## ALAGAPPA UNIVERSITY, KARAIKUDI

**NEW SYLLABUS UNDER CBCS PATTERN (w.e.f.2017-18)**

## B.Sc. SOFTWARE – PROGRAMME STRUCTURE

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sem.** | **Part** | **Course Code** | **Title of the Course** | **Cr.** | **Hrs./**  **Week** | **Max. Marks** | | |
| **Int.** | **Ext.** | **Total** |
| I | I | 711T | **Tamil / other languages – I** | 3 | 6 | 25 | 75 | 100 |
| II | 712E | **English – I** | 3 | 6 | 25 | 75 | 100 |
| III | 7BSO1C1 | **Core – I** – C & Data Structures | 4 | 6 | 25 | 75 | 100 |
| 7BSO1P1 | **Core–II**–C&Data Structures Lab | 4 | 6 | **40** | **60** | 100 |
|  | **Allied – I** (Theory only) **(or)**  **Allied – I** (Theory cum Practical) | 5  4 | 5  3 | 25  15 | 75  60 | 100  75 |
| **Allied Practical – I** | - | 2\*\* | -- | -- | --- |
| IV | 7NME1A /  7NME1B /  7NME1C | **(1) Non-Major Elective – I** – (**A**)jkpo;nkhopapd;mbg;gilfs;/ (**B**) ,f;fhy ,yf;fpak; /  (**C**) Communicative English | 2 | 1 | 25 | 75 | 100 |
|  | **Total (Allied Theory only)** | | | **21** | **30** | **--** | **--** | **600** |
| **Total (Allied Theory cum Practical)** | | | **20** | **575** |
| II | I | 721T | **Tamil/other languages – II** | 3 | 6 | 25 | 75 | 100 |
| II | 722E | **English – II** | 3 | 6 | 25 | 75 | 100 |
| III | 7BSO2C1 | **Core–III –** Programming in C++ | 4 | 6 | 25 | 75 | 100 |
| 7BSO2P1 | **Core–IV–**Programming in C++ Lab | 4 | 5 | **40** | **60** | 100 |
|  | **Allied – II** (Theory only) **(or)** **Allied– II**(Theory cum Practical) | 5  4 | 5  3 | 25  15 | 75  60 | 100  75 |
| **Allied Practical – I** | 2 | 2 | 20 | 30 | 50 |
| IV | 7BES2 | **(3) Environmental Studies** | 2 | 2 | 25 | 75 | 100 |
|  | **Total (Allied Theory only)** | | | **21** | **30** | **--** | **--** | **600** |
| **Total (Allied Theory cum Practical)** | | | **22** | **625** |
| III | I | 731T | **Tamil/other languages – III** | 3 | 6 | 25 | 75 | 100 |
| II | 732E | **English – III** | 3 | 6 | 25 | 75 | 100 |
| III | 7BSO3C1 | **Core – V** – Java Programming | 4 | 5 | 25 | 75 | 100 |
| 7BSO3P1 | **Core–VI**–Java Programming Lab | 4 | 5 | **40** | **60** | 100 |
|  | **Allied– III** (Theory only) **(or)**  **Allied–III**(Theory cum Practical) | 5  4 | 5  3 | 25  15 | 75  60 | 100  75 |
| **Allied Practical – I** | - | 2\*\* | -- | -- | --- |
| IV | 7NME3A /  7NME3B /  7NME3C | **(1) Non-major Elective – II- (A)** ,yf;fpaKk; nkhopg;gad;ghLk; /**(B)** goe;jkpo; ,yf;fpaq;fSk; ,yf;fpatuyhWk; / **(C)**Effective Employability Skills | 2 | 1 | 25 | 75 | 100 |
| 7SBS3A1/ 7SBS3A2/  7SBS3A3 | **(2) Skill Based Subjects – I** | 2 | 2 | 25 | 75 | 100 |
| V | 7BEA3 | **Extension activities** | 1 | - | 100 | - | 100 |
|  | **Total (Allied Theory only)** | | | **24** | **30** | **--** | **--** | **800** |
| **Total (Allied Theory cum Practical)** | | | **23** | **775** |
| IV | I | 741T | **Tamil/other languages – IV** | 3 | 6 | 25 | 75 | 100 |
| II | 742E | **English – IV** | 3 | 6 | 25 | 75 | 100 |
| III | 7BSO4C1 | **Core –VII** – Web Design Technology | 4 | 5 | 25 | 75 | 100 |
| 7BSO4P1 | **Core –VIII –** Web Design Lab | 4 | 4 | **40** | **60** | 100 |
|  | **Allied – IV**(Theory only) **(or)** **Allied–IV**(Theory cum Practical) | 5  4 | 5  3 | 25  15 | 75  60 | 100  75 |
|  | **Allied Practical – I** | 2 | 2 | 20 | 30 | 50 |
| IV | 7SBS4B1/ 7SBS4B2/  7SBS4B3 | **(2) Skill Based Subjects – II** | 2 | 2 | 25 | 75 | 100 |
| 7BVE4/ 7BMY4/ 7BWS4 | **(4) Value Education / Manavalakalai Yoga / Women’s Studies** | 2 | 2 | 25 | 75 | 100 |
| **Total (Allied Theory only)** | | | **23** | **30** | **--** | **--** | **700** |
| **Total (Allied Theory cum Practical)** | | | **24** | **725** |
| V | III | 7BSO5C1 | **Core – IX** – Operating System | 4 | 5 | 25 | 75 | 100 |
| 7BSO5C2 | **Core – X** – Data Base Management System | 4 | 5 | 25 | 75 | 100 |
| 7BSO5P1 | **Core – XI** – RDBMS Lab | 4 | 6 | **40** | **60** | 100 |
| 7BSOE1A/  7BSOE1B | **Elective–I**– **A)**Compiler Design **(or)** **B)** Computer Graphics | 5 | 5 | 25 | 75 | 100 |
| 7BSOE2A/  7BSOE2B | **Elective–II**–**A)**Cloud Computing **(or)** **B)** Mobile Technology | 5 | 5 | 25 | 75 | 100 |
| IV | 7SBS5A4/ 7SBS5A5/ 7SBS5A6/  7SBS5A7 | **(2) Skill Based Subjects – I** | 2 | 2 | 25 | 75 | 100 |
| **(2) Skill Based Subjects – I** | 2 | 2 | 25 | 75 | 100 |
| **Total** | | | **26** | **30** | **--** | **--** | **700** |
| VI | III | 7BSO6C1 | **Core – XII –** .Net Programming | 4 | 5 | 25 | 75 | 100 |
| 7BSO6C2 | **Core-XIII-**Software Engineering | 4 | 5 | 25 | 75 | 100 |
| 7BSO6C3 | **Core–XIV**– Computer Networks | 4 | 5 | 25 | 75 | 100 |
| 7BSO6PR | **Core – XV – Project**  **\*Students do the projects in their respective college.** | 4 | 6 | **40** | **60** | 100 |
| 7BSOE3A/  7BSOE3B | **Elective–III–A)** Multimedia **(or)**  **B)** Data Mining and Data Warehousing | 5 | 5 | 25 | 75 | 100 |
| IV | 7SBS6B4/ 7SBS6B5/ 7SBS6B6/  7SBS6B7 | **(2) Skill Based Subjects – II** | 2 | 2 | 25 | 75 | 100 |
| **(2) Skill Based Subjects – II** | 2 | 2 | 25 | 75 | 100 |
| **Total** | | | | **25** | **30** | **--** | **--** | **700** |
| **Grand Total** | | | | **140** | **180** | **--** | **--** | **4100** |

**\*\* University Examinations will be held in the Even Semesters only.**

**B.Sc. SOFTWARE**

**I YEAR – I SEMESTER**

**COURSE CODE: 7BSO1C1**

**CORE COURSE - I – C & DATA STRUCTURES**

**Unit I**

Introduction to Computers : Generation and Classification of Computers -Basic Computer Organization - Number Systems - Computer Codes – Computer Hardware : Input and Output Devices – Memory types – Computer Software – Types of Software – Programming Languages

**Unit II**

Identifiers and keywords – data types – Declarations – Operator and Expressions. Data input, output and control statements – Branching and looping – Nested control structures – Switch. Function: Defining and Accessing a function – Passing Arguments to a function – Recursion– Library function- Macros – C preprocessor – Storage classes.

**Unit III**

Arrays: Defining and processing an array – Passing on array to functions – Multidimensional arrays– arrays and strings. Pointers: Fundamentals – declarations – passing pointers to functions – usage in single dimensional and multi dimensional arrays – Dynamic memory allocation – operations on pointers – arrays of pointers – passing functions to other functions.

**Unit IV**

Defining a structure – Processing a structure – Structures and Pointers – Passing structures to functions – self referential structures – Bit fields – Unions – Enumerations. Data files: opening and closing data file – creating a data file – processing a data file – Unformatted data file – command line parameters.

**Unit V**

Elementary Data Structures: Stack & Queues, Trees – Notion of an Algorithm – Fundamentals of Algorithmic problem solving - Big OH Notation - Sorting – Bubble Sort, Insertion Sort, Selection Sort

**Text Books:**

1. C How to Program , 8th Edition , Paul Deital , Harvey deital, 2016, Pearson
2. Problem Solving & Program Design in C, 8th Edition , Hanly & Hoffman , 2016, Pearson
3. Computer Science :an Over view – 12th Edition-Glean Brook Shear , Dennis Brylow , 2015 , Pearson.

**Books for Reference:**

1. Fundamentals of Computing - G.Muneeswari, R.S.Ponmagal, T.JyothiChitra M.Kumaran, C.Saravanan, Danam Publications , First Edition.
2. Programming in ANSI C, by E. Balagurusamy, Tata McGraw Hill, 4th Edition.
3. Fundamentals of Computers, E. Balagurusamy, TATA McGraw Hill, 2009.

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**I YEAR – I SEMESTER**

**COURSE CODE: 7BSO1P1**

**CORE COURSE - II – C & DATA STRUCTURES LAB**

**Write programs in C to implement the following:**

1. Program using various datatypes .
2. Program branching control statement.
3. Program using switch statement.
4. Program using looping statement.
5. Program using call by value in a function .
6. Program using recursive function.
7. Program using call by reference in a function.
8. Program using preprocessor directives.
9. Program using storage classes.
10. Program using array.
11. Program using string library functions.
12. Program using structure .
13. Program to perform insertion sort.
14. Program to perform bubble sort.
15. Program to perform stack operations .
16. Program to perform queue operations.

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**I YEAR – II SEMESTER**

**COURSE CODE: 7BSO2C1**

**CORE COURSE - III – PROGRAMMING IN C++**

**Unit I**

Principles of object oriented programming – Basic concepts of OOPs - Benefits of OOPs –Structure of C++ - Tokens, Expressions and Control Structures – Functions in c++ – Classes and Objects:- Specifying a Class, Defining Member Functions, A C++ Program with Class

**Unit II**

Inline Function , Private member Functions ,Array within a class, Memory Allocation for Objects, Static Data Members, Static Member Functions, Array of Objects, Objects as Function Arguments, Friend Functions, Returning Objects, Function Overloading, Pointer to Member.

**Unit III**

Constructor and Destructors:-Constructors, Parameterized Constructors, Multiple Constructors in a class, Constructors with Default Arguments – Dynamic Initialization of Objects, Copy Constructor, Dynamic Constructors, Constructing Two-Dimensional Arrays, Destructors.

**Unit IV**

Operator Overloading and Type Conversion – , Defining Operator Overloading –Overloading Unary, Binary Operators – Inheritance:- Defining Derived Class, Single Inheritance, Making Private Member inheritable, Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance- Hybrid Inheritance,

**Unit V**

Virtual Base Class, Abstract Classes, Pointers, Virtual Functions and Polymorphism:- pointers to objects, this pointer, pointer to Derived Classes, Virtual Functions, Pure Virtual Functions.

**Text Books:**

1. C++ How To Program , Deitel & Deitel, 8 th Editon , 2016, Pearson
2. Problem Solving with C++, Savitch , 8th edition, 2012, Pearson

**Books for Reference:**

1. Object-Oriented Programming with C++, E.Balagurusamy, Fourth Edition, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2008.
2. Fundamentals of Algorithms, Ellis Horowitz, Galgotia Publications Pvt Ltd., First Edition, 2005.
3. Clifford A.Schaffer, A Practical introduction to Data structure & Algorithm Analysis, Prentice Hall of India 1997.
4. Alfred V.Aho, John E.Hopcroft and Jeffery D.Ullman, Data Structures & Algorithms, addison Wesley

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**I YEAR – II SEMESTER**

**COURSE CODE: 7BSO2P1**

**CORE COURSE - IV – PROGRAMMING IN C++ LAB**

**Write programs in C++ to implement the following:**

1. Program using class .
2. Program using array with in a class.
3. Program using array of objects.
4. Program using branching control statement.
5. Program using looping control statement.
6. Program using objects as function arguments.
7. Program using friend function.
8. Program using various types of constructors.( Parameterized Default , copy constructor)
9. Program using Function Overloading .
10. Program using operator overloading .
11. Program using single inheritance .
12. Program using multiple inheritance.
13. Program using multilevel inheritance.
14. Program using virtual base class .
15. Program using Virtual Function.

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**II YEAR – III SEMESTER**

**COURSE CODE: 7BSO3C1**

**CORE COURSE - V – JAVA PROGRAMMING**

**Unit I**

Introduction-Java Evolution– Features –Simple Java Program – Comments – Java Program Structure – Tokens – Java Statements – Implementing a Java Program – JVM – Command Line Arguments **-** Constants – Variables – Data Types – Type Casting.

**Unit II**

Operators and Expressions:- Arithmetic Operators – Relational, Logical, Assignment, Increment and Decrement, Conditional, Bitwise, Special Operators – Arithmetic expressions, Evaluation of expression – Precedence of Arithmetic Operators – Type Conversions – Operator Precedence and associativity – Mathematical Functions. Decision Making: Branching and Looping-If ...else, switch – While, do and For loops.

**Unit III**

Classes, Objects and Methods:- Defining a class – Adding variables, methods – Creating objects – Accessing Class Members– Constructors – Methods overloading – static members – Nesting of Methods – Inheritance – Overriding methods – final Variables and methods – Final classes – finalizer methods – Abstract methods and classes – visibility control. Arrays, Strings and Vectors:- Arrays – One Dimensional Arrays – Creating an array – Two Dimensional Arrays – Strings – Vectors – Wrapper Classes. Interfaces:- Multiple Inheritance - Defining interfaces – Extending interfaces – implementing interfaces – Accessing interface variables.

**Unit IV**

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. Multithreaded Programming: Creating Threads – Extending the Thread Class – Stopping and Blocking a Thread – Life Cycle of a Thread – Using Thread methods – Thread Exceptions – Thread Priority – Synchronization – Implementing the ‘Runnable’ Interface. 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.

**Unit V**

Applet Programming: Applets and Application programs Difference - 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 – Passing parameters to Applets – Displaying Numerical values – Getting input from the user. Graphics Programming: The Graphics Class – Lines and Rectangles – Circles and Ellipses – Drawing Arcs – Drawing Polygons – Line Graphs – Using Control Loops in Applets – Drawing Bar Charts.

**Text Books:**

1. Java How to Program, Deitel & Deitel , 9th edition , 2012, Pearson.
2. Introduction to Java programming and Data Structures, Liang, 8 th Edition, 2012, Pearson.

**Books for Reference:**

1. “Programming with JAVA – A Primer”, Fourth Edition 2011”, E. Balagurusamy, TATA McGraw-Hill Publishing Company Limited, New Delhi
2. “Java 2 – The Complete Reference”, Fifth Edition, 2006 Herbert Schildt, TATA Mc Graw Hill Publishing Company Limited, New Delhi.
3. “Java – How to Program”, Sixth Edition 2005, H.M. Deitel, P.J.Deitel, Pearson Education Pvt. Ltd, Delhi.

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**II YEAR – III SEMESTER**

**COURSE CODE: 7BSO3P1**

# CORE COURSE - VI – JAVA PROGRAMMING LAB

**Write programs in JAVA to implement the following:**

1. Program using various data types & operators.
2. Program using branching control statement.
3. Program using looping control statement.
4. Program using class.
5. Program using constructor.
6. Program using arrays .
7. Program using string class .
8. Program using single inheritance .
9. Program using multilevel inheritance.
10. Program using package.
11. Program using Thread .
12. Program to draw circle, ellipse using applet.
13. Program to draw lines, rectangle, polygon using applet.
14. Program using control loops in applet.
15. Program to draw bar chart.

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# II YEAR – IV SEMESTER

**COURSE CODE: 7BSO4C1**

**CORE COURSE - VII – WEB DESIGN TECHNOLOGY**

**Unit I**

Introduction to HTML: Markup Languages – editing HTML – common tags – header – text styling – linking – images – formatting text – special characters, horizontal rules and line breaks – unordered list – nested and ordered list – tables and formatting – forms – linking – frames.

**Unit II**

Java Script: introduction – control structures – if structure – while structure – assignment operators – increment and decrement operators – for structure – switch structure – do/while structure – break and continue statement – logical operators

**Unit III**

Java Script Functions: Programmer defined functions – function definitions – duration of identifiers – scope rules – recursion – recursion vs iteration – global functions. Java Script Arrays:Arrays – declaring and allocating arrays – references and reference parameters – passing arrays to functions – sorting arrays – searching arrays – multiple-subscripted arrays

**Unit IV**

JavaScript Events: Registering event handlers – event onclick and onload – event onmousemove, the event Object and this – on mouseover and on mouseout – onfocus and onblur – form processing with onsubmit and onreset – event bubbling and other events. JavaScript Objects:Math object – String object – Date object –Boolean and Number Object– document object – window object.

**Unit V**

XML:Basics – structuring Data – XML Name Spaces – Document Type Definations – W3C XML schema documents – XML Vocabularies. CSS:- Introduction-Styling a page-Adding to the <STYLE>- Linking Style sheets-Elements of <STYLE>-Style Sheets and positioning-Media Types – Building a Dropdown menu

**Text Books:**

1. “Internet and world wide web– How to program”, H.M.Deitel, P.J.Deital, T.R.Nieto, 4th Edition, 2008, Pearson Education Asia – Addison Wesley Longman Pvt Ltd.
2. ”Dynamic HTML-Master the Essentials”,Joseph Schmuller,BPB Publications,First Edition 1998

**Book for Reference:**

1. “Special edition using HTML”, Mark R Brown and Jerry Honeycutt, Third edition, 1997, Macmillon. Computer Publishing.

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**II YEAR – IV SEMESTER**

**COURSE CODE: 7BSO4P1**

**CORE COURSE - VIII – WEB DESIGN LAB**

**Simple HTML Program**

* Web Page Designing with Heading and Font Tags
* Web Page Designing with <HR> and Marquee Tag

**Hyperlinks**

* Web Page Designing to demonstrate the Link between different Documents.
* Web Page Designing to demonstrate the Link within the same Document
* Web Page designing with anchor tag with different TARGET values.

**Tables**

* Design a Bio-Data with Table
* Web Page Designing to implement the Concepts of Table Tags

**Forms**

* Design a Web Page using Form Attributes.
* Design a Web Page with Form Controls and Table.

**Image Map**

* Create a Web Page using Image Map.

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**III YEAR – V SEMESTER**

**COURSE CODE: 7BSO5C1**

CORE COURSE - IX – OPERATING SYSTEM

**Unit I**

Evolution of Operating system- Types of operating system- Different views of operating system - Processes: the process concepts - The operating system’s view of processes – Operating system services for process management.

**Unit II**

Scheduling – scheduling algorithms - Inter process synchronization: Need for Inter process synchronization – Semaphores - Hardware support for Mutual Exclusion – queuing implementation of semaphores – Classical problems in concurrent programming.

**Unit III**

Inter process communication and synchronization: Critical region and conditional critical region – Monitors – Messages – Issues in Message Implementation – Deadlocks.

Memory management: continuous allocation – single process monitor – Partitioned memory allocation – static.

**Unit IV**

Memory Management: Non contiguous allocation- Paging – Virtual Memory – Allocation policies – page Fault Frequency – Working set: A Theory for page Replacement and Allocation.

**Unit V**

File Management: Command Language user’s View of the File system – Systems programmer’s view of the file system – Disk Organization – Disk controller and Driver – Operating Systems view of the File Management.

Unix Operating System: History – Design Goals – Memory Management – Processor Management – Device Management – File Management – User Interface

**Text Book:**

1. Operating Systems Concepts and Design, Milan Milenkovic, Tata McGraw Hill Edition 2009.

**Books for Reference:**

1. Operating systems Internal and Design Principles – Fifth Edition, William Stallings, PHI, 2005
2. Operating systems – Second edition, Achyut S Godbole, TMH, 2005.

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**III YEAR – V SEMESTER**

**COURSE CODE: 7BSO5C2**

**CORE COURSE - X – DATABASE MANAGEMENT SYSTEM**

**Unit I**

Introduction: Database System Applications – Purpose of Database Systems – View of Data– Database Languages – Relational Databases – Database Design – Object based and semi structured databases – Data storage and Querying – Database Users and Administrators– Transaction Management – Database users and Architectures – History of Database System.

Entity-Relationship Model: E-R model – constraints – E-R diagrams – E-R design issues – weak entity sets – Extended E-R features.

**Unit II**

Relational Database Design:Features of goodRelational designs – Atomic domains and First Normal Form – Decomposition using functional dependencies – Functional dependency theory – Decomposition using functional – Decomposition using multivalued dependencies – more Normal forms – database design process – modeling temporal data

**Unit III**

Database System Architecture: Centralized and Client-Server architecture – Server system architecture – parallel systems – Distributed systems. Schema Objects-Data Integrity:-Types of Integrity-Triggers-Integrity constraints – Creating and Maintaining Tables – Indexes – Sequences – Views – Users Privileges and Roles – Synonyms.

**Unit IV**

PL/SQL: PL/SQL Blocks – Declaration Section-Execution Section-Exception Section-Control Structures-Integrating SQL in a PL/SQL program. Triggers: Components of a Trigger-Type of Triggers-Creating a Trigger-Modifying a Trigger-Enabling/Disabling a Trigger-Deleting a Trigger.

**Unit V**

Stored Procedures and Functions-Package-Cursors-Transaction

**Text Books:**

1. Database System Concepts – Silberschatz Korth Sudarshan, International (5th Edition) McGraw Hill Higher Education 2010
2. Jose A.Ramalho – Learn ORACLE 8i BPB Publications, 2007

**Books for Reference:**

1. “Oracle 9i The complete reference“, Kevin Loney and George Koch, Tata McGraw Hill, 2004.
2. “Database Management Systems“, Ramakrishnan and Gehrke, McGraw Hill, Third Edition, 2003.
3. “Oracle 9i PL/SQL Programming”, Scott Urman, Oracle Press, Tata McGraw Hill, 2002.

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**III YEAR – V SEMESTER**

**COURSE CODE: 7BSO5P1**

**CORE COURSE - XI – RDBMS LAB**

1. Performing DDL, DML operations in a table.

2. Creating and dropping Views/ Synonyms / Sequence.

3. Writing procedures and passing values.

4. Setting predefine Exception

5. Creating User defined Exception

6. Writing Function

7. Creating Package

8. Creating Triggers

9. Splitting a table values and stores them into multiple tables.

10. Simple PL/SQL programs (Non-database problems).

11. Writing program in PL/SQL using aggregate function.

12. Performing Join & Set operations

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**III YEAR – V SEMESTER**

**COURSE CODE: 7BSOE1A**

ELECTIVE COURSE I (A) – COMPILER DESIGN

**Unit I**

**Introduction to Compilers:** Compilers and Translators – Need – Structure of a Compiler **Lexical Analysis :** Role of Lexical Analyzers – Design of lexical analyzer – Finite Automata – Regular expression to finite Automata – Minimizing the number of states of DFA – Language Specification and Implementation of Lexical Analyzer.

**Unit II**

**Syntactic Specification of Programming Languages :** Context free grammars – Derivation and Parse tree capabilities of context free grammars. **Basic Parsing Techniques:** Parsing – Shift reduce parsing – operator precedence parsing – Top down parsing – Predictive parsers – LR parsers.

**Unit III**

**Syntax Directed Translator :** Principle ideas – Intermediate Code Generation – Syntax directed approach and Translation Schemes for simple assignment and simple control structures. **Symbol Tables :** Contents and Scope representation.

**Unit IV**

**Runtime Storage Administration :** Implementation of a simple stack allocation schemes and a block structured language. **Error Detection and Recovery :** Errors – Lexical Phase Errors – Syntactic Phase Errors – Semantic Errors.

**Unit V**

**Code Optimization :** Principal Sources – Loop Optimization – DAG representation of basic blocks – Value numbers and algebraic laws – Global Data Flow analysis. **Code Generation:** Object programs – Problems in Code Generation – A machine model – A Simple Code Generator – Register allocation and assignment.

**Text Book:**

1. Principles of Complier Design by Alfred V Aho and Jeffrey D. Ullman, Narosa publications, 2nd Edition, 2002.

**Books for Reference:**

1. Modern Compiler Implementation in C by Andrew N. Appel, Cambridge University

Press, 2004.

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**III YEAR – V SEMESTER**

**COURSE CODE: 7BSOE1B**

**ELECTIVE COURSE I (B) – COMPUTER GRAPHICS**

**Unit I**

Introduction: Overview – Brief History – Applications of Computer Graphics – Video Display Generation – Input Devices – Hard Copy output Devices – Graphics System Software– Output Primitives: Point Plotting – Line Draw Algorithms – Using Equation of a line – DDA – Bresenham’s algorithm – Circle Generation Algorithms – Drawing Ellipse

**Unit II**

Two Dimensional Transformations: Transformation Principles – Basic Transformations – Matrix Representation – Composite Transformations.

**Unit III**

Two dimensional viewing and Clipping: Viewing Transformations – Windows and viewpoints – Aspect Ratio – Clipping and Shielding: Point Clipping – Line Segment Clipping– Convex polygon clipping – Sutherland Hodgman Algorithm.

**Unit IV**

Three Dimensional Transformations: Concepts – Basic Transformations: Translation, Scaling, Rotation and Mirror Reflection – Matrix Representation – Composite Transformation.

**Unit V**

User Interface design: Components of User interface – The User’s model – The Command Language – Styles of Command Language – Information Display – Feedback – Examples.

**Text Books:**

1. M. Newman and F. Sproull, Interactive Computer Graphics, McGraw Hill
2. Plastok and Gordon Kalley, Computer Graphics, McGraw Hill

**Book for Reference:**

1. Foley Feiner, Computer Graphics, Principles and Practice – Addison Wesley

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**III YEAR – V SEMESTER**

**COURSE CODE: 7BSOE2A**

**ELECTIVE COURSE II (A) – CLOUD COMPUTING**

**Unit I**

**Systems Modeling, Clustering and Virtualization:** Distributed System Models and Enabling Technologies. Computer Clusters for Scalable Parallel Computing. Virtual  Machines and Virtualization of Clusters and Data centres.

**Unit II**

**Foundations:** Introduction to Cloud Computing, Migrating into a Cloud, Enriching the ‘Integration as a Service’ Paradigm for the Cloud Era. The Enterprise Cloud Computing   Paradigm.

**Unit III**

**Infrastructure as a Service (IAAS) & Platform and Software as a Service (PAAS / SAAS):** Virtual machines provisioning and Migration services, On the Management of Virtual machines for Cloud Infrastructures, Enhancing Cloud Computing Environments using a cluster as a Service. Secure Distributed Data Storage in Cloud Computing. Aneka, Comet Cloud, T-Systems’, Workflow   Engine for Clouds. Understanding Scientific Applications for Cloud Environments.

**Unit IV**

Monitoring, Management and Applications: An Architecture for Federated Cloud Computing, SLA Management in Cloud Computing, Performance Production for HPC on Clouds, Best Practices in Architecture Cloud Applications in the AWS cloud, Building Content Delivery networks Clouds, Resource Cloud Mashups.

**Unit V**

**Governance and Case Studies:** Organisational Readiness and Change management in the Cloud age. Data Security in the Cloud, Legal issues in Cloud computing. Achieving Production Readiness for Cloud Services

**Text books:**

1. Cloud Computing: Principles and Paradigms  by Rajkumar Buyya,James Broberg, Andrzej M. Goscinski, 2011
2. Distributed and Cloud Computing. Kal Hwang. Geoffeiy C.Fox. Jack J.Dongarra. Elsevier, 2012.

**Books for Reference:**

1. Cloud Computing: A Practical Approach. Anthony T.Velte. Toby J.VeFte, Robert Elsenpeter. Tata McGraw Hill. rp2Oll.
2. Enterprise Cloud Computing Gautam Shroif, Cambridge University Press. 2010.
3. Cloud  Computing: Implementation, Management and Security, John W. Rittinouse, James F Ransome. CRC Press, rp2012.
4. Cloud Application Architectures: Building Applications and Infrastructure in the Cloud. George Reese, O’RedI SPD, rp2Oll.
5. Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance, Tim Mather, Subra Ktriaraswamy, Shahed Latif, O’Redç SPD, rp2Oll.

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**III YEAR – V SEMESTER**

**COURSE CODE: 7BSOE2B**

**ELECTIVE COURSE II (B) – MOBILE TECHNOLOGY**

**Unit I**

**INTRODUCTION**

Mobile Computing – Mobile Computing Vs wireless Networking – Mobile Computing Applications – Characteristics of Mobile computing – Structure of Mobile Computing Application. MAC Protocols – Wireless MAC Issues –Fixed Assignment Schemes – Random Assignment Schemes – Reservation Based Schemes.

**Unit II**

**MOBILE INTERNET PROTOCOL AND TRANSPORT LAYER**

Overview of Mobile IP–Features of Mobile IP–Key Mechanism in Mobile IP–route Optimization. Overview of TCP/IP–Architecture of TCP/IP-Adaptation of TCP Window–Improvement in TCP Performance.

**Unit III**

**MOBILE TELECOMMUNICATION SYSTEM**

Global System for Mobile Communication (GSM)–General Packet Radio Service (GPRS)–Universal Mobile Telecommunication System (UMTS).

**Unit IV**

**MOBILE AD-HOC NETWORKS**

Ad-Hoc Basic Concepts – Characteristics–Applications–Design Issues–Routing–Essential of Traditional Routing Protocols–Popular Routing Protocols–Vehicular Ad Hoc networks (VANET)–MANET Vs VANET– Security.

**Unit V**

**MOBILE PLATFORMS AND APPLICATIONS**

Mobile Device Operating Systems–Special Constrains &Requirements–Commercial Mobile Operating Systems–Software Development Kit: iOS, Android, BlackBerry, Windows Phone –M-Commerce–Structure–Pros & Cons–Mobile Payment System–Security Issues.

**Text Book:**

1. Prasant Kumar Pattnaik, Rajib Mall, “Fundamentals of Mobile Computing”, PHI Learning Pvt. Ltd., New Delhi, 2012

**Books for Reference:**

1. Jochen H. Schiller, “Mobile Communications”, Second Edition, Pearson Education, New Delhi, 2007
2. Dharma Prakash Agarwal, Qing and An Zeng, “Introduction to Wireless and Mobile Systems”, Thomson Asia Pvt. Ltd, 2005
3. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, “Principles of Mobile computing”, Springer, 2003
4. William C.Y. Lee, “Mobile Cellular Telecommunications – Analog and Digital Systems”, Second Edition, Tata MCGraw Hill Edition, 2006
5. C.K. Toh, “Adhoc Mobile Wireless Networks”, First Edition, Pearson Education, 2002
6. Android Developers : <http://developer.androd.com/index.html>
7. Apple Developers : <http://developer.apple.com/>
8. Windows Phone Development Center : <http://developer.windowsphone.com>
9. BlackBerry Developer : http://developer.blackberry.com/

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**III YEAR – VI SEMESTER**

**COURSE CODE: 7BSO6C1**

**CORE COURSE - XII – .NET PROGRAMMING**

# Unit I

The **.**Net Frame work – CLR – Namespace – Assemblies – Class Library – Basic Terminology – **.**Net Component – **.**Net garbage collection.

**Unit II**

Visusalbasic**.**Net – Datatypes – Operators – Arrays – dynamic arrays – String Handling –Conditional and Looping Statement – Subprocedures and functions – Scope – Structures –Modules – Exception Handling – windows Forms – MDI Forms – events – Msgbox – InputBox – working with Multiple forms – Dialogboxes – Passing forms – Anchoring and Docking Controls – event Handling.

## Unit III

**Windows Controls:** Text boxes – RichText Boxes – Labels – Link Labels – Buttons – Checkboxes – Radio Buttons – panels – Listboxes – Combo Boxes – Scroll Bars – Splitters –Track Bars – Pickers – Notify Icons – Timers – Menus – Built in Dialog Boxes –– Toolbars – Status Bars – Progress Bars – Tab Controls.

## Unit IV

**ASP.Net** – File Types – Importing Namespaces – usage of Global.asax file – The Page class – HttpRequest – HttpResponse – Server Utility – Basic Web Controls – List controls –Validation and Rich Controls – Data Controls – HTML Server controls – Custom Controls –State Management – Tracing – Logging and Error Handling – Overview of AJAX Controls. Implementing Security – Security model – Forms Authentication –Windows Authentication.

**Unit V**

**ADO.Net:** Overview of ADO**.**Net – Database Access in the Internet world – Characteristics of ADO**.**Net – Data Objects – Data Namespace – SQL Basics – Data Binding Controls – DataSet – Data Table – Data row – Data column – Data List – Data Grid – Repeater.

**Text Books:**

1. Visual Basic **.**Net Programming – Steven Holzner – Black Book – Dreamtech Press, 2005.
2. The Complete Reference for ASP**.**Net – Matthew MacDonald – Tata McGraw-Hill, 2002.

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**III YEAR – VI SEMESTER**

**COURSE CODE: 7BSO6C2**

**CORE COURSE - XIII – SOFTWARE ENGINEERING**

## Unit I

Introduction: 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 – estimating software maintenance costs. Software Requirements Definition: The software requirements specification – formal specification techniques.

# Unit III

Software Design: Fundamental design concepts – modules and modularization criteria – design notations – design techniques – detailed design considerations – real-time and distributed system design-test plan – milestones, walkthroughs and inspections – design guidelines. Software Implementation: Structured coding techniques – coding style – standards and guidelines.

# Unit IV

Software Testing: A Strategic approach to software testing – strategic issues – unit testing –integration testing – validation testing – system testing – the art of debugging. Software Maintenance: Enhancing maintainability during development – managerial aspects of software engineering – configuration management – source code metrics – other maintenance tools and techniques.

# Unit V

Software Quality Assurance: Quality concepts – software quality assurance – software reviews – formal technical reviews – statistical quality assurance – the SQA plan – the ISO 9000 quality standards.

# Text Book:

1. Software Engineering Concepts – Richard E. Fairley, Tata McGraw Hill Publishing Company Ltd, New Delhi, 2004. (Chapters: 1, 2, 3.1, 3.2, 3.4, 4.1, 4.2, 5, 6.1, 6.2, 6.3, 9)

#### Books for Reference:

1. Software Engineering – A Practitioner’s approach – Roger S. Pressman, (Fourth Edition)McGraw Hill International Editions(Chapters:8,8.3,8.4,8.5,8.7,8.9,8.10,17) 2000.
2. An Integrated Approach to Software engineering – Pankaj Jalote, Narosa Publishing House
3. Fundamentals of Software Engineering, Carlo Ghezzi, Mehdi Jazayeri, Dino Mandrioli, Prentice Hall of India Pvt. Ltd., New Delhi

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**III YEAR – VI SEMESTER**

**COURSE CODE: 7BSO6C3**

**CORE COURSE - XIV – COMPUTER NETWORKS**

**Unit I**

Introduction: Uses of Computer Networks – Network Hardware and network software – Reference models – Example Networks

**Unit II**

The Physical Layer: Theoretical basis for Data Communication – Guided Transmission Media– Wireless Transmission – Communication Satellites – Public Switched Telephone Network – Mobile Telephone System.

**Unit III**

Data Link Layer: Design Issues – Error Detection and Correction – Elementary Data link Protocols: Simplex protocol- Simplex wait and Stop Protocol – 1 bit Sliding Window Protocol-Medium Access Control Layer: Channel Allocation Problem – Multiple Access Protocol – Ethernet**.**

**Unit IV**

Network Layer: Design Issues – Routing Algorithms- shortest path routing- Hierarchical routing algorithm – Broadcast routing – Multicast routing. Transport Layer: Transport Services – Elements of Transport Protocol.

**Unit V**

Application Layer: The Domain Name System – Electronic Mail – World Wide Web. Network Security: Cryptography – Symmetric Key Algorithms – Public Key Algorithms

**Text Book:**

1. Andrew S.Tanenbaum , Computer Networks, Fourth Edition, Prentice Hall of India, 2002.

**Books for Reference:**

1. Uless Black, Computer Networks, PHIE.
2. Data and computer communications, PHI, W.Stallings, 7th Edition, 2006.
3. Data Communication and networking by Behrouz A.Forouzen, Tata McGraw Hill Edition, 4th Edition, 2006.

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**III YEAR – VI SEMESTER**

**COURSE CODE: 7BSO6PR**

**CORE COURSE - XV – PROJECT**

Student must do a project in Computer Applications with the guidance of an Internal teacher. The project has to be submitted in the respective department which is evaluated by the internal and external examiners. The project mark will be sent to the university.

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**III YEAR – VI SEMESTER**

**COURSE CODE: 7BSOE3A**

**ELECTIVE COURSE - III (A) – MULTIMEDIA**

**Unit I**

**Introduction**

What is Multimedia – Resources for multimedia developers – Types of products – Evaluations – Operating Systems and Software – Multimedia computer architecture

**Unit II**

**Text and Graphics**

Elements of Text – Text data files – Using text in multimedia applications – Hypertext – Elements of graphics – Images and color – Graphic file and application formats – Obtaining images for multimedia use – Using graphics in multimedia applications

**Unit III**

**Flash**

Introduction – Menus – Graphic Tools in Flash –Frames, Layers and Scenes – Animation – Adding sound to animation

**Unit IV**

**Photoshop**

Introduction – Working with images – Making Selections – Layers – Filters

**Unit V**

**Coreldraw**

Basics – Drawing – Text – Image – Page Layout

**Text Book:**

1. **“**Flash MX 2004” by Thyagharajan, Anbumani, 2005 Tata McGraw-Hill Publishing Company Limited, New Delhi.

**Books for Reference:**

1. “Flash 5 Bible”, Robert Reinhardt and Jon Warren Lentz, Hungry MindsTM, IDG Books India (P) Ltd.
2. “Photoshop 6 In Depth”, David Xenakis Benjamin Levisay, DreamTech Press, New Delhi.

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**III YEAR – VI SEMESTER**

**COURSE CODE: 7BSOE3B**

**ELECTIVE COURSE - III (B) – DATA MINING AND DATA WAREHOUSING**

**Unit I**

Introduction – Basics of Data Mining – Data Mining Versus Knowledge Discovery in Database – Data Mining Issues – Data Mining Metrics – Social Implications of Data Mining – Data Mining from a Database Perspective

**Unit II**

Database/OLTP Systems – Fuzzy Sets and Fuzzy Logic – Information Retrieval – Decision Support Systems – Dimensional Modeling – OLAP – Web Search Engines.

**Unit III**

Data Mining Techniques: Introduction – A Statistical Perspective on Data Mining – Similarity Measures – Decision Trees – Neural Networks – Genetic Algorithms

**Unit III**

Association Rules: Introduction – Large Itemsets – Basic Algorithms – Parallel and Distributed Algorithms – Comparing Approaches – Incremental Rules – Advanced Association Rule Techniques – Measuring the Quality of Rule Techniques – Measuring the Quality of Rules

**Unit V**

Introduction to Data Warehouse - Delivery Process-Data Warehouse Delivery Method. System Processes-Introduction – Overview – Typical Process Flow Within A Data Warehouse – Extract And Load Process – Clean And Transform Data – Backup And Archive Process – Load Manager – Warehouse Manager – Query Manager-

**Text Books:**

1. Data Mining Introductory And Advanced Topics Margaret H.Dunham Pearson Education [LPE] First Impression, 2006.
2. Data Warehouseing In The Real World Sam Anahory, Dennis Murray Pearson Education [LPE] Thirteenth Indian Reprint, 2005

# Books for Reference:

# Insight Into Data Mining Theory And Practice By K.P.Soman Shyam Diwakar V.Vijay PHI Publication, 2006.

1. Data Warehousing, Data Mining and OLAP By Alex Berson And Stephen J.Smith TMH Publication

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