M.O.P. VAISHNAV COLLEGE FOR WOMEN

(AUTONOMOUS)

Choice Based Credit System

Course of Study for the batch of Candidates admitted in

2016 – 2017

2015 – 2016

2014 – 2015

ACADEMIC YEAR 2016 – 2017

B.Sc.COMPUTER SCIENCE

Activities / Content with direct bearing on Employability/ Entrepreneurship/ Skill Development

Choice Based Credit System
Course of Study for the batch of Candidates admitted in 2016 – 2017

M.O.P. VAISHNAV COLLEGE FOR WOMEN (AUTONOMOUS), CHENNAI-34
(Effective for the batch of Candidates admitted in 2016 - 2017)

B.Sc. COMPUTER SCIENCE

CORE I - PROGRAM DESIGN WITH C
COMMON TO B.Sc. COMPUTER SCIENCE & B.C.A.

COURSE CODE: 15UCSC302& 15UCSC302P	**YEAR/SEMESTER:I/I**	**MAX MARKS: 100**	**Theory :60 marks** **Practical :40 marks**
COURSE TYPE: THEORY & PRACTICAL	**CREDITS: 4**	**TOTAL TEACHING HOURS: 60**	**Theory :36 Hrs** **Practical : 24 Hrs**

COURSE OBJECTIVES:

- To Understand the basic programming principles
- To Understand problem solving using flowcharts, algorithms
- To Recognize the basic concepts of C Program
- To Understand the principles of code design , documentation and coding standards

UNIT I
Introduction to programming
Introduction, Kinds of Flowcharts, Symbols used in flowcharts, Constants and variables, Advantages of flowchart (6 Hrs)

UNIT II
PseudoCode and Flowchart
Pseudo Code, Flowchart – Selection, Multiple Selection, Iteration using for, while and do while, Problems on array, one dimensional. (8 Hrs)

UNIT III
Subscripted Variables
Introduction, Basic concepts of subscripted variables, one dimensional array, Tracing Logic. **Files -** Introduction to file structure, Concept of a Data File, Types of Data files, File Organizations, File Processing. (6 Hrs)

UNIT IV
Introduction to C
Constants, Variables and Data Types – Introduction, Character set, Tokens, Keywords and Identifiers, Constants, Variables, Data Types. Operators and Expressions - Types of operators, Operator precedence, Evaluation of expressions. Input and Output functions – scanf, printf. (8 Hrs)

UNIT V
Control Structures in C

Control structures – if, if-else, nested if-else, else-if ladder, switch, Conditional operator, While, do-while, for, break, continue statements, **G**oto statement, Simple programs.

(8 Hrs)

TEXT BOOKS:

- Raj K Jain (2002), Insight into Flowcharting. Sultan Chand Publishers, New Delhi.
- Anil Bikas Chaudhuri, The art of programming through flowcharts and algorithms. Firewall Media, New Delhi
- E . Balaguruswamy(2010) , Programming in ANSI C, fifth edition ,TMH, New Delhi.

REFERENCE BOOK:

- Yashwant P Kanitkar(2008), Let Us C, Infinity Science Press - Eighth Edition, New Delhi

ACTIVITY PLANNER

List of activities for Employability / Skill Development / Entrepreneurship Skill Development
(Course faculty may conduct any, all or any other activities as well)

- **New Product Development in C** – Application based project Bank Management system, Inventory system, Simple Arithmetic Calculator,
- **Google form** to create & grade MCQs - Operators and Expressions, Input/ Output statement – scanf, printf.
- **Debug Entity : Troubleshooting code snippets. Code snippets on** Conditional control and loop control structures**.**

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PROGRAM DESIGN WITH C – PRACTICAL

LIST OF PROGRAMS (24 Hours)

Develop Flowchart and write programs in C for the following:

I. Sequence Structures:

1. Programs to implement Formatted I/O.
2. Programs to implement Arithmetic Operators.
3. Programs to implement Assignment Statements.
4. Programs to implement Auto-increment and auto-increment operators.

II. Branching Control Structures:

5. Programs to implement simple if.
6. Programs to implement nested if.
7. Programs to implement else-if ladder.
8. Programs to implement switch-case.
9. Programs to implement logical operators.
10. Programs to implement go to statement.

III. Looping Control Structures:

11. Programs to implement unconditional looping.
12. Programs to implement for loop.
13. Programs to implement while loop.
14. Programs to implement do-while loop.

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B.Sc. COMPUTER SCIENCE

CORE: II - DIGITAL LOGIC FUNDAMENTALS

COURSE CODE: 14UCSC303& 14UCSC303P	**YEAR/SEMESTER: I/I**	**MAX MARKS: 100**	**Theory :60 marks** **Practical :40 marks**
COURSE TYPE: THEORY & PRACTICAL	**CREDITS: 4**	**TOTAL TEACHING HOURS: 60**	**Theory :36 Hrs** **Practical : 24 Hrs**

COURSE OBJECTIVES:

- To understand formal foundations
- To implement selected design techniques
- To design digital logic system

UNIT I

Number systems

Number systems - Conversion from one number system to another, Complements, Binary codes, Binary logic – Logic gates – Truth tables. (7 Hrs)

UNIT II

Boolean Algebra and Simplification

Boolean Algebra – Boolean Algebra- laws –Axioms, Truth table simplification of Boolean function – map method (upto 5 variables) Mc clausky tabulation method (7 Hrs)

UNIT III

Sequential circuits and Counters

Sequential logic – RS,JK, D and T flip flops, Application of flip flops, Registers – Shift Registers, Counters – Ripple Counters , Synchronous Counters, Design of Counters (8 Hrs)

UNIT IV

Combinational Circuits and their applications

Adders , Subtractors, Decoders, Encoders, Multiplexer, Demultiplexer, Design of Circuits using decoders, Multiplexers, ROM , Comparison of RAM & ROM, PLA – Designing circuits using ROM / PLA. (7 Hrs)

UNIT V

Computer Design

Design of ALU, Design of Status register, Design of Accumulator (7 Hrs)

TEXT BOOK:

- Donald .P. Leach & A.P. Malvino, Gautamsala (2011),Digital Principles and Applications, Seventh Edition, Special Edition 2011, TMH, New Delhi.

REFERENCE BOOKS:

- T.C. Bartee,(2008), Digital Computer Fundamentals, sixth edition , Tata McGraw Hill, New Delhi.
- M. Moris Mano (2001). Digital Logic and Computer Design, PHI, New Delhi.
- V.Vijayendran (2009). Digital Fundamentals. S.Viswanathan publishers, Chennai.

ACTIVITY PLANNER

List of activities for Employability / Skill Development / Entrepreneurship Skill Development
(Course faculty may conduct any, all or any other activities as well)

- **RSQC2 (Recall, Summarize, Question, Connect and Comment):** Students take up this activity, where they follow through all the steps that evaluates their Understanding of the digital logic circuit components. This helps to recall the components, describe them and identify their purpose in a particular circuit.
- **Application Cards**: Students generate examples of real-world applications for Logic Circuit Design and Implement working models.
- **Concept Maps**: Students connect various simplification and design techniques to realise an efficient and Cost effective Logic Circuits. This helps them to Upskill their Circuit Analysis Aptitude.

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DIGITAL LOGIC FUNDAMENTALS -PRACTICAL
LIST OF PROGRAMS (24 Hrs)

I. STUDY OF LOGIC GATES

1. Verification of truth table for AND ,OR, NOT, NAND, NOR and XOR gates
2. Realisation of NOT, AND, OR, EX-OR gates with only NAND gates
3. Realisation of NOT, AND, OR, EX-OR gates with only NOR gates

II. IMPLEMENTATION OF LOGIC CIRCUITS

1. Verification of Associative law for AND, OR gates.
2. Karnaugh's Map reduction and logic circuit implementation

III .ADDER AND SUBTRACTOR

1. Verification of Demorgan's Law
2. Implementation of Half-Adder and Half- Subtractor.
3. Implementation of Full-Adder and Full- Subtractor.
4. Four bit binary Adder.
5. Four bits binary subtractor using 1's and 2's complement.

IV.SHIFT REGISTERS

1. Implementation of Shift Registers, Serial Transfer
2. Ring Counter
3. 4- bit binary counter
4. BCD Counter
5. Counters for arbitrary sequence.

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B.Sc. COMPUTER SCIENCE

ALLIED I - STATISTICS
COMMON TO B.Com (Accounting & Finance), B.Com (Marketing Management), B.Com (Corporate Secretaryship), B.Sc (Computer Science), B.C.A, B.B.A

COURSE CODE: 14UMAT307 &14UMAT307P	**YEAR/SEMESTER:** I/I	**MAX MARKS: 100**	**Theory :80 marks** **Practical :20 marks**
COURSE TYPE: THEORY & PRACTICAL	**CREDITS: 5**	**TOTAL TEACHING HOURS: 75**	**Theory :50 Hrs** **Practical : 25 Hrs**

COURSE OBJECTIVES:

- To develop skills in analysis & interpretation of data
- Handle challenging problems using appropriate analysis tools

UNIT I
Statistics
Introduction, Meaning, Definition, Scope and Limitations of Statistics, Collection, Classification and Tabulation of Statistical data, Diagrammatic and Graphical Presentation of Statistical data, Measures of Central Tendency – Mean, Median and Mode. (8 hours)

UNIT II
Measures of Dispersion
Introduction, Significance, Range, Quartile deviation, Mean deviation, Standard deviation, Co-efficient of variation.
Correlation
Introduction**,** Significance, Types of correlation, Karl Pearson's co-efficient of correlation and Rank co-efficient of correlation, Regression Analysis. (8 hours)

UNIT III
Tests of Hypothesis
Introduction, Procedure of Testing Hypothesis, Two types of Errors, One tailed and two tailed tests, Standard Error.
Large samples- Tests of significance for Single Mean, Difference of Means.
Small Samples- t test for Single Mean, Difference of Means, Paired t tests.
Non-Parametric test- Chi-Square for goodness of fit (excluding fitting of distributions) and test for association of attributes. (10 hours)
UNIT IV
Analysis of Time series
Introduction, Components of time series, Measurement of Trend- Graphic Method, Method of Semi-averages, Method of Moving Averages, Method of Least Squares,

Measurement of seasonal variations - Method of Simple Averages (Weekly, Monthly or Quarterly),Simple Problems. (9 hours)

UNIT -V

Probability

Introduction, Definitions, Addition and Multiplication Theorem, Conditional probability, Baye's theorem, Simple Problems (Statement only for all the theorems).

Index Numbers

Introduction, Uses of Index Numbers, Methods of Constructing Index Numbers: Unweighted Index Numbers- Simple Aggregative Method, Weighted Index Numbers – Laspeyres, Paasche's, Bowley's and Fischer's Ideal Index numbers, Tests of Adequacy of Index number Formulae – Time and Factor Reversal Tests, Cost of living index- Aggregate Expenditure Method, Family Budget Method. (10 hours)

Theory: Problem Ratio=30:70

TEXT BOOK:

- S.P. Gupta (2008) Statistical methods, Sultan Chand & Sons.

REFERENCE BOOKS:

- P.R.Vittal (2009), Mathematical Statistics, Margham Publications.
- Murray R Spiegel, Larry J Stephen (1999) Schaum"s Outline of Theory & Problems of Statistics, Mcgraw Hill.
- Sharma (2007) ,Business Statistics , Pearson Education.
- G C .Beri (2005) Business Statistics, Tata Mcgraw Hill.

ACTIVITY PLANNER

List of activities for Employability / Skill Development / Entrepreneurship Skill Development
(Course faculty may conduct any, all or any other activities as well)

Find a Pattern - Generate a chart for the data and apply a trend line to it to show the trend of past data, which provides an option to generate a forecast of future data that is based on the pattern of your past data.

Track the Time - Analyze a sequence of data points collected over an interval of time to give conclusions

Seminar – Understand, discuss and share the information on a particular topic.

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ALLIED I - STATISTICS PRACTICAL

- **DIAGRAMMATIC REPRESENTATION**
  Column, Bar Diagram, Line, Pie and Area

- **METHODS OF CENTRAL TENDENCY**
  Mean, Median, Mode.

- **MEASURES OF DISPERSION**
  Standard deviation, Quartile deviation, Range

- **CORRELATION**
  Correlation co-efficient

  Rank Correlation (without repeated ranks)

  Regression co-efficient and Regression lines

- **TESTS OF SIGNIFICANCE**
  Small samples- t test for single mean, difference of means and paired t test.

  Chi-square for independence of attributes.

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CORE: III - PROGRAMMING IN C
COMMON TO B.Sc. COMPUTER SCIENCE & B.C.A.

COURSE CODE: 15UCSC310 & 15UCSC310P	**YEAR/SEMESTER: I/II**	**MAX MARKS: 100**	**Theory :60 marks** **Practical :40 marks**
COURSE TYPE: THEORY & PRACTICAL	**CREDITS: 4**	**TOTAL TEACHING HOURS: 60**	**Theory :36 Hrs** **Practical : 24 Hrs**

COURSE OBJECTIVES:

- Acquire a solid foundation in C, the multi-platform programming language
- Recognize the basic concepts of C Program
- Create and solve modular programs.

UNIT I
Arrays
Review of Fundamentals concepts of 'C', Arrays - Declaration and processing arrays, Handling of Character arrays, Multi - Dimensional Arrays, practical implementation. (6 Hrs)

UNIT II
Functions and Structures
Functions - Definition, Prototype, Categories of functions, Passing arguments, Passing arrays to functions, Recursion, Storage Classes-Automatic ,External , Static and Register Variables. Structures – Definition, initialization, Array of structures, Array within structures, Nested structures, Structures and Functions, Self - referential Structures, Unions. (8 Hrs)

UNIT III
Pointers and Files
Pointers - Declaration, initialization, Pointer operations, Pointers and arrays, Pointers and Structures. File Management - Creating, Opening, Processing and Closing a file. Command line arguments – File combinational modes. (9 Hrs)

UNIT IV
Linked Lists
Dynamic Memory Allocation – Linked lists , Basic list Operations. The Preprocessor – Macro Substitution, Compiler Control Directives, File inclusion. (8 Hrs)

UNIT V
Graphics
Simple Programs using C Graphics - Basic Commands in C Graphics (5 Hrs)

TEXT BOOKS:

- E . Balaguruswamy(2010), Programming in ANSI C, Fifth Edition, TMH, New Delhi.
- Yashwant Kanetkar(1998), Graphics under C, BPB Publications, New Delhi.

REFERENCE BOOKS:

- H. Schildt(2000) , C: The Complete Reference , Fourth Edition , TMH Edition, New Delhi.
- Gottfried. B.S (1996) , Programming with C , Second Edition , TMH Pub.Co.Ltd, New Delhi 1996.
- Y.Kanetkar(1999), Let Us C, Second Edition, BPB Publications, New Delhi.
- B.W.Kernighan and D.M. Ritchie(1998), The C Programming Language , Second Edition , PHI, New Delhi

ACTIVITY PLANNER

List of activities for Employability / Skill Development / Entrepreneurship Skill Development

(Course faculty may conduct any, all or any other activities as well)

- **Debug Warriors :** Troubleshooting code snippets . Code snippets on data types, control structures and pointers.
- **Group Discussion** – Static and Dynamic memory allocation. Graphic drawing tool and plotting on graphic screen.
- **Test case Development :** Enables to develop error free application. Acquire Testing skill by experiencing testing phase while developing test case. Test case generation for finding the greatest

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PROGRAMMING IN C - PRACTICAL

LIST OF PROGRAMS (24 Hrs)

Write programs in C for the following:

1. Programs to implement One-dimensional array.
2. Programs to implement Two-dimensional array.
3. Programs to implement Strings.
4. Programs to implement Functions
5. Programs to implement Recursive Functions.
6. Programs to implement Structures.
7. Programs to implement Unions.
8. Programs using Pointers.
9. Programs using Files.
10. Programs using Dynamic memory allocation.
11. Programs using Command-line arguments.

Graphics:

1. Design a blue-print of your House in C.
2. Design a car & apply movements.
3. Design bouncing ball game in C.
4. Animated programs in Graphics.

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B.Sc. COMPUTER SCIENCE

CORE IV - COMPUTER ARCHITECTURE AND MICROPROCESSOR

COURSE CODE: 14UCSC306 & 14UCSC306P	**YEAR/SEMESTER: I/II**	**MAX MARKS: 100**	**Theory :60 marks** **Practical :40 marks**
COURSE TYPE: THEORY & PRACTICAL	**CREDITS: 4**	**TOTAL TEACHING HOURS: 60**	**Theory :36 Hrs** **Practical : 24 Hrs**

COURSE OBJECTIVES:

- To provide students with the knowledge of basic computer system hardware building blocks, computer organization and architecture and maintenance
- Introduce the fundamental techniques on which high performance computing is based
- To develop the foundations for analyzing the benefits of design options in computer architecture.

UNIT I
Evolution of Computers
Evolution of Computers: Generation of computers - Computer System, Components – Functions , Interconnection Structures – Bus Interconnections**.** (6 Hrs)

UNIT II
Memory Organization
Memory**-** Characteristics – Hierarchy , Cache Memory Principles, Internal Memory, Semiconductor main memory, Organisation – DRAM , SRAM , ROM, External Memory: Magnetic Disk , RAID , Optical Memory, Magnetic Tape , ROM & its types. (8 Hrs)

UNIT III
Instruction Set and Instruction Cycle
Instruction set Characteristics – Types of operands – Types of operations , Addressing Modes, Instruction formats- Instruction Execution characteristics, CPU- Processor Organisation – Register Organisation, Instruction Cycle –Instruction Pipelining, RISC Characteristics – RISC Pipelining. (9 Hrs)

UNIT IV
Control Unit
Micro-Operations, Control of processors, Hardwired Implementation, Microprogrammed Implementation, Microprogrammed Control concepts, Micro Instruction Sequencing , General microinstruction execution. (9 Hrs)

UNIT V

8086 Architecture

Pin Configuration- 8086 Minimum and Maximum Mode Configurations, Addressing Modes, Basic Instructions , Interrupts , Assembly Level Programming, Comparison of various types of addressing modes of 8086 MPU (4 Hrs)

TEXT BOOKS:

- William Stallings (2010), Computer Organisation & Architecture: Designing for performance, Eighth Edition, PHI, New Delhi.
- Douglas V. Hall (1999), Microprocessor and Interfacing, Programming In Hardware, Second Edition, Tata Mac Graw Hill, New Delhi.
- Mathur ,Sunil.(2011) Microprocessor 8086: Architecture, programming & interfacing, PHI, New Delhi.
- Dhanpat Rai (2010), Intel 8086/8088 Microprocessors Architecture, Programming Design, New Delhi.

REFERENCE BOOKS:

- Avtar Singh, Walter A. Triebel, (1990), 8086 And 80286 Microprocessor: Hardware, Software And Interfacing, Prentice Hall of India, New Delhi.
- Morris Mano (2009), Computer System Architecture, Third Edition, Pearson, New Delhi.

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List of activities for Employability / Skill Development / Entrepreneurship Skill Development
(Course faculty may conduct any, all or any other activities as well)

- **Talk it Out:** "Evolution of Computers" – Groups to present evolution of computer architecture through each generation of Computers .
- **Analysis by comparison**: "Memory elements used in Computer"- each group to identify themselves as one type memory element, they should describe themselves and spell out their pros and cons.
- Project demonstrating the application of microprocessor for real life use cases

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MICROPROCESSOR – PRACTICAL

LIST OF PROGRAMS (24 Hrs)

1. Byte and word transfer in different addressing modes.
2. Block transfer without overlap
3. Block transfer with overlap
4. Block exchange
5. 16 bit Addition/Subtraction
6. 32 bit Addition/Subtraction
7. ASCII adjust after Addition/Subtraction
8. 16 bit Multiplication/Division
9. 32 bit Multiplication
10. 16-bit signed Multiplication
11. Signed Division of word by a byte
12. ASCII adjust after Multiplication
13. Square of a word
14. Cube of a byte
15. Cube of a word
16. LCM of two numbers
17. HCF of two numbers
18. Factorial of a number
19. Binary to BCD conversion
20. BCD to Binary conversion
21. Bit manipulation to check if the data is positive or negative
22. Bit manipulation to check if the data is odd or even
23. Bit manipulation to count the number of 1's and 0's in given data
24. Bit wise Palindrome
25. Bit manipulation to check 2 out of 5 code
26. Addition/Subtraction of array of words
27. Largest/Smallest element in an array
28. Sorting array in Ascending/Descending order
29. String transfer
30. String reverse
31. Character search in a string
32. Palindrome in a String

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B.Sc. COMPUTER SCIENCE

ALLIED II - MATHEMATICS FOR COMPUTER SCIENCE

COURSE CODE: 14UMAT306	**YEAR/SEMESTER: I/II**	**MAX MARKS: 100**
COURSE TYPE: THEORY	**CREDITS: 5**	**TOTAL TEACHING HOURS: 75**

COURSE OBJECTIVES:

- To provide the fundamental knowledge of the mathematical concepts
- To understand and apply the knowledge of concepts in their respective fields
- To develop problem solving skills

UNIT I
Matrices
Systematic, Skew, Symmetric, Hermitian and Skew Hermitian, Orthogonal and Unitary Matrices, Rank of a Matrix, Consistency of Equation, Eigen Roots and Eigen Vectors, Cayley – Hamilton Theorem (without proof) Verification of Inverse Matrix, Computation of inverse matrix. (17 Hrs)

UNIT II
Trignometry
Expansion of sin x, cos x, tan x in terms of 'x', Expansion of sin ^n x, cos^ n x, sin (nx), cos (nx), tan (nx), Hyberbolic and Inverse Hyberbolic Functions. (13 Hrs)

UNIT III
Differential Calculus
n^{th} Derivative, standard results of n^{th} derivative, Leibnitz Theorem (without proof) and Applications, Jacobians, standard results of n^{th} derivative. (17 Hrs)

UNIT IV
Integral Calculus
Bernoulli's Formula, Reduction Formulae, Simple Problems related to Definite Integrals, Properties of definite integrals (13 Hrs)

UNIT V
Differential Equations
Secord Order Differential Equations with constant co-efficients. Evaluation of Particular integral of the Equation – Special methods for x^ k where k is positive integer. e^ax f(x) where f(x) is any function of x, Second Order Differential Equations with variable co-efficients. (15 Hrs)

TEXT BOOK:

- P. R Vittal (2009), Allied Mathematics, Fourth Edition, Margham Publications, Chennai

REFERENCE BOOKS:

- A Singaravelu (2002), Differential Equations, Fourier series and Laplace Transforms, First Edition, Meenakshi Agency, Chennai.
- S. Narayanan, T.K. Manickavachagam Pillay, Calculus (volume 3).
- S. Viswanathan (1999).Differential Equations & Fourier Series Revised Eighteenth Edition, S. Viswanathan publishers, Chennai

ACTIVITY PLANNER

List of activities for Employability / Skill Development / Entrepreneurship Skill Development
(Course faculty may conduct any, all or any other activities as well)

Glossary of Terms – The set of important terms to be remembered for solving the problems. Serves as a dictionary for reference throughout their course

Divergent Thinking – Identify how Mathematics is applied in various fields

Break with Brainstorming – Answer questions in a minute that are displayed on the screen

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B.Sc. COMPUTER SCIENCE
NON MAJOR ELECTIVE I- PUBLISHING SOFTWARE I

COURSE CODE: **10UNME 411A**	**YEAR/SEMESTER:** I/II	**MAXIMUM MARKS:** 100
COURSE TYPE: PRACTICAL	**CREDITS:2**	**TOTAL TEACHING HOURS:30**

COURSE OBJECTIVES:

To familiarize with the publishing software application

To give hands-on-experience in the publication domain.

UNIT – I

Introduction into Microsoft Publisher - Starting Up Microsoft Publisher.

UNIT – II

Creating a publication with a wizard - Quick Publication Wizard with a blankPublication.

UNIT – III

Create a new publication based on a template - Start a publication from scratch.

WEBSITES:

http://microsoft.com/office/publisher/default.htm

ACTIVITY PLANNER

List of activities for Employability / Skill Development / Entrepreneurship Skill Development
(Course faculty may conduct any, all or any other activities as well)

EM: Practical exposure: Hands on training for model based Customized publication to enhance creative skills.

SD: Printing publication: Advertisement model based publication to be designed for skill based development

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B.Sc. COMPUTER SCIENCE
NON MAJOR ELECTIVE II- PUBLISHING SOFTWARE II

COURSE CODE: **10UNME411B**	**YEAR/SEMESTER:** I/II	**MAXIMUM MARKS:** 100
COURSE TYPE: PRACTICAL	**CREDITS:2**	**TOTAL TEACHING HOURS:30**

COURSE OBJECTIVES:

To develop wide range of publication designs based on the templates

To create Publication designs based on the Client Requirements**.**

UNIT – I

Open an existing publication - Pack your publication to take to another computer.

UNIT – II

Set up a publication for black and white commercial printing

WEBSITES:

http://microsoft.com/office/publisher/default.htm

ACTIVITY PLANNER

List of activities for Employability / Skill Development / Entrepreneurship Skill Development
(Course faculty may conduct any, all or any other activities as well)

EM:Print based Projects: Requirement based projects provided by the organisation in a team enhances creative skills

SD: Skill Check: Blueprints were developed for new patterns and designs

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B.Sc. COMPUTER SCIENCE

CORE V - PROGRAMMING IN C++ AND DATA STRUCTURES

COURSE CODE: 14UCSC317 & 14UCSC317P	**YEAR/SEMESTER: II/III**	**MAX MARKS: 100**	**Theory :60 marks** **Practical :40 marks**
COURSE TYPE: THEORY & PRACTICAL	**CREDITS: 4**	**TOTAL TEACHING HOURS: 60**	**Theory :36 Hrs** **Practical : 24 Hrs**

COURSE OBJECTIVES:

- To acquire the knowledge in object oriented programming
- To recognize the components of C++ programming
- To create and solve modular programs
- To understand the underlying organization of various important data structures

UNIT I

Introduction to C++

Introduction to C++, Tokens, Keywords, Identifiers, Variables, Operators, Manipulators, Expressions and Control Structures in C++, Pointers- Functions in C++ - Main Function- Function Prototyping- Parameters Passing in Functions – Values Return by functions- Inline functions – Friend functions and Virtual functions, Control Structures in C++. (7 Hrs)

UNIT II

CLASSES & OBJECTS

Classes and Objects, Constructors and Destructors, and Operator Overloading and Type Conversions – Type of Constructors – Function Overloading. Inheritance: Single Inheritance, Multilevel Inheritance – Multiple Inheritance – Hierarchical Inheritance – Hybrid Inheritance. Pointers, Virtual Functions and Polymorphism; Managing Console I/O operations , Examples of inheritance and function overloading. (8 Hrs)

UNIT III

Working with Files

Classes for File Stream Operations – Opening and Closing a File – End-of-file Deduction – File Pointers- Updating a file

Data Structures: Definition of a Data Structure – primitive and composite Data Types. Arrays, Operation on arrays, Order lists. (7 Hrs)

UNIT IV

DATA STRUCTURES

Stacks- Application of stack – Infix to Postfix Conversion, Recursion – Queues – Operations on queues, Queue Applications, Circular queue, singly linked list – Operations, Application – Representation of a polynomial, Polynomial addition; Doubly Linked List – Operations, Real time examples of stack, queues, and linked lists. (7 Hrs)

UNIT V

Trees & Graphs

Trees and Graphs: Binary trees, Operations – Tree Traversals; Graph – Definition, Types of graphs, Traversal – Shortest Path; Dijkstra's Algorithm, Applications of trees and graphs.

(7 Hrs)

TEXT BOOKS:

- E. Balagurusamy(2008), Object Oriented Programming with C++, Tata McGraw-Hill Publishing Company Ltd.,
- E.Horowitz, S.Sahni and Dinesh Mehta (2006),Fundamentals of Data Structures in C++, Galgotia Publication.

REFERENCE BOOKS:

- Schildt, C++ (2003) The Complete Reference, TMH, New Delhi.
- Robert Lafore(2009), Object Oriented Programming in Microsoft C++, Galgotia publication, Fourth Edition.
- R.Kruse C.L Tondo B.Leung and Shashi Mogalla (2009), Data Structures and Program design in C,Pearson,4th impression.

ACTIVITY PLANNER

List of activities for Employability / Skill Development / Entrepreneurship Skill Development
(Course faculty may conduct any, all or any other activities as well)

- **Projects** on Implementation of Data Structure Concepts in C++ in-stills life-long learning and improves interpersonal skills
- Preparation of a resume using I/O function
- Assignment on graph traversals.
- Class presentations on Graph Traversals
- Case study on conversion of an infix to postfix and prefix expression.

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PROGRAMMING IN C++ AND DATA STRUCTURES- PRACTICAL

LIST OF PROGRAMS (24 HRS)

Write programs in C++ for the following

1. Implement stack using arrays
2. Program using friend functions
3. Program using function overloading
4. Implement Overloading of unary operator
5. Implement Overloading of binary operator
6. Implement Single Level Inheritance
7. Implement Multilevel Inheritance
8. Implement Multiple Inheritance
9. Mark sheet processing using files
10. Implement stack using templates
11. Program to implement exception handling

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B.Sc. COMPUTER SCIENCE

CORE VI - DATABASE MANAGEMENT SYSTEMS
COMMON TO B.Sc. COMPUTER SCIENCE & B.C.A.

COURSE CODE: 14UCSC312 & 14UCSC312P	**YEAR/SEMESTER: II/III**	**MAX MARKS: 100**	**Theory :60 marks** **Practical :40 marks**
COURSE TYPE: THEORY & PRACTICAL	**CREDITS: 4**	**TOTAL TEACHING HOURS: 60**	**Theory :36 Hrs** **Practical : 24 Hrs**

COURSE OBJECTIVES

- To develop an understanding of the classic data models.
- To become familiar with the concepts of managing databases.

UNIT I
Database Concepts

Database Concepts - Database System Applications – Database systems versus File Systems – View of Data – Data Models, Network and Relational Models – Database Languages – Database users and Administrators – Transaction Management – Database system Structure – Application Architecture. E-R Model – Basic Concepts-Constraints-keys – E-R Diagram-Reduction of E-R Schema- UML- Design of an E-R Database Schema (8 Hrs)

UNIT II
Relational Model

Relational model - Relational Algebra- Extended Relational-Algebra Operations – Modification of the Database – Views - Tuple Relational Calculus-Domain Relational Calculus (7 Hrs)

UNIT III
Relational Database

Relational Database - SQL – Basic structure – DDL – DML – DCL - Set Operations – Aggregate functions - Sub Queries – Join Relation –Views – Cursors – Triggers - PL/SQL – Procedural Constructs – Functions - Procedures – Packages - Embedded SQL – Dynamic SQL. (7 Hrs)

UNIT IV
Integrity & Security

Integrity & Security – Domain Constraints – Referential Integrity – Assertion-Triggers-Authorization in SQL – Relational Database Design – 1st,2nd,3rd,4th,BCNF Normal forms, Decomposition (7 Hrs)

UNIT V
Database System Architecture

Database System Architecture-Centralised and Client Server Architecture-Server System Architecture-Parallel Systems-Network types-Distributed Systems. (7 Hrs)

TEXT BOOK:

- A.Silberschatz , H.F.Korth and Sudharsan (2010), Database System Concepts , Sixth Edition, TMH International Edition.

REFERENCE BOOKS:

- Gerry M. Litton, Introduction to Database Management – A Practical Approach – S.Chand & Company Ltd. New Delhi.
- Fred R. McFadden, Jeffery A. Hoffer, Mary B.Prescott, Modern Database Management, Fifth Edition, Pearson Education.

ACTIVITY PLANNER

List of activities for Employability / Skill Development / Entrepreneurship Skill Development
(Course faculty may conduct any, all or any other activities as well)

- Data Dive -Identify Database systems and file systems and appreciate the use of DBMS
- Data Decision-Comparison of the various database systems

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RDBMS - PRACTICAL

LIST OF PROGRAMS (24 Hrs)

SQL

a. Data Definition Language :Data Types ,Constraints, Views
b. Data Manipulation Language :
   i. Operators: Arithmetic ,Comparison,Logical,Set
   ii. Function: Numeric,Character,Date,Group
   iii. Joins
c. DCL : Grant ,Revoke
d. Data Transaction : Commit ,Rollback

PL/SQL

a. Simple PL/SQL block with control structures
b. Cursors:Implicit/Explicit
c. Exception
d. Stored Procedure & Functions

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B.Sc. COMPUTER SCIENCE

ALLIED III - DISCRETE MATHEMATICS FOR COMPUTER SCIENCE

COURSE CODE:14UMAT313	**YEAR/SEMESTER:**II/III	**MAX MARKS: 100**
COURSE TYPE: THEORY	**CREDITS:5**	**TOTAL TEACHING HOURS: 75**

COURSE OBJECTIVES:

- Increases mathematical logic to enhance knowledge processing
- Introduction to Graph Theory and its applications

UNIT I

Mathematical Logic

Introduction, Statements and Notation, Connectives – Negation, Conjunction, Disjunction, Statement Formulas and Truth Tables, Conditional and Biconditional, Well-formed Formulas, Tautologies, Equivalence of Formulas, Duality Law, Tautological Implications, Formulas with Distinct Truth Tables, Functionally Complete Sets of Connectives, Other Connectives
(15 Hrs)

UNIT II

Normal Forms

Disjunctive Normal Forms, Conjunctive Normal Forms, Principal Disjunctive Normal Forms, Principal Conjunctive Normal Forms - The Theory of Inference for the Statement Calculus - Validity Using Truth Tables, Rules of Inference, Consistency of Premises and Indirect Method of Proof (15 Hrs)

UNIT III

The Predicate Calculus

Predicates, The Statement Function, Variables, and Quantifiers, Predicate Formulas, Free and Bound Variables, The Universe of Discourse - Inference Theory of the Predicate Calculus - Valid Formulas and Equivalences, Some Valid Formulas over Finite Universes, Special Valid Formulas Involving Quantifiers, Theory of Inference for the Predicate Calculus, Formulas Involving More Than One Quantifier (15 Hrs)

UNIT IV

Graph Theory

Introduction - Data Structures, Graphs and Multigraphs, Subgraphs, Isomorphic and Homeomorphic Graphs, Path, Connectivity, The Bridges of Konigsberg, Traversable Multigraphs, Hamiltonian Graphs (15 Hrs)

UNIT V

Weighted Graphs and Graph Colouring

Labeled and Weighted Graphs – Complete, Regular, and Bipartite Graphs, Tree Graphs, Planar Graphs, Graph Colorings, Representing Graphs in Computer Memory, Graph Algorithm (15 Hrs)

TEXT BOOKS:

- J.P Tremblay, R.Manohar , Discrete Mathematical structures with applications to computer science, Tata Mc.Graw Hill.
- Seymour Lipschutz, March Lipson, Schaum's Outlines Discrete Mathematics. Second Edition, Schaum's Outline series.

REFERENCE BOOKS:

- Bernard Kolman, Robert .C.Busbey, Discrete Mathematical Structures, Third Edition, PHI ,
- Kenneth.H.Roger, Discrete Mathematics and its Applications , Fifth Edition, Tata Mc Graw hill,
- Narsingh Deo, Graph Theory with Applications to Engineering and Computer Science, Edition 2003.

ACTIVITY PLANNER

List of activities for Employability / Skill Development / Entrepreneurship Skill Development
(Course faculty may conduct any, all or any other activities as well)

Glossary of Terms – The set of important terms to be remembered for solving the problems. Serves as a dictionary for reference throughout their course

Assignment - Solve one new problem under each topic to reinforce the concepts learnt in class and motivate students to explore more

Track and Test – Solve problem using the concept of trees and graphs for implementation

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B.Sc. COMPUTER SCIENCE

ELECTIVE I – HYPERTEXT PREPROCESSOR AND MYSQL
COMMON TO B.Sc. COMPUTER SCIENCE & B.C.A.

COURSE CODE: 15UCSC303	**YEAR /SEMESTER:** II/III	**MAXIMUM MARKS:** 100
COURSE TYPE: PRACTICAL	**CREDITS:** 5	**TOTAL TEACHING HOURS:** 75

COURSE OBJECTIVES

- Understand the basics of using PHP.
- Use it to build dynamic web pages.
- Determine how simple database queries can be constructed using MySQL and PHP.
- Implement the basics of MySQL database tables by adding, changing and deleting data using PHP and HTML forms.

Hypertext processor (PHP)

- Introduction to HTML
- Control structures.
- operators
- Built in functions-String, Math, Array functions
- Functions
- Create forms using Get and Post Method
- Graphics
- PHP and MYSQL Connectivity

MYSQL

- Creating a database
- Creating a table
- Inserting records in a table
- Altering the table structure.
- Deleting data from table
- Updating data from table.
- Select command
- Where clause
- Aggregate functions
- Numeric functions (Absolute, ceiling, floor, modulo, round off, square, Square Root, power)
- Constraints
- Group By, Having

- Operators (and, or, not between, In , not in, is null, is not null, like, Order By)
- String Functions (Lower, Upper, Replace, left-trim, right-trim, substring, Length, rename)
- Drop (table, database)
- Truncate
- Sub Queries , Alias

TEXT BOOKS:

- Christopher Johnes& Allison Holloway (2007), Underground PHP, Oracle Press.
- Gaborhojtsy, PHP Manual, PHP Documentation Group
- Seyed M.M. Tahaghoghi, Hugh Williams (2007), Learning MySQL ,O'Reilly Media Inc.

ACTIVITY PLANNER

List of activities for Employability / Skill Development / Entrepreneurship Skill Development
(Course faculty may conduct any, all or any other activities as well)

- **Web development with database connectivity using PHP and MySQL**
- **Real time Projects on Website creation to inculcate practical knowledge**
- **To create dynamic web pages using PHP tags**

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B.Sc. COMPUTER SCIENCE

CORE VII - OPERATING SYSTEMS WITH UNIX

COURSE CODE: 14UCSC320 14UCSC320P	**YEAR/SEMESTER: II/IV**	**MAX MARKS: 100**	**Theory :60 marks** **Practical :40 marks**
COURSE TYPE: THEORY & PRACTICAL	**CREDITS: 4**	**TOTAL TEACHING HOURS: 60**	**Theory :36 Hrs** **Practical : 24 Hrs**

COURSE OBJECTIVES:

- To have an Overview of Different Types of Operating Systems
- To know the components of an operating system.
- To have a thorough knowledge of process management
- To have a thorough knowledge of storage management
- To know the concepts of I/O and file systems.

UNIT I

Introduction

Types of System- OS Structure - Components - Services - System Structure - Layered Approach - Virtual Machines - System Design and Implementation. Process Management: Process - Process Scheduling - Cooperating Process - Threads - Inter-process Communication. CPU Scheduling: CPU Schedulers - Scheduling Criteria - Scheduling Algorithms– Views – Goals (7 Hrs)

UNIT II

Process Synchronization

Critical-Section Problem - Synchronization Hardware - Semaphores Classical Problems of Synchronization - Critical Region - Monitors. Deadlocks: Characterization- Methods for Handling Deadlocks - Deadlock Prevention - Avoidance - Detection - Recovery. (8 Hrs)

UNIT III

Memory Management

Address Binding - Dynamic Loading and Linking - Overlays - Logical and Physical Address Space - Contiguous Allocation - Internal & External Fragmentation. Non-Contiguous Allocation: Paging and Segmentation Schemes - Implementation - Hardware-Protection - Sharing - Fragmentation. (8 Hrs)

UNIT IV

Virtual Memory

Demand Paging - Page Replacement - Page Replacement Algorithms - Thrashing. File System: File Concepts - Access Methods - Directory Structures - Protection Consistency Semantics - File System Structures - Allocation Methods - Free Space Management.

(8 Hrs)

UNIT V

I/O System

Overview - I/O Hardware - Application I/O Interface - Kernel I/O Subsystem - Transforming I/O Requests to Hardware Operations - Performance. Secondary Storage Structures: Protection - Goals - Domain - Access matrix - The Security Problem - Authentication - Threats - Threat Monitoring - Encryption. Unix-introduction-different types of files-General purpose utilities-file systems-ordinary files-shell- VI editor-File attributes – Implementation of UNIX commands. (8 Hrs)

TEXT BOOKS:

- Silberschatz P.B.Galvin, Gange(2011), Operating System Concepts, Eighth edition, Addison-Wesley Publishing Co.
- Sumitabha Das (2008) ,Unix Concepts and Applications, Eighth reprint ,TMH publishing Company Limited.

REFERENCE BOOKS:

- H.M.Deitel(2007), An Introduction to Operating Systems, Second Edition, Addison Wesley.
- A.S.Godbole(2011) ,Operating systems, Third Edition, TMH publishing Company Limited.

ACTIVITY PLANNER

List of activities for Employability / Skill Development / Entrepreneurship Skill Development
(Course faculty may conduct any, all or any other activities as well)

- **Open Source Pundits:** Exercise problems using Bash and Bourne Script . Exercise on Awk script programming.
- **Assignment** :Problems - Converting Logical Address to Physical Address.
- Problems to find the number of Page fault for a given instance of pages using different page replacement Algorithms
- **Hands-on-Session Lab Exercise:** Creating student Database and Inventory Database using vi editor and accessing it using Shell or Awk script.

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UNIX –PRACTICAL
LIST OF PROGRAMS (24 Hrs)

1. UNIX
   - General purpose utilities
   - File systems
   - Shell programming-simple programs, control structures, functions.
   - VI editor
   - Filters
   - Grep family
   - Process
   - Communication
   - Awk

2. Implementing process scheduling algorithms in C
   - Round robin policy
   - Priority based scheduling

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B.Sc. COMPUTER SCIENCE

ALLIED IV - RESOURCE MANAGEMENT TECHNIQUES
COMMON TO B.Sc. COMPUTER SCIENCE & B.C.A.

COURSE CODE: 14UMAT329	**YEAR/SEMESTER: II/IV**	**MAX MARKS: 100**
COURSE TYPE: THEORY	**CREDITS: 5**	**TOTAL TEACHING HOURS: 75**

COURSE OBJECTIVES:

- To understand the major capabilities and limitations of deterministic operations research modeling as applied to problems in industry or government
- To be able to recognize, formulate and, using prepared computer packages, solve allocation models of static or dynamic type.

UNIT I
Basics of Operations Research

Characteristics of OR- OR and Decision Making- Linear programming- formulations and Graphical solution canonical and standard terms of Linear programming problem- Algebraic solution – simplex method – Charnes method of penalties- Concept of duality- properties of duality– Application areas of Operations Research. (15 Hrs)

UNIT II
Transportation model

Definition- formulation and solution of transportation models- NWCR, LCM and Vogel's approximation method- Assignment model: Definition of Assignment model- formulation- Hungarian method– Difference between Transportation and Assignment model.

(15 Hrs)

UNIT III
Sequencing Problems

Processing each of n jobs through m machines- processing n jobs through 2 machines- processing n jobs through 3 machines- processing n jobs through m machines- processing 2 jobs through m machines (Graphical method)- traveling salesman problem. (15 Hrs)

UNIT IV
Game Theory & Simulation

Characteristics of games- Maximin, Minimax criteria of optimality- Dominance property- algebraic and graphical method of solution of solving 2x2 games. Simulation: Definition- Limitation- Various methods of obtaining random numbers (additive, multiplicative and mixed types of congruence random number generators) (15 Hrs)

UNIT V
Networks

Networks-Fulkerson's rule- PERT computation and CPM computation. (15 Hrs)

TEXT BOOKS:

- Prem Kumar Gupta and D.S. Hira(2007), Operations Research, Sixth Edition, S. Chand and Comp Ltd.
- Dr. P.R. Vittal (2008), Introduction to Operations Research, Margham Publications.

REFERENCE BOOKS:

- Sundaresan Ganapathy, Resource Management Techniques, AR Publications.
- Hamdy A Taha (2011), Operations Research, Ninth Edition, Prentice Hall of India.

ACTIVITY PLANNER

List of activities for Employability / Skill Development / Entrepreneurship Skill Development
(Course faculty may conduct any, all or any other activities as well)

Simulate to Stimulate – A key for successful strategy as it provides knowledge from planning to execution.

Glossary of Terms – The set of important terms to be remembered for solving the problems. Serves as a dictionary for reference throughout their course.

Relearn at Your Own Pace – Solve one new problem under each topic to reinforce the concepts learnt in class and motivate students to explore more.

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DEPARTMENT OF COMPUTER SCIENCE

ELECTIVE II -INTERDISCIPLINARY ELECTIVE
WEB DESIGN USING OPEN SOURCE TECHNOLOGY

COURSE CODE: 11UELE302R	YEAR/SEMESTER: II/IV	MAXIMUM MARKS: 100
COURSE TYPE: PRACTICAL	CREDITS: 5	TOTAL TEACHING HOURS: 75

COURSE OBJECTIVES:

- To create and design websites using GUI based Open Source Software, an alternate open source tool for Macromedia Dreamweaver.

UNIT – I

Open Source Technology-Introduction –Difference between GUI based Open Source Software and HTML Editors -Creating Web Pages Using GUI based Open Source Software - Formatting Paragraphs, Headings, And Lists

UNIT– II

Adding images to your web page-Working with table of contents on your web page-working with templates-updating or removing table of contents-Working with templates-Setting page properties-meta tags-colors and background

UNIT – III

Adding tables to your web page-inserting table- changing a tables's properties-Adding deleting rows, columns and cells-Changing the default table editing behaviour-selecting table elements-Moving, copying and deleting tables-converting text into a table

UNIT – IV

Creating Links-Creating links within same page-Creating links to other pages-Adding XFN information within your links-using images as links-removing or discontinuing links-Publishing your web pages

UNIT – V

Casading Stylesheets-Using inline styles-internal stylesheet- external stylesheet-Creating Stylesheet with Firefox-Creating rules for stylesheet

LIST OF PROGRAMS

1. Create a webpage to show the usage of various formatting tags.
2. Create a webpage to display the usage of Nested Ordered / Unordered List. Use
3. Create a webpage to illustrate the usage of images and hyperlinks.
4. Create a webpage to show the navigation within a page.
5. Create a time table using row and column span.
6. Create a webpage to illustrate frame targeting.

7. Create a webpage to illustrate nested frames.
8. Create a webpage to show the usage of inline frames.
9. Create a webpage to demonstrate horizontal and vertical frame.
10. Create a webpage to show the image as hyperlink.
11. Create an Employee form to accept employee personal details (Use all form elements)
12. Create a table with the cells having
    - Image
    - Formatted text
    - List
    - Hyperlink
13. Create a webpage to demonstrate the usage of Internal/inline styles
14. Create a webpage to demonstrate the usage of External style sheet

ACTIVITY PLANNER

List of activities for Employability / Skill Development / Entrepreneurship Skill Development
(Course faculty may conduct any, all or any other activities as well)

- **Group Discussions**-About the companies whose web presence improved by elegant websites and teaches them to listen and respect everyone's viewpoint and drive them industry ready
- Incubator-Activity to share business ideas for website startup companies
- CodeFix-Debugging activity which will improve technical proficiency and collaborative learning

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Choice Based Credit System
Course of Study for the batch of Candidates admitted in 2014 – 2015

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B.Sc. COMPUTER SCIENCE

CORE VIII - PROGRAMMING IN JAVA
(COMMON TO B.Sc. COMPUTER SCIENCE & B.C.A.)

COURSE CODE: 14UCSC330 &14UCSC330P	**YEAR/SEMESTER: III/V**	**MAX MARKS: 100**	**Theory :60 marks** **Practical :40 marks**
COURSE TYPE: THEORY & PRACTICAL	**CREDITS: 4**	**TOTAL TEACHING HOURS: 60**	**Theory :36 Hrs** **Practical : 24 Hrs**

COURSE OBJECTIVES:

- To understand the concepts of Object Oriented Programming
- To become proficient programmers through the java programming language
- To understand the various classes and methods in Java.

UNIT I
Introduction to Java-Features of Java-Object Oriented Concepts-Lexical Issues-Data Types – Variables – Arrays – Operators - Control Statements – Classes – Objects – Constructors - Overloading method - Access control - static and fixed methods - Inner classes -Inheritance-Overriding methods-Using super-Abstract class.
(The Complete Reference Java 2 – Chapter 1,2,3,4,5,6,7,8)

UNIT II
Packages-Access Protection-Importing Packages-Interfaces-Exception Handling-Throw and Throws-Thread-Synchronization-Messaging-Runnable Interface-Inter thread communication-Deadlock-suspending, resuming and stopping threads-Multithreading.
(The Complete Reference Java 2 – Chapter 9,10,11)

UNIT III
I/O Streams-File Streams-String Objects-String Buffer-Char Array-Java Utilities-Collections interface-Collection classes-Enumeration –Vector -Stack –Hashtables - String class
(The Complete Reference Java 2 – Chapter 12(pg.no 313-331),ch: 13, ch:15 (pg.no 439-457, 484-497))

UNIT IV
Working with windows using AWT Classes - Class Hierarchy of Window and Panel - AWT controls - Layout Managers – Menus- Menubars - Dialog Boxes- File Dialog-Applets-Life cycle of Applet-Types of Applets-Event handling- -Applet tags
(The Complete Reference Java 2 – Chapter 19, 20, 21(pg. no 687-712), ch: 22(pg. no. 735-790)

UNIT V

JDBC Objects: The concept of JDBC- JDBC driver types- JDBC Packages- Overveiw of JDBC process-Database Connection-Statement Objects-Resultset –Java Servlets: Java servlets and CGI programming – A simple java servlet- Anatomy of java servlet- Reading data from a client –Reading HTTP request and reponse header.

(The Complete Reference J2EE –chapter 6, 10pg.no(347-364)

TEXT BOOKS:

- P.Naughton and H.Schildt –Java 2 (The Complete Reference) –Third Edition
- Jim Keogh – The Complete Reference J2EE – Tata McGraw Hill Edition 2002.

REFERENCE BOOKS:

- Cay S. Horstmann, Gary Cornell – Core Java 2 Volume I –Fundamentals-Addision Wesley
- K.Arnold and J.Gosling –The Java Programming Language-Second Edition

ACTIVITY PLANNER

List of activities for Employability / Skill Development / Entrepreneurship Skill Development
(Course faculty may conduct any, all or any other activities as well)

Code mapping: To understand core java concepts and implementation done with IDE

Team based Project: Team based Project: Projects based on Applets were implemented for real time applications

Quality checking Tasks: Tests were conducted on core concepts for developing Self learning skills

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PROGRAMMING IN JAVA - PRACTICAL

LIST OF PROGRAMS

APPLICATION

1. Program to illustrate i) constructors ii) inheritance iii) overloading and overriding
2. Implementation of Packages, interfaces, Exception handling
3. Implementation of concurrent and synchronized threads.
4. Implementation of string and string buffer classes and methods.
5. Implementation of stack and vector.
6. Implementation of file read and write operation.

APPLET PROGRAMS

7. Working with Frames and various controls
8. Working with Dialogs and Menus
9. Working Panel and Layout
10. Incorporating Graphics
11. Working with applets
12. Working with Images

DATABASE CONNECTIVITY

13. Application using jdbc connectivity.

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B.Sc. COMPUTER SCIENCE

CORE IX - WEB TECHNOLOGY
COMMON TO B.Sc. COMPUTER SCIENCE & B.C.A

COURSE CODE: 14UCSC332 & 14UCSC332P	**YEAR/SEMESTER: III/V**	**MAX MARKS: 100**	**Theory :60 marks** **Practical :40 marks**
COURSE TYPE: THEORY & PRACTICAL	**CREDITS: 4**	**TOTAL TEACHING HOURS: 60**	**Theory :36 Hrs** **Practical : 24 Hrs**

COURSE OBJECTIVES:

- To understand the use of style sheets in HTML.
- To use javascript in the HTML document.
- To understand the server based concepts and scripting with ASP.NET.
- To program for the web.

UNIT I

Internet Basic – Introduction to HTML – List – Creating Table – Linking document – Frames – Forms and Form Controls – Graphics to HTML Doc – Style sheet basic – Adding style to document – Creating Style sheet rules – Style sheet rules – Style sheet properties – Font – Text – List – Color and background color – Box and Display properties.

Independent study Html Tags, style sheets

UNIT II

Introduction to JavaScript – Advantage of JavaScript – JavaScript syntax – Data type – Variable – Array – Operator and Expression – Looping Constructor – Function.

Independent study : Advantage of javascript

UNIT III

JavaScript Document Object Model – Introduction – Object in HTML – Event Handling – Window object – Document Object – Browser Object – Form Object.

Independent study Form Objects

UNIT IV

ASP.Net Language Structure – Page Structure – Page event, properties and Compiler Directives. HTML Server Controls – Anchor, Tables, Forms. Basic Web Server Controls – Labels, Textbox, Button, Image, Links, Check & Radio button lists, Drop down list, Data Repeater.

Independent study Compiler directives

UNIT V

Validator Controls - Datagrid control – Working with data – OLEDBConnection class, command class, transaction class, data adapter class, and data set class – Cookies – Application Issues – Error Handling.

Independent study **Cookies and application issues**

TEXT BOOKS:

- T.A.Powell(2010), *HTML and CSS , The Complete Reference*,TMH
- James Jaworski and Jamie Jaworski, (2001) *Mastering Javascript* ,BPB Publications.
- Greg Buczek(2002) *ASP.NET Developers Guide*,Tata McGraw Hill .

REFERENCE BOOK:

- Hersh Bhasin(2002),*Microsoft ASP.NET Professional Projects*, Prentice Hall of India Pvt .Ltd.

ACTIVITY PLANNER

List of activities for Employability / Skill Development / Entrepreneurship Skill Development
(Course faculty may conduct any, all or any other activities as well)

- **Group Discussions**-About the companies whose web presence improved by the adoption of ASP.NET technology and teaches them to listen and respect everyone's viewpoint and drive them industry ready
- **Incubate**-Activity to share business ideas for website startup companies
- CodeFix-Debugging activity which will improve technical proficiency and collaborative learning

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WEB TECHNOLOGY-PRACTICAL
LIST OF PROGRAMS

- Create a home page for your college. Make use of images and hyperlinks.
- Create a web page to display your bio data. Make use of tables (with rowspan and colspan) wherever necessary.
- Create a web page to categorize the subjects you learnt in your UG semester wise with the help of bullets and numbering.
- Create a web page to display your personal diary which contains yours friends names, address and e-mail id. (with the link to the email address). Display the heading as PERSONAL DIARY. Make use of horizontal rulers.
- Write a script to create an array of list of courses offered in your college and display them.
- Write a function in Javascript that takes a string and display the number of vowels and consonants in that string.
- Create a simple calculator using form fields.
- Create a home page that has links to two different files that has details about your personal information and academic information. The user should not click the link to move to the pages. The page should be loaded on mouse over itself.
- Create a home page that displays an advertisement html file in a new window without address bar, tool bar and status bar. This window should unload after 30 seconds.
- Display an mobile advertisement at the bottom of the web form which contains purchase details
- Create an array containing the titles of five new movies. Use this array as a data source for a drop down list and display the selected movie title to the user when the user clicks submit button.
- Create a Web form using ASP.NET Controls for student information system.
- Create a web form that accepts input using the calendar control.
- Create a web form that makes use of the validation controls.
- Create an Online Library Transaction Web form using ASP.NET Controls.

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(Effective for the batch of Candidates admitted in 2014 - 2015)

B.Sc. COMPUTER SCIENCE

CORE X - DATA MINING
COMMON TO B.Sc. COMPUTER SCIENCE & BCA

COURSE CODE: 14UCSC326	**YEAR/SEMESTER: III/V**	**MAX MARKS: 100**
COURSE TYPE: THEORY	**CREDITS: 4**	**TOTAL TEACHING HOURS: 60**

COURSE OBJECTIVES:

- To understand the concept of Data Mining
- To understand various Data mining tasks & techniques
- To discuss the applications of Data mining in various fields

UNIT I

Data Mining: Introduction: What is Data Mining ? –Motivating Challenges – Origins of Data Mining – Data Warehousing - Data Mining tasks.
Data: Types of Data – Data Quality – Data Preprocessing .
Independent Study: Application areas of Data Mining

UNIT II

Classification: Introduction – Decision Tree Construction Algorithms – Id3 – Cart– Pruning – Bayesian Classification – Rule Based Classification – K-Nearest Neighbor Classification.
Independent Study: Constructing Decision Tree for real time data

UNIT III

Association Rule Mining: Introduction – Automatic discovery of Association Rules in Transaction databases – Apriori algorithm – Shortcomings – FP Growth algorithm
Independent Study: Deriving association rules for transaction data examples

UNIT IV

Cluster Analysis : Introduction – Partitional Clusterings – K- Means - k-Medoids – Modern Clustering Methods – BIRCH– DBSCAN – CHAMELEON.
Independent Study: Modern Clustering Methods

UNIT V

Text Mining, Web Mining, Spatial Data Mining, Multimedia Mining. Applications of Data Mining in Banking industry & Healthcare – Role of Data Mining in WEKA.
Independent Study: Applications of Data Mining in Banking industry & Healthcare

TEXT BOOKS:

- Jiawei Han, Micheline Kamber (2011),*Data Mining Concepts and Techniques* ,Morgan Kauffman Publishers
- Pang Ning Tan,Michael Steinbach ,Vipin Kumar (2005), *Introduction to Data Mining,* Addison Wesley
- K.P.Soman, Shyam Diwakar, V.Ajay(2006) *Insight into Data Mining: Theory & Practice* Prentice Hall of India
- *Data Mining* (2004) , BPB publications ,BPB Editorial Board

REFERENCE BOOK:

- Ian H.Witten & Eibe Frank(2011) *Data Mining , Practical Machine Learning Tools and Techniques,* Morgan Kaufmann series.

ACTIVITY PLANNER

List of activities for Employability / Skill Development / Entrepreneurship Skill Development
(Course faculty may conduct any, all or any other activities as well)

- **White papers**-Analysis of white papers on Data mining help the students about the best practices in data mining industry and improves the employment opportunities.
- **Group Discussion**-Presents the students with business ideas for analytics start ups

- Student Seminar**-Improves the presentation skills,self awareness skills and ability to use multimedia**

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B.Sc. COMPUTER SCIENCE

CORE XI - DESIGN AND ANALYSIS OF ALGORITHMS

COURSE CODE: 14UCSC327	**YEAR/SEMESTER: III/V**	**MAX MARKS: 100**
COURSE TYPE: THEORY	**CREDITS: 4**	**TOTAL TEACHING HOURS: 60**

COURSE OBJECTIVES:

- To become familiar with the analytical skills of programming languages in general
- To enhancing the problem solving skills and thinking skills
- To write efficient algorithms

UNIT I
Introduction-Design of Algorithm – Pseudocode conventions – Recursive Algorithms – Time and Space Complexity – Big-O Notation.
Independent study – Implementation of Recursive algorithm

UNIT II
Divide and Conquer – General Method - Finding maximum and minimum – Merge sort – Quick Sort - Selection Sort
Independent study - Merge sort
.

UNIT III
Greedy Method : Knapsack problem – Tree Vertex splitting – Job Sequencing with deadlines – Optimal storage on tapes.
Independent study - Optimal storage on tapes

UNIT IV
Dynamic Programming : General method – Multistage graph – All pairs shortest path – Single source shortest path – Search Techniques for Graphs – BFS- DFS – Connected Components – Bi-Connected Components and DFS
Independent study - Search Techniques for Graphs

UNIT V
Backtracking: General Method – 8-Queen's – Sum of Subsets – Graph Colouring – Hamiltonian cycles – Branch and Bound: General Method – Travelling Sales person problem
Independent study - Travelling Sales person problem

TEXT BOOK:

- Ellis Horowitz and Sartaj Sahni (2010),*Fundamentals of Computer Algorithms*,Galgotia Publications Pvt., Ltd.

REFERENCE BOOKS:

- Ellis Horowitz and Sartaj Sahni, Sanguthevar Raja sekaran,(2010) ,*Fundamentals of Computer Algorithms*, Galgotia Publications Pvt.Ltd.
- Sara Baase Allen, Van Gelder (2001),*Computer Algorithms- Introduction to Design and Analysis*, AddisonWesley
- Thomas H Corman, Charles E. Leiserson, Ronald L.Rivest and Clifford Steuin (2003) *Introduction to Algorithms*, PHI

ACTIVITY PLANNER

List of activities for Employability / Skill Development / Entrepreneurship Skill Development
(Course faculty may conduct any, all or any other activities as well)

- **Algorithm Unlock**: Students to choose one problem from any algorithm design method and implement it in any know programming language except python, execute it for the given input.
- **Python Byte :** Develop an Application in python implementing all python concept learnt . Build an Interactive Quiz using python.
- **Problem Parser** : Exercise Problems on Quick sort, Merge sort and Knapsack problem, Graph colouring , Hamiltonian cycle and Generating Biconnected Component.

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B.Sc. COMPUTER SCIENCE

CORE XV – CLOUD COMPUTING
COMMON TO B.Sc. COMPUTER SCIENCE & B.C.A.

COURSE CODE: 14UCSC325	**YEAR /SEMESTER:** III/V	**MAXIMUM MARKS: 100**
COURSE TYPE: THEORY	**CREDITS:** 4	**TOTAL TEACHING HOURS:** 60

COURSE OBJECTIVES:

- Learn basic concepts of Cloud Computing.
- To get an overview of MapReduce Concepts.
- To learn about infrastructure security, Data Security and Privacy.

UNIT I

Introduction to Cloud Computing

Cloud Computing – Definition – SPI Framework – Software Model – Cloud Services Delivery Model – Deployment Models – Key drivers – Impact on Users – Governance in the cloud – Barriers to Cloud Computing Adoption in the enterprise. Examples of Cloud Service Providers: Amazon Web services – Google – Microsoft Azure Services Platform – Sun Open Cloud Platform. (15 Hrs)

UNIT II

Virtual Machines Provisioning and Migration Services

Introduction and Inspiration -Background and Related Work-Virtual Machines Provisioning and Manageability-Virtual Machine Migration Services-VM Provisioning and Migration in Action -Provisioning in the Cloud Context -Future Research Directions- The Anatomy of Cloud Infrastructures -Distributed Management of Virtual Infrastructures- Scheduling Techniques for Advance Reservation of Capacity- Capacity Management to meet SLA Commitments . (15 Hrs)

UNIT III

MapReduce Programming & Infrastructure Security

Introduction - MapReduce Programming Model -Major MapReduce Implementations for the Cloud- MapReduce Impacts and Research Directions. Infrastructure Security: The Network Level -Infrastructure Security: The Host Level -Infrastructure Security: The Application Level. (10 Hrs)

UNIT IV

Data Security, Identity and Access Management

Data security and storage: Aspects of Data Security -Data Security Mitigation -Provider Data and Its Security. IDENTITY AND ACCESS MANAGEMENT:Trust Boundaries and IAM -Why IAM? -IAM Challenges-IAM Definitions-IAM Architecture and Practice-Getting Ready for the Cloud -Relevant IAM Standards and Protocols for Cloud Services -IAM Practices in the Cloud-Cloud Authorization Management-Cloud Service Provider IAM Practice. (10 Hrs)

UNIT V

Security and privacy

Security Management: Standards – Security Management in the Cloud – Availability Management – Access Control.Privacy: What is Privacy – Data Life Cycle – Key Privacy Concerns – Who is responsible for protecting Privacy – Privacy Risk Management – Legal and Regulatory Implications. (10 Hrs)

TEXT BOOKS:

- Tim Mather , Subra Kumaraswamy , Shahed Latif (2010), Cloud Security and Privacy, OREILLY Media.
- Rajkumar Buyya, James Broberg, Andrzej Goscinski(2011),CLOUD COMPUTING Principles and Paradigms, John Wiley & Sons, Inc., Hoboken, New Jersey.

REFERENCE BOOK:

- Ronald L. Krutz and Russell Dean Vines(2010), *Cloud Security*, Wiley – India.

ACTIVITY PLANNER

List of activities for Employability / Skill Development / Entrepreneurship Skill Development
(Course faculty may conduct any, all or any other activities as well)

- **CloudCrowd**:Explore the various services offered by AWS, Google, Microsoft Azure . Prepare a table with the name coined for each service by different cloud service providers.
- **Group Discussion:** Skills required for cloud architects and various Cloud Computing Job Roles
- **Google form** to create & grade MCQs -Cloud Scheduling Algorithms
- **Seminar**:Cloud Security and Privacy (Content to be taken by watching YouTube Videos on Cloud Security and Privacy

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B.Sc. COMPUTER SCIENCE

CORE XIII - PROJECT

COURSE CODE: 14UMIP301	YEAR/SEMESTER: III/VI	MAX MARKS: 100
	CREDITS: 4	

COURSE OBJECTIVE:

- This course gives Practical training in design and implementation of a single mini problem.

COURSE OUTLINE:

Each student will develop and implement individual application software based on the latest technologies**.**

- Strive training-Identifying and building the correct specification for the project to be built
- Commission king-Discussions about how effectively the project can be of use in the industry and feasibility of use of the project
- Practice to perfect- building projects by connecting to the backend and performing rigorous testing to build a flawless product

ACTIVITY PLANNER

List of activities for Employability / Skill Development / Entrepreneurship Skill Development

(Course faculty may conduct any, all or any other activities as well)

Develop analytical, communication, presentation skills for conduct of full time research

Strive training: Identifying and building the correct specification

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B.Sc. COMPUTER SCIENCE

CORE XIV - COMPUTER NETWORKS

COURSE CODE: 14UCSC334	**YEAR/SEMESTER: III/VI**	**MAX MARKS: 100**
COURSE TYPE: THEORY	**CREDITS: 4**	**TOTAL TEACHING HOURS: 60**

COURSE OBJECTIVES:

- To introduce the fundamental network architecture concepts and their core principle issues in the emerging communication / data networks.
- To have a complete picture of the data and computer networks systematically
- To design and implement communication network
- To provide a strong foundation in networking concepts and technology.

UNIT I

Introduction – Network Hardware – Software – Reference Models – Internet – ATM – Physical layer – Transmission media – wireless transmission – switching (circuit switching, packet switching, Hybrid switching) methods – communication Satellites.

Independent study - Communication Satellites.

UNIT II

Data link layer Design issues – error detection and correction – elementary data link protocol sliding window protocols – Data Link Layer in the Internet.

Independent study - Data Link Layer in the Internet

UNIT III

Medium Access Layer – Channel Allocation problem – Multiple Access Protocols – Ethernet Wireless LANs – Bluetooth.

Independent study - Bluetooth.

UNIT IV

Network Layer – design issues – Routing algorithms – Congestion control algorithms – quality of service-Internet working – IP protocol – IP Address – Internet Control Protocol.

Independent study - Quality of service

UNIT V

Transport Layer – Transport service-Elements of Transport protocols– Simple Transport Protocol – Internet Transport Protocol (TCP). Application layer -Domain Name systems - Electronic mail. Network security-cryptography.

Independent study - Domain Name systems

TEXT BOOK:

- Andrew S.Tanenbaum (2011) , *Computer networks* , Pearson Education, fifth edition

REFERENCES:

- Behrouz Forouzan(2009), *Introduction to Data Communications in Networking*, TMH, fourth edition
- Fred Halsall(1996), *Data Communications Computer Networks and Open Systems*, Addison Wesley, fourth edition

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ACTIVITY PLANNER

List of activities for Employability / Skill Development / Entrepreneurship Skill Development
(Course faculty may conduct any, all or any other activities as well)

- **Clickers**: "Problems in error detection and correction" Students to solve the problems and give answers individually. Then the problem is discussed in the open classroom after which students need to check for correctness of their solution and change it accordingly.
- **Analysis by comparison** :" OSI and TCP/IP Models" – The two network models to be compared in all aspects and the analysis report to be submitted as assignment.

- **Network Crossword**: Complete the cross word puzzle with ACROSS and DOWN clues to find out Networking related Terminology.

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B.Sc. COMPUTER SCIENCE

CORE XV - OBJECT ORIENTED SOFTWARE ENGINEERING

COURSE CODE: 14UCSC337 &14UCSC337P	**YEAR/SEMESTER: III/VI**	**MAX MARKS: 100**	**Theory :60 marks** **Practical :40 marks**
COURSE TYPE: THEORY & PRACTICAL	**CREDITS: 4**	**TOTAL TEACHING HOURS: 60**	**Theory :36 Hrs** **Practical : 24 Hrs**

COURSE OBJECTIVES:

- To develop programming systems using object-oriented analysis and design techniques
- To model software using the UML modeling system
- To understand basic debugging and testing procedures for software.

UNIT I

Introduction to Objects- Module- Cohesion- Coupling – Data Encapsulation- Abstract Data types- Information hiding- Objects- inheritance- polymorphism and Dynamic Binding- Cohesion and coupling of objects- Reusability, Portability and Interoperability- Reuse concepts- Impediments to reuse- Reuse Case studies- Objects and Productivity- Reuse during Design and Implementation phases- Reuse and maintenance- Portability- Why portability- Techniques for achieving portability- Future trends in Interoperability
Independent study – Reuse Case studies

UNIT II

Planning and Estimation- Planning and the software Process- Estimating Duration and Cost- components of Software Project management plan- IEEE software project management Plan-Planning of Testing- Planning of Object Oriented Projects- Training Requirements- Documentation Standards- Case Tools for Planning and Estimating- Testing the Software Project Management Plan Requirements Phase- requirements analysis techniques- Rapid Prototyping- Human factors- rapid prototyping as a specification technique- reusing the rapid prototyping- other uses of rapid prototyping- management implication of the Application design- Testing during the requirements phase- Case tools for the requirements phase- metrics for the requirements phase- Case Study.
Independent study – Rapid prototyping as a specification technique, metrics for the requirements phase, case study.

UNIT III

Specification phase- specification document- informal- specification – structured systems analysis- other semi formal techniques- entity relationship modeling- testing during

specification phase- case tools for specification phase- metrics for specification phase- challenges of the specification phase- object oriented analysis – Elevator problem- Use case modeling-Class modeling- Dynamic modeling- Testing during the object oriented analysis phase- case tools and challenges of object oriented analysis phase

Independent study – challenges of object oriented analysis phase

UNIT IV

Design Phase- design and abstraction- Action oriented design- data flow analysis- transaction analysis- data oriented design- object oriented design- Elevator problem- Formal techniques for detail designs- real time design techniques- testing – case tools- metrics- object oriented design- Implementation Phase:- Choice of programming language- fourth generation language- good programming practice- coding standards- module reuse- module test case selection- black box, glass box module testing techniques- comparison – clean room- potential problems when testing objects- management aspects of module testing- case tools.

Independent study – Different types of testing- difference between the same

UNIT V

Implementation and integration phase- testing- graphical user interfaces- product testing- acceptance testing – case tools for this phase- integration environments for business applications- public tools infrastructure- potential problems with environments maintenance phase- Why maintenance is necessary- case study- Maintenance of Object oriented software-maintenance versus development skills-reverse engineering- testing during maintenance- case tools.

Independent study – Reverse engineering, maintenance case study

TEXT BOOK:

- Stephan R.Schach(2011), *Object Oriented and Classical Software Engineering* , Mc.Graw Hill, Eighth Edition

REFERENCE BOOK:

- Matt Weisfield(2008), *The object oriented thought process*,Pearson Publication,Third edition

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List of activities for Employability / Skill Development / Entrepreneurship Skill Development
(Course faculty may conduct any, all or any other activities as well)

Business requirements-Building the right requirements for a product enhances the knowledge in building good object oriented software

Content cluster-group activity which enables students to build a product from requirement to testing, which enhances their development skills

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UNIFIED MODELING LANGUAGE - PRACTICAL

1. Application using Use cases
2. Application using Sequence diagram
3. Application using Collaboration diagram
4. Application using Class Diagram
5. Application to show the working with attributes
6. Application using State Transition Diagram
7. Application using Deployment View

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DEPARTMENT OF COMPUTER SCIENCE
NON MAJOR ELECTIVE - PUBLISHING SOFTWARE I

COURSE CODE: 10UNME 411A	**YEAR/SEMESTER:** III/VI	**MAXIMUM MARKS:** 100+100
COURSE TYPE: PRACTICAL	**CREDITS:2**	**TOTAL TEACHING HOURS:30**

COURSE OBJECTIVES:

To familiarize with the publishing software application

To give hands-on-experience in the publication domain.

UNIT – I

Introduction into Microsoft Publisher - Starting Up Microsoft Publisher.

UNIT – II

Creating a publication with a wizard - Quick Publication Wizard with a blank publication.

UNIT – III

Create a new publication based on a template - Start a publication from scratch.

WEBSITES:

http://microsoft.com/office/publisher/default.htm

ACTIVITY PLANNER

List of activities for Employability / Skill Development / Entrepreneurship Skill Development
(Course faculty may conduct any, all or any other activities as well)

EM: Practical exposure: Hands on training for model based Customized publication to enhance creative skills.

SD: Printing publication: Advertisement model based publication to be designed for skill based development

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NON MAJOR ELECTIVE - PUBLISHING SOFTWARE II

UNIT – I

Open an existing publication - Pack your publication to take to another computer.

UNIT – II

Set up a publication for black and white commercial printing

WEBSITES:

http://microsoft.com/office/publisher/default.htm

ACTIVITY PLANNER

List of activities for Employability / Skill Development / Entrepreneurship Skill Development
(Course faculty may conduct any, all or any other activities as well)

EM:Print based Projects: Requirement based projects provided by the organisation in a team enhances creative skills

SD: Skill Check: Blueprints were developed for new patterns and designs