J., "Internet and World Wide Web How to program", Pearson
   International, 2012, 4th Edition. (Ch-1, 4, 5, 6, 12, 14, 26, 27)
2. Gopalan N.P. and Akilandeswari. J, "Web Technology", PHI,2011. (Ch-1 to 11)
3. Paul Dietel and Harvey Deitel,"Java How to Program", PHI,8th Edition. (Ch-29)

Reference Books:
1. Mahesh P. Matha, "Core Java A Comprehensive study", Prentice Hall of India, 2011.
2. Uttam K. Roy, "Web Technologies", Oxford University Press, 2011.

CS 17: Lab 06: Web Programming
(6 Hours – 4 Credits)

1. Write programs in Java to demonstrate the use of following components:
    i. Text fields, buttons, Scrollbar, Choice, List and Check box.
2. Write Java programs to demonstrate the use of various Layouts like Flow Layout,
    i. Border Layout, Grid Layout and card layout.
3. Write programs in Java to create applets incorporating the following features:
    i. Create a color palette with matrix of buttons

ii. Set background and foreground of the control text area by selecting a color from color palette.

iii. In order to select Foreground or background use check box controlas radio buttons

4. Write programs in Java to do the following.

    i. Set the URL of another server.

    ii. Download the homepage of the server.

    iii. Display the contents of homepage with date, content type, and Expiration date. Last modified and length of the home page.

5. Write programs in Java using sockets to implement the following:

    i. HTTP request

    ii. FTP

    iii. SMTP

    iv. POP3

6. Write a program in Java for creating simple chat application with datagram sockets and datagram packets.

7. Write programs in Java using Servlets:

    i. To invoke servlets from HTML forms

    ii. To invoke servlets from Applets

8. Write programs in Java to create three-tier applications using serve lets for conducting on-line examination for displaying student mark list. Assume that student information is available in a database which has been stored in a database server.

9. Create a web page with the following using HTML

    i. To embed a map in a web page

    ii. To fix the hot spots in that map

    iii. Show all the related information when the hot spots are clicked.

10. Create a web page with the following.

    i. Cascading style sheets.

    ii. Embedded style sheets.

    iii. Inline style sheets. Use our college information for the web pages.

Project Work/ Viva-Voce --ES1

II - Project Work:

(Total Marks: 100 (Internal: 25 marks, External: 75 Marks))

The following list of parameters taken into account for the evaluation of the Project work. The combined project shall be undertaken by the students as a team of two.

Parameters	
Internal Marks	**External Marks**
Review 1:7.5Marks	i.Project Report : 25 Marks
Review 2:7.5Marks	ii.Project demo & Presentation : 30 Marks
Overall Performance: 10 Marks	iii.Viva-Voce : 20 Marks
Total 25 Marks	**Total : 75Marks**

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