

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086

MASTER OF SCIENCE (INFORMATION TECHNOLOGY)

SYLLABUS

(Effective from the academic year 2015 - 16)

ALGORITHMS AND DATA STRUCTURES

CODE: 15CS/PC/AD14

CREDITS: 4

L T P: 4 1 0

TOTAL TEACHING HOURS: 65

OBJECTIVES OF THE COURSE

- To understand the design of algorithms and analysis techniques
- To enable the students to analyse the time and space complexity of algorithms
- To have a good understanding on different data structures
- To understand the kinds of problems that uses the data structures and the algorithms for solving them

Unit 1 (13 hrs.)

Introduction to Algorithms

1.1 Basic Concepts

Basic steps in complete development of Algorithm - Analysis and complexity of Algorithm – Asymptotic notations - Problem Solving techniques and examples

1.2 ADT

List ADT, Stacks ADT, Queue ADT

Unit 2 (16 hrs.)

2.1 Algorithm Design Model

Greedy Method - Divide and Conquer - Dynamic Programming – Backtracking – Branch and Bound

2.2 Trees

Preliminaries Binary Tree, Search Tree ADT, Binary Search Trees, AVL Trees, Tree Traversals, B-Trees

Unit 3 (13 hrs.)

3.1 Hashing

General Idea, Hash Function, Separate Chaining, Open Addressing, Rehashing, Extendible Hashing, Priority Queues, Model, Simple Implementations, Binary Heap, Applications

Unit 4 (11 hrs.)

4.1 Sorting

Sorting - Preliminaries, Insertion Sort, Shell Sort, Heap Sort, Merge Sort, Quick Sort, External Sorting

Unit 5

(12 hrs.)

5.1 Graphs

Definitions, Topological Sort, Shortest Path Algorithm, Minimum Spanning Tree,
Application of Depth First Search

5.2 Theory of NP-Completeness

Formal language framework, Complexity classes – P, NP - NP Reducibility and
NP-Complete, NP-Hard

TEXT BOOKS

Aho, J. E. Hopcroft and J. D. Ullman. *Design and Analysis of Computer Algorithms*. 1st ed.
Addison-Wesley, 2009.

Horowitz and Sahani. *Fundamentals of Computer Algorithms*. 2nd ed. Galgotia, 2008.

Weiss, M. A. *Data Structure and Algorithm analysis in C*. 2nd ed. Pearson Education Asia,
2002.

BOOKS FOR REFERENCE

Baase, S. and Allen Van Gelder. *Computer Algorithms-Introduction to Design and Analysis*.
New Delhi: Pearson Education, 2008

Goodrich, M.T. and R. Tamassia. *Algorithm Design: Foundations, Analysis, and Internet
Examples*. New Delhi: Wiley, 2006.

PATTERN OF EVALUATION

Continuous Assessment:

Total Marks: 50

Duration: 90 mins.

Section A - $5 \times 2 = 10$ marks (Answer all the questions)

Section B - $4 \times 5 = 20$ marks (4 out of 5)

Section C - $2 \times 10 = 20$ marks (2 out of 3)

Third Component:

Seminars

Quiz

Open book tests

Group discussion

Assignments

Problem solving

Tracing algorithms

End Semester Examination:

Total Marks: 100

Duration: 3 hours

Section A - $10 \times 2 = 20$ marks (Answer all the questions)
(2 questions to be set from each unit)

Section B - $6 \times 5 = 30$ marks (6 out of 8)
(Atleast 1 question from each unit)

Section C - $5 \times 10 = 50$ marks (5 out of 7)
(Atleast 1 question from each unit)

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI - 600 086

MASTER OF SCIENCE (INFORMATION TECHNOLOGY)

SYLLABUS

(Effective from the academic year 2015 – 2016)

ADVANCED PROGRAMMING WITH C

CODE : 15CS/PC/AP14

CREDITS: 4

L T P: 2 1 3

TOTAL TEACHING HOURS: 78

OBJECTIVES OF THE COURSE

- To introduce the syntax, semantics and various features of C language
- To highlight the benefits of using pointers
- To help the students to write programs to implement data structures using C

Unit 1

Introduction (12 hrs.)

- 1.1 Basic Concepts of C Programming – Introduction, Constants, Variables and Keywords, Data Types
- 1.2 Control Structure – Decision, Loop, Case
- 1.3 Arrays – One-Dimensional

Unit 2

Functions and Pointers (16 hrs.)

- 2.1 Functions – Purpose, Passing Values, Scope Rule, Calling Convention - Call by Value, Call by Reference – Passing Arrays to Functions - Recursion and Stack
- 2.2 Pointers - The & and * Operators – Pointer Expressions – Terminologies – char, int and float pointers – Passing Addresses to Functions – Functions returning Pointers

Unit 3

Structures and Pointers (16 hrs.)

- 3.1 Structures - Introduction, Declaring, Accessing and Storing - Array of Structures - Additional features - Uses
- 3.2 Pointers and Structures – Structure, Pointers, Offsets of Structure elements
- 3.3 Dynamic Memory Allocation
malloc, calloc, realloc, free

Unit 4

4.1 Implementing Data Structures (22 hrs.)

- Singly Linked lists - Stack and Queues – Double linked Lists – Merging of Linked Lists – Sorting a Linked List – Circular Linked List – Trees – Binary Search Tree

- Unit 5** **(12 hrs.)**
- 5.1 Storage Classes in C**
Automatic – Register – Static - External
 - 5.2 Command Line Arguments**
argc, argv
 - 5.3 The C Preprocessor**
Features, Macro Expansion, File Inclusion, Conditional Compilation
 - 5.4 Files**
Data Organisation – File Operation – A File-Copy Program - File Opening Modes

Unit 4 – Only for Practicals

TEXT BOOKS

Kanetkar, Yashavant. *Let Us C*. 13th ed. India: BPB, 2006.

Kanetkar, Yashavant. *Understanding Pointers in C*. 4th ed. India: BPB, 2003.

BOOKS FOR REFERENCE

Balagurusamy, E. *Data Structures Using C*. New Delhi: 1st ed, Mc Graw Hill, 2013.

Kernighan, Brian, W. and Dennis M. Ritchie. *The C Programming Language (Ansi C Version)*. 2nd ed. USA: Prentice Hall, 1988.

WEB RESOURCES

<http://www.cprogramming.com/tutorial/c-tutorial.html>

PATTERN OF EVALUATION

Continuous Assessment:

Total Marks: 50

Duration: 90 mins.

Theory – 25 marks

Practical – 25 marks

Section A - $3 \times 5 = 15$ marks (3 out of 4)

Section B - $1 \times 10 = 10$ marks (1 out of 2)

Third Component:

Quiz

Assignment

Debugging

Seminar

Implementation of data structures

End Semester Examination:

Total Marks: 100 marks

Duration: 3 hours

Theory – 50 marks Duration – 1 ½ hrs.

Practical – 50 marks Duration – 1 ½ hrs.

Section A- $5 \times 2 = 10$ marks (Answer all the questions)

(Atleast 1 question to be set from each unit excluding 4th unit)

Section B - $4 \times 5 = 20$ marks (4 out of 6)

(Atleast 1 question from each unit excluding 4th unit)

Section C - $2 \times 10 = 20$ marks (2 out of 3)

(Atleast 1 question from each unit excluding 4th unit)

(Questions for forty marks towards Section B and Section C should be set such that equal weightage is given to all units)

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086

MASTER OF SCIENCE (INFORMATION TECHNOLOGY)

SYLLABUS

(Effective from the academic year 2015 - 16)

DATABASE MANAGEMENT SYSTEMS

CODE: 15CS/PC/DB14

CREDITS : 4

L T P : 3 0 2

TOTAL TEACHING HOURS : 65

OBJECTIVES OF THE COURSE

- To learn the fundamentals of data models and to conceptualise and depict a database system using ER diagram
- To study SQL and relational database design
- To know the fundamental concepts of transaction processing- concurrency control techniques and recovery procedure
- To have an understanding of Storage and Query processing techniques

Unit 1 (13 hrs.)

1.1 Database Basics

Evolution of Database Management System - Advantages and Disadvantages of Database Management System – Characteristics of DBMS – DBMS Architecture – Database Models – Data Flow Diagrams – ER Model – Relational Algebra – Introduction – Flat file Database – Relational Database Model – Structure – Keys – Relational Algebra

1.2 Normalization

Functional Dependencies - 1NF, 2NF, 3NF, BCNF, 4NF - Oracle Database Server

Unit 2 (13 hrs.)

2.1 SQL Basics

SQL – Introduction to Operators in SQL, DDL, DML, TCL - DDL, DML and TCL commands – Data Retrieval

2.2 Constraints

Defining Constraints – Table level and Column level, Entity Integrity, Domain Integrity, Referential Integrity constraints - Constraints related query – Adding, Dropping and Disabling a constraint

2.3 Single Row Functions

Single Row Functions – Date, Numeric, Character, Conversion, Miscellaneous Functions

Unit 3 (15 hrs.)

3.1 SQL Functions

Group Functions, Set operators –union, minus and intersect

Advanced Database Constructs - GROUP BY, HAVING, ORDER BY, UNION, NULL

3.2 Joins and Sub queries

Joins – Equi Join, Non-Equi Join, Outer Join and Self-Join - Sub queries – IN, Exists, Correlated Sub queries - Table partition – View – Synonym – Sequence - Index- Unique, Composite - Oracle Privileges and Roles

- Unit 4** (14 hrs.)
- 4.1 PL/SQL Blocks**
PL/SQL Basics – Structure – PL/SQL and Oracle – Exceptions - Predefined, User defined
- 4.2 Cursors and Triggers**
Cursors and Cursor management – Implicit and Explicit Cursors – Advanced Cursors -
Procedures and functions - Database triggers - Parts of a trigger, Types of Triggers
- Unit 5** (10 hrs.)
- 5.1 Object-Oriented and Object Relational Databases**
Object Identity - Object Structure and Type Constructors - Encapsulation of Operations -
Methods and Persistence - Database Design for an ORDBMS - Nested Relations and
Collections - Storage and Access methods
- 5.2 Data Warehousing and OLAP**
Query processing, Optimisation and Execution Plan – Index File Organisation – Hashing
Distributed Architecture – Data Warehousing and Data Mining – Online Analytical
Processing and Materialised Views – OLAP concepts – Materialised Views – Oracle
features of Data Warehousing – Case study

TEXT BOOKS

Gupta, Das, Pranab Kumar, Krishna and P. Radha. *Database Management System Oracle SQL and PL/SQL*. 2nd ed. India: PHI, 2013.

Kimball, Ralph, Reeves, Laura et al. *Data warehousing lifecycle Toolkit: expert methods for designing, developing, and deploying data warehouses*. 2nd ed. USA: John Wiley, 2008.

Ponniah, Paulraj. *Data Warehousing Fundamentals*. 2nd ed. USA: John Wiley, 2009.

Silberschatz, A., Henry F. Korth and Sudarshan S. *Database System Concepts*. 5th ed. New Delhi: Tata McGraw Hill, 2006.

BOOKS FOR REFERENCE

Date, C. J., *Introduction to Database Systems*. 8th ed. New Delhi: Pearson Education, 2009.

Elmasri and Navathe. *Fundamentals of Database System*. 6th ed. New Delhi: Pearson Education, 2010.

Ramakrishna, Raghu and Johannes Gerhke. *Database Management Systems*. New Delhi: Tata McGraw Hill, 2003.

WEB RESOURCES

www.w3schools.com

<http://beginner-sql-tutorial.com/sql-group-functions.htm>

<http://www.tutorialspoint.com/mysql/index.htm>

<http://www.studytonight.com/dbms/database-normalization.php>

<http://www.oracle.com/technetwork/tutorials/index.html>

PATTERN OF EVALUATION

Continuous Assessment:

Total Marks: 50

Duration: 90 mins.

Theory – 25 marks

Practical – 25 marks

Section A - 3 x 5 = 15 marks (3 out of 4)

Section B - 1 x 10 = 10 marks (1 out of 2)

Third Component:

Seminars

Quiz

Group discussion

Assignments

Normalizing tables and Extracting relevant data

Query analysis and optimisation

End Semester Examination:

Total Marks: 100 marks

Duration: 3 hours

Theory – 50 marks Duration – 1 ½ hrs.

Practical – 50 marks Duration – 1 ½ hrs.

Section A- 5 x 2 = 10 marks (Answer all the questions)

(1 question to be set from each unit)

Section B - 4 x 5 = 20 marks (4 out of 6)

Section C - 2 x 10 = 20 marks (2 out of 3)

(Questions for forty marks towards Section B and Section C should be set such that equal weightage is given to all units)

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086

MASTER OF SCIENCE (INFORMATION TECHNOLOGY)

SYLLABUS

(Effective from the academic year 2015 - 16)

FORMAL LANGUAGES AND FINITE AUTOMATA

CODE: 15CS/PC/FF24

CREDITS : 4

L T P: 4 1 0

TOTAL TEACHING HOURS: 65

OBJECTIVE OF THE COURSE

- To understand the theoretical foundations of computer science through study of mathematical and abstract models of computers and the theory of formal languages and finite automata

Unit 1 (18 hrs.)

1.1 Fundamentals and Finite Automata

Basic concepts - Strings, Alphabets, Languages, Finite State Machine, Definitions, Finite Automaton model, Acceptance of Strings and Languages, Deterministic Finite Automaton (DFA) and Non-deterministic Finite automaton (NFA) - Transition diagrams and Language recognisers, Acceptance of languages, Equivalence of NFA and DFA (Proof needed), NFA with ϵ - transitions

Unit 2 (14 hrs.)

2.1 Regular Languages

The operators of Regular Expressions - Building Regular Sets Expressions, Precedence of Regular Expression operators, Finite Automata and Regular Expressions – From DFA's to Regular Expressions and Conversion of a given regular expression into a Finite Automata, Conversion of DFA into a Regular Expression by eliminating states, Pumping Lemma for Regular Sets (Proof needed), Closure Properties of Regular Sets (proofs not required)

Unit 3 (12 hrs.)

3.1 Grammar Formalism

Definition of a Context Free Grammars, Derivations using a Grammar, Language of a Grammar, Leftmost and rightmost derivation of strings and sentential forms, Parse Trees – Constructing parse trees, Yield of a parse tree, From Trees to derivations, Ambiguous Grammars, Removing Ambiguity from Grammars, Leftmost Derivation, Inherent ambiguity, Normal forms for Context Free Grammars

Unit 4 (11 hrs.)

4.1 Pushdown Automata

Definition – Model - Graphical notation - Instantaneous descriptions - Acceptance of Context Free Languages - Acceptance by Final State and Acceptance by Empty State and its Equivalence - Equivalence of Context Free Grammars and Pushdown Automata - Inter-conversion (Proofs not required) - Introduction to Deterministic Pushdown Automata

4.2 Turing Machines

Notation - Instantaneous descriptions - Transition Diagrams – Language - Turing Machines and Halting - Storage in the State - Multiple Tracks – Subroutines – Multitape Turing Machines

Unit 5 (10 hrs.)

5.1 Applications

Applications of Finite Automata - Text Search – Findings Strings in Text, Nondeterministic Finite Automata for Text Search, A DFA to Recognise a set of Keywords - Applications of Regular Expressions - Regular Expressions in UNIX, Lexical Analysis, Finding Patterns in Text - Applications of Context Free Grammars – Parsers, the YACC parser - Generator, Markup Languages, XML and Document – Type Definitions

TEXT BOOKS

Hopcroft, H.E., Rajeev Motwani and Ullman J. D. *Introduction to Automata Theory Languages and Computation*. 3rd ed. Pearson, 2011.

Martin, John C. *Introduction to languages and the Theory of Computation*. 4th ed. New Delhi: TMH, 2011.

BOOKS FOR REFERENCE

Cohen, Daniel I.A. *Introduction to Computer Theory* 2nd ed. USA: John Wiley, 2007.

Mishra and Chandrashekar. *Theory of Computer Science – Automata Languages and Computation*. 3rd ed. India: PHI, 2009.

PATTERN OF EVALUATION

Continuous Assessment:

Total Marks: 50

Duration: 90 mins.

Section A - $5 \times 2 = 10$ marks (Answer all the questions)

Section B - $4 \times 5 = 20$ marks (4 out of 5)

Section C - $2 \times 10 = 20$ marks (2 out of 3)

Third Component:

Seminars

Quiz

Group discussion

Assignments

Problem solving

End Semester Examination:

Total Marks: 100

Duration: 3 hours

Section A - $10 \times 2 = 20$ marks (Answer all the questions)
(2 questions to be set from each unit)

Section B - $6 \times 5 = 30$ marks (6 out of 8)
(Atleast 1 question from each unit)

Section C - $5 \times 10 = 50$ marks (5 out of 7)
(Atleast 1 question from each unit)

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MASTER OF SCIENCE (INFORMATION TECHNOLOGY)

SYLLABUS

(Effective from the academic year 2015 – 2016)

OBJECT ORIENTED PROGRAMMING WITH JAVA

CODE: 15CS/PC/OP24

CREDITS: 4

L T P: 3 1 2

TOTAL TEACHING HOURS: 78

OBJECTIVES OF THE COURSE

- To enable the students to understand and appreciate the need for Object Oriented Programming
- To equip the students in writing programs using Java
- To enable the students to understand GUI Programming with data base connectivity

Unit 1

1.1 Introduction to Java (15 hrs.)

Overview – Features - Fundamental OOPS concepts – JDK – JRE – JVM -
Structure of a Java program - Data types – Variables – Arrays – Operators –
Keywords - Naming Conventions - Control statements, Type conversion and
Casting - Scanner - String - equals(), equalsIgnoreCase(), length()

Unit 2

2.1 Classes and Objects (20 hrs.)

Class – Objects – Methods - Method Overloading - Constructors - Constructor
Overloading - this keyword - usage of static with data and methods - Garbage
Collection - Access Control

2.2 Inheritance

Concept – extends keyword - Single and Multilevel Inheritance – Composition –
super keyword - Method Overriding - Abstract Classes - Dynamic Method Dispatch –
Usage of final with data, methods and classes

2.3 Packages and Interfaces

Concepts - package and import keywords - Defining, Creating and Accessing a
Package – Interfaces - Multiple Inheritance in Java, Extending and Initialising fields
in Interfaces

Unit 3 (15 hrs.)

3.1 Exception Handling

Exception handling- Types of Exceptions- try, catch, throw, throws and finally keywords - User defined Exceptions

3.2 JDBC

Database Connectivity- Types of JDBC drivers- Executing statements- Prepared statements- Callable statements - Mapping SQL types to Java- ResultSetMetadata

Unit 4 (20 hrs.)

4.1 Multithreading

Introduction - Life Cycle of a Thread, Thread class and Runnable Interface, Thread Priorities, Synchronisation

4.2 GUI Programming with JavaFX

JavaFX Basic Concepts – Packages - Stage and Scene Classes - Nodes and Scene Graphs – Layouts - The Application Class and the Lifecycle Methods - Launching a JavaFX Application - JavaFX Application Skeleton - Compiling and Running - Application Thread

4.3 JavaFX Controls

Label – Button – Image – RadioButton – CheckBox – ListView- ComboBox- TextField - ScrollPane

Unit 5 (8 hrs.)

5.1 Event

Event Handling – Input Event, Action Event and Window Event

5.2 Java Library

Java.util – List, ArrayList

TEXT BOOKS

George Reese. *Database Programming with JDBC & Java*. 2nd ed. USA: O'Reilly.

Schildt, Herbert. *The Complete Reference – Java*. 9th ed. USA: McGraw Hill.

BOOKS FOR REFERENCE

Dietel & Dietel. *Java How to Program*. 8th ed. USA: Pearson Education.

Eckel, Bruce. *Thinking in Java*. 4th ed. USA: Pearson Education.

PATTERN OF EVALUATION

Continuous Assessment:

Total Marks: 50

Duration: 90 mins.

Theory – 25 marks

Practical – 25 marks

Section A - 3 x 5 = 15 marks (3 out of 4)

Section B - 1 x 10 = 10 marks (1 out of 2)

Third Component:

Quiz

Assignment

Debugging

Seminar

Mini Project

End Semester Examination:

Total Marks: 100 marks

Duration: 3 hours

Theory – 50 marks Duration – 1 ½ hrs.

Practical – 50 marks Duration – 1 ½ hrs.

Section A- 5 x 2 = 10 marks (Answer all the questions)

(1 question to be set from each unit)

Section B - 4 x 5 = 20 marks (4 out of 6)

Section C - 2 x 10 = 20 marks (2 out of 3)

(Questions for forty marks towards Section B and Section C should be set such that equal weightage is given to all units)

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI - 600 086

MASTER OF SCIENCE (INFORMATION TECHNOLOGY)

SYLLABUS

(Effective from the academic year 2015 – 2016)

OBJECT ORIENTED SYSTEM DEVELOPMENT

CODE: 15CS/PC/OU24

CREDITS: 4

L T P : 4 1 0

TOTAL TEACHING HOURS: 65

OBJECTIVES OF THE COURSE

- To provide an understanding of various Object Oriented concepts along with their applicability contexts
- To learn the life cycle of a software development process
- To learn various modelling techniques using UML

Unit 1 (11 hrs.)

1.1 Introduction to Software Engineering

Introduction - Software Engineering Failures – Concepts - Development Activities - Managing Software Development - Case Study

1.2 Modeling with UML

Introduction - Modeling Concepts - A Deeper View into UML

Unit 2 (12 hrs.)

2.1 Project Organisation and Communication

Introduction - A Rocket Example - An Overview of Projects - Project Organisation and Project Communication Concepts - Organisational Activities

Unit 3 (14 hrs.)

3.1 Requirements Elicitation

Introduction - Usability Examples - An Overview of Requirements Elicitation - Requirements Elicitation Concepts - Requirements Elicitation Activities - Managing Requirements Elicitation - Case Study

3.2 Analysis

Introduction - Optical Illusion - An Overview of Analysis - Analysis Concepts - Analysis Activities, From Use Cases to Objects, Managing Analysis - Case Study

Unit 4 (14 hrs.)

4.1 System Design - Decomposing the System

Introduction - A Floor Plan Example - An Overview of System Design - System Design Concepts - System Design Activities - From Objects to Subsystems

4.2 System Design - Addressing Design Goals

Introduction - A Redundancy Example - An Overview of System Design Activities - Concepts - UML Deployment Diagrams - System Design Activities - Addressing Design Goals, Managing System Design - Case Study

Unit 5 (14 hrs.)

5.1 Object Design - Reusing Pattern Solutions

Introduction, Bloopers - An Overview of Object Design - Reuse Concepts - Solution Objects, Inheritance, and Design Patterns - Reuse Activities - Selecting Design Patterns and Components, Managing Reuse - Case Study

5.2 Object Design - Specifying Interfaces

Introduction - A Railroad Example - An Overview of Interface Specification - Interface Specification Concepts - Interface Specification Activities - Managing Object Design - Case Study

TEXT BOOK

Bruegge, Bernd and Allen H. Dutoit. *Object-Oriented Software Engineering Using UML, Patterns, and Java*, 2nd ed. USA:Prentice Hall, 2009.

BOOKS FOR REFERENCE

Bahrami, Ali. *Object oriented Systems Development*. New York: McGraw-Hill.

Larman, Craig. *Applying UML and Patterns*, 3rd ed. USA:Pearson, 2005.

Stephen, Schach. *Software Engineering*, 7th ed. New York: McGraw-Hill, 2007.

WEB RESOURCES

<http://cs-exhibitions.uni-klu.ac.at/index.php?id=448>

<http://www.smartdraw.com/tutorials/software-oose/oose.htm?exp=sof>

PATTERN OF EVALUATION

Continuous Assessment:

Total Marks: 50

Duration: 90 mins.

Section A - $5 \times 2 = 10$ marks (Answer all the questions)

Section B - $4 \times 5 = 20$ marks (4 out of 5)

Section C - $2 \times 10 = 20$ marks (2 out of 3)

Third Component:

Seminars

Quiz

Open book tests

Group discussion

Assignments

Drawing UML Diagrams

Case Study

End Semester Examination:

Total Marks: 100

Duration: 3 hours

Section A - $10 \times 2 = 20$ marks (Answer all the questions)
(2 questions to be set from each unit)

Section B - $6 \times 5 = 30$ marks (6 out of 8)
(Atleast 1 question from each unit)

Section C - $5 \times 10 = 50$ marks (5 out of 7)
(Atleast 1 question from each unit)

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086

MASTER OF SCIENCE (INFORMATION TECHNOLOGY)

SYLLABUS

(Effective from the academic year 2015-16)

OPERATING SYSTEMS

CODE: 15CS/PC/OS24

CREDITS: 4

L T P: 3 0 2

TOTAL TEACHING HOURS: 65

OBJECTIVES OF THE COURSE

- To understand the services provided by and the design of an operating system
- To give hands-on experience in working in Linux environment
- To expose the students to open source OS code

Unit 1 (12 hrs.)

Introduction to Operating System

- 1.1 Introduction to OS - Structure, Operations, Computing Environments, Services, System Calls and its types, System Programs, OS Design and Implementation OS Debugging Operating, System Generation, System Boot
- 1.2 UNIX Operating System - History of UNIX, Shell, UNIX File System Structure, Commands for files and directories cd, cp, mv, rm, mkdir, more, less, creating and viewing files, using cat, date, who, pwd - filter commands –head tail, cut, paste, grep – regular expression - sort

Unit 2 (11 hrs.)

Processor Management

- 2.1 Process - Concept, Process Control Block, Process operations, Scheduling Algorithms - Short term and long term process scheduling policies - Scheduling Criteria - Multiple Processor Scheduling
- 2.2 Scheduling Algorithms - FCFS, SJF, Priority and Round Robin Scheduling
- 2.3 Critical section, Semaphores, Multithreading at System/User level
- 2.4 Process Synchronisation and Deadlock - Monitors, Deadlock Prevention and Avoidance, Deadlock Detection and Deadlock Recovery
- 2.5 Process Utilities - sh process, Parents and children, Process status, System process, Mechanism of process creation, Internal and external commands, running jobs in background, KILL, NICE, Job control, at and batch, cron

Unit 3 (12 hrs.)

File Organisation

- 3.1 File organisation and Access methods - Logical and Physical File structure - File Allocation methods, -Linked and Index Allocation - File Protection and Security - Directory structure - Single level, Two level, Tree structure - Free Space Management - Allocation Methods - Efficiency and Performance – Recovery – FAT32 and NTFS

3.2 File System - File Access Permission – chmod, chown, chgrp - File Comparisons - View Files - Listing files with attributes – Wildcards - Translating Characters - Links and its types - The File System – Partitions, File Systems, Kernel Accesses – Mounting - umask, ulimit - I/O redirection – Pipes - The vi editor

Unit 4 (15 hrs.)
Memory Management

4.1 Memory Management Techniques, Single Partition Allocation, Multiple Partition Allocation – Swapping - Paging and Segmentation - Segmented-Paged Memory Management Techniques - Logical and Physical Address space - Address Mapping - Demand paging - Virtual memory, protection and address mapping hardware, Page fault, Page replacement and Page removal algorithms
4.2 Shell Programming-Types of Shell - Environment Variables - Shell Variables Command-line Arguments – echo – expr – bc - if statement - case statement - while - until and for statements – break – continue- set

Unit 5 (15 hrs.)
Device Management

5.1 Classification of device according to speed, Disk structure
5.2 Disk scheduling - FCFS scheduling, SSTF scheduling
5.3 Access method and storage capacity
5.4 Disk Utilities - Disk usage, disk free, dd, Backups- cpio, tar, System calls for file management, directory management

TEXT BOOKS

Silberschatz, Abraham, Peter Baer Galvin and Greg Gagne. *Operating System Concepts*. 8th ed. Addison Wesley. (Chapters 1-12)

Sumitabha Das. *UNIX – Concepts & Applications*. 3rd ed. New Delhi: TataMcGraw Hill, 2000.
(Chapters 4-13,15,16)

Yukun Liu, Yong Yue, Liwei Guo *UNIX Operating System The Development Tutorial via UNIX Kernel Services*. Beijing: Higher Education Press (Chapters 1,2, 6-10)

BOOKS FOR REFERENCE

Kanetkar Yashwant. *UNIX Shell Programming*. BPB.

Rosen Kenneth, Douglas Host, Rachel Klee and Richard Rosinski. *UNIX: The Complete Reference*. 2nd ed. McGraw Hill/Osborne, 2007.

Sobell M. G. *A Practical Guide to Linux Commands, Editors, and Shell Programming*. USA: Pearson Education

WEB RESOURCES

www.tutorialspoint.com/unix

www.unixtutorial.org/

www.guru99.com/unix-linux-tutorial.html

PATTERN OF EVALUATION

Continuous Assessment:

Total Marks: 50

Duration: 90 mins.

Theory – 25 marks

Practical – 25 marks

Section A - 3 x 5 = 15 marks (3 out of 4)

Section B - 1 x 10 = 10 marks (1 out of 2)

Third Component:

Implementation of OS Concepts in linux using gcc

Case Study – Tracing any open source OS code

Seminar

Assignment

End Semester Examination:

Total Marks: 100 marks

Duration: 3 hours

Theory – 50 marks Duration – 1 ½ hrs.

Practical – 50 marks Duration – 1 ½ hrs.

Section A- 5 x 2 = 10 marks (Answer all the questions)

(1 question to be set from each unit)

Section B - 4 x 5 = 20 marks (4 out of 6)

Section C - 2 x 10 = 20 marks (2 out of 3)

(Questions for forty marks towards Section B and Section C should be set such that equal weightage is given to all units)

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI - 86
MASTER OF SCIENCE (INFORMATION TECHNOLOGY)
SYLLABUS

(Effective from the academic year 2015 – 2016)

ADVANCED JAVA PROGRAMMING

CODE: 15CS/PC/AJ34

CREDITS: 4

L T P : 3 0 2

TOTAL TEACHING HOURS: 65

OBJECTIVES OF THE COURSE

- To introduce students to multi-tier, object-oriented, Web based application
- To enable students to create applications using Servlets and Enterprise JavaBeans

Unit 1 (15 hrs.)

1.1 Introduction to J2EE

Tiered model architectures – Principles and Goals, J2EE definition and Characteristics - J2EE technologies in a multi-tier architecture

1.2 Java Servlet Technology

Role of Servlets - Dynamic web pages - Servlets vs. other technologies - Structure of Servlets - Servlet that generates plain text - Servlet that generates HTML - Servlets and Packages - Life cycle - Handling Client Request – FormData - Format of HTTP Response - Handling Cookies - Session Tracking - Request Dispatcher

Unit 2 (15 hrs.)

2.1 JSP Technology

Overview - Static vs. Dynamic text - Dynamic code and good JSP design - Expressions – Scriptlets – Declarations - Servlet code resulting from JSP scripting Elements - Scriptlets and Conditional text - Predefined variables

2.2 JSP page Directive

Purpose - Designating which classes are imported - Specifying the MIME type of the Page - Generating Excel spreadsheets - Participating in Sessions - Designating pages to handle JSP errors

2.3 Including Files and Applets in JSP Pages

jsp:include - include directive – Need for jsp:include – jsp:include vs. include directive - jsp:plugin to include applets for the Java Plug-in

2.4 JSPTag Extensions

Custom tags - Developing your first custom tags - Tag Libraries – Tag Library Descriptor - Taglib directive

Unit 3 (15 hrs.)

3.1 Introduction to Java EE

Understanding Java EE - Standards, Architecture, Specifications

3.2 Java Persistence

JPA Specification Overview - Understanding Entities - Object-Relational Mapping Querying Entities. Object-Relational Mapping - Mapping an Entity - Elementary Mapping - Tables, Primary Keys, Attributes, Collection of Basic Types, Map of Basic Types - Managing Persistent Objects - Querying an Entity - Entity Manager - Obtaining an Entity Manager - Persistence Context Manipulating Entities - persisting, finding, removing, merging, updating - Entity life cycle

3.3 JPQL

Select - Binding Parameters - Queries- Dynamic Queries

Unit 4 (15 hrs.)

4.1 Enterprise Java Beans

EJB - Types, Anatomy, EJB Container, Dependency Injection and JNDI

4.2 Session Beans

Session Beans - Stateless, Stateful - Session Bean Model – Local - Remote interfaces - Lifecycle of Session Bean

4.3 Sending Messages

Messages – JMS, MDB, Messaging Specification Overview, Send and Receive a Message, Java Messaging Service - Point-to-Point, Publish-Subscribe, JMS API, Message-Driven Beans - MDB Model- Consumer, Producer - Transaction - Handling Exceptions

Unit 5 (5 hrs.)

5.1 EJB – Java EE Integration

The Business Problem - Preview of final website - Scoping Technical Requirements - Business logic tier - Presentation tier

TEXT BOOKS

Goncalves, Antonio. *Beginning Java EE Platform with GlassFish*. 2nd ed. USA: Apress, 2010.

Hall, Marty and Larry Brown. *Core Servlets and JavaServer Pages*. 2nd ed. USA: Prentice Hall PTR, 2004

Sriganesh, Rima Patel et al. *Mastering Enterprise Java Beans 3.0*. 3rd ed. USA: John Wiley, 2006.

BOOKS FOR REFERENCE

Basham, Bryan, Kathy Sierra and Bert Bates. *Head First Servlets and JSP*. 2nd ed. O'Reilly, 2008.

Sierra, Kathy and Bert Bates. *Head First EJB*. 1st ed. USA: O'Reilly, 2003.

Bodoff, Stephaine, Dale Green et al. *The J2EE Tutorial*. 1st ed. USA: Pearson Education, 2002.

WEB RESOURCES

<http://download.oracle.com/javaee/6/tutorial/doc>

http://java.sun.com/j2ee/tutorial/1_3-fcs/doc/Servlets.html

http://java.sun.com/j2ee/tutorial/1_3-fcs/doc/JSPIntro.html

<http://java.sun.com/developer/onlineTraining/Beans/EJBTutorial>

http://download.oracle.com/javaee/1.3/jms/tutorial/1_3_1-fcs/doc/jms_tutorialTOC.html

<http://download.oracle.com/javase/jndi/tutorial>

PATTERN OF EVALUATION

Continuous Assessment:

Total Marks: 50

Duration: 90 mins.

Theory – 25 marks

Practical – 25 marks

Section A - 3 x 5 = 15 marks (3 out of 4)

Section B - 1 x 10 = 10 marks (1 out of 2)

Third Component:

Quiz

Assignment

Debugging

Seminar

Mini Project –Enterprise Application Development

End Semester Examination:

Total Marks: 100 marks

Duration: 3 hours

Theory – 50 marks Duration – 1 ½ hrs.

Practical – 50 marks Duration – 1 ½ hrs.

Section A- 5 x 2 = 10 marks (Answer all the questions)

(1 question to be set from each unit)

Section B - 4 x 5 = 20 marks (4 out of 6)

Section C - 2 x 10 = 20 marks (2 out of 3)

(Questions for forty marks towards Section B and Section C should be set such that equal weightage is given to all units)

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI - 86

MASTER OF SCIENCE (INFORMATION TECHNOLOGY)

SYLLABUS

(Effective from the academic year 2015 – 2016)

NETWORK MANAGEMENT AND ADMINISTRATION

CODE: 15CS/PC/NA34

CREDITS: 4

L T P: 4 1 0

TOTAL TEACHING HOURS: 65

OBJECTIVES OF THE COURSE

- To expose students to technical concepts of computer networks
- To facilitate students to install and manage a networking operating system
- To enable an understanding of the various tools for managing a network effectively

Unit1

(13 hrs.)

1.1 Network Essentials

Introduction - Types of Networks - Network Topology - Basic elements in Networking - Network Connecting Devices - OSI model

1.2 Network Administration Fundamentals

Basics of Workstation, Server and Service

1.3 Windows Server 2012 Administration Overview

Windows Server 2012 and Windows 8 - Introduction to Windows Server 2012 - Name-Resolution Services - Using Domain Name System, Using Windows Internet Name Service

Unit 2

(12 hrs.)

2.1 Managing Servers Running Windows Server 2012

Server Roles - Role Services - Features of Windows Server - Server Core Installations - Installing Windows Server 2012 - Performing a Clean Installation – Performing an upgrade Installation - Managing Roles, Role Services, and Features - Performing Initial Configuration Tasks - Server Manager Essentials and Binaries – Adding and Removing Roles - Role Services and Features - Managing System Properties - Computer Name Tab - Hardware Tab

2.2 Managing Applications, Processes, and Performance

Task Manager - Viewing and Working with Processes - Administering Processes

2.3 Using Active Directory

Active Directory and DNS - Read-Only Domain - Controller Deployment - Working with Domain Structures - Working with Active Directory Domains - Using Computers with Active Directory - Raising or Lowering - Domain and Forest Functionality - Understanding the Directory Structure - Exploring the Data Store - Exploring Global Catalogs - Replication and Active Directory

- Unit 3** (10 hrs.)
- 3.1 Management Tools**
Defragmentation - Disk Cleanup - Printing – Printing Basics, Installing local printers, Sharing printers, Printing to a file, Printing from DOS - File System and Functions - FAT and FAT32, NTFS Compression, Remote Administration
- 3.2 Data Sharing, Security, and Auditing**
Using Shadow Copies - Using, Configuring, and Managing NTFS Disk Quotas - Understanding NTFS Disk Quotas and how NTFS Quotas Are Used
- 3.3 Data Backup and Recovery**
Creating a Backup and Recovery Plan - Figuring Out a Backup Plan, Basic Types of Backup, Selecting Backup Devices and Media, Buying and Using Backup Media
- Unit 4** (12 hrs.)
- 4.1 Networking with TCP/IP**
Installing TCP/IP Networking - Configuring TCP/IP Networking - Configuring Static IP Addresses
- 4.2 TCP/IP tools**
TCP/IP tools – Ping, Tracert, Ipconfig - Understanding DNS - Introduction to the Domain Name System - Different classes of IP address- Subnetting
- 4.3 Security**
Security Basics - Design a Security Policy - The Castle Defense System - The Security Plan - Use Software Restriction Policies - General Active Directory Domain Services Security
- Unit 5** (10 hrs.)
- 5.1 Basics of communication technology**
Components of a Wireless Communication System - Architecture of a mobile Telecommunication System - Wireless Networking Standards - Wireless Local Area Networks (WLAN) - Bluetooth Technology
- 5.2 Introduction to Mobile Computing and Wireless Networking**
Introduction - Mobile Computing vs. Wireless Networking - Mobile Computing Applications - Characteristics of Mobile Computing - Structure of Mobile Computing Application - Cellular Mobile Communication - Global System for Mobile Communications (GSM) - General Packet Radio Service (GPRS) - Universal Mobile - Telecommunication System (UMTS)

Workshop on Network Management should be conducted for the students

(8 hrs.)

The workshop should include the following:

Configuration of Peer – to – Peer Network
Creating Workgroups
Installation of Windows Server 2012
Connecting minimum of 2 client machines to the Server Machine
Login Creation in Server
Giving Access Rights, Sharing of Files, Printer Sharing
Backups
Remote Administration

TEXT BOOKS

Forouzan, Behrouz. *Data Communications and Networking*. 4th ed. New Delhi: Tata McGraw Hill, 2006.

Ivens, Kathy. *The Complete Reference – MS Windows Server 2003*. 1st ed. New Delhi: Mcgraw Hill, 2003.

Limoncelli, Thomas A, Christina J. Hogan and Strata R. Chalup. *The Practice of System and Network Administration*. 2nd ed. USA: Pearson, 2007.

Pattnaik, Prashanth Kumar and Rajib Mall. *Fundamentals of Mobile Computing*. New Delhi: PHI Learning, 2012.

Ruest, Danielle and Nelson Ruest. *The Complete Reference – MS Windows Server 2008*. New Delhi: Mcgraw Hill, 2010.

Stanek, William R. *Windows Server 2012 Pocket Consultant*. 1st ed. USA: Microsoft Press, 2012.

BOOKS FOR REFERENCE

Tanenbaum, Andrew S. *Computer Networks 5/e*. New Delhi: Pearson, 2010.

WEB RESOURCES

<http://www.microsoft.com/en-in/server-cloud/products/windows-server-2012-r2/>

PATTERN OF EVALUATION

Continuous Assessment:

Total Marks: 50

Duration: 90 mins.

Section A - $5 \times 2 = 10$ marks (Answer all the questions)

Section B - $4 \times 5 = 20$ marks (4 out of 5)

Section C - $2 \times 10 = 20$ marks (2 out of 3)

Third Component:

Seminars

Quiz

Open book tests

Group discussion

Assignments

Mock Installation, Disk Cleanup and Partitioning

End Semester Examination:

Total Marks: 100

Duration: 3 hours

Section A - $10 \times 2 = 20$ marks (Answer all the questions)
(2 questions to be set from each unit)

Section B - $6 \times 5 = 30$ marks (6 out of 8)
(Atleast 1 question from each unit)

Section C - $5 \times 10 = 50$ marks (5 out of 7)
(Atleast 1 question from each unit)

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI - 600 086

MASTER OF SCIENCE (INFORMATION TECHNOLOGY)

SYLLABUS

(Effective from the academic year 2015 – 2016)

RESEARCH METHODOLOGY

CODE : 15CS/PC/RM34

CREDITS: 4

L T P : 3 1 1

TOTAL TEACHING HOURS: 65

OBJECTIVES OF THE COURSE

- To develop an understanding of the quantitative and qualitative research methods relevant to effectively address a particular research problem
- To understand the use of statistics and data analysis in research
- To develop core competencies in writing a research proposal

Unit 1 (13 hrs.)

1.1 Introduction to Research

Meaning – Objectives – Motivation – Types – Approaches – Significance – Research Methods vs Methodology - Research and Scientific Method – Importance of knowing how research is done - Research process - Criteria of good research - Necessity of defining a problem - Techniques involved in defining a problem - Meaning of Research Design

Unit 2 (12 hrs.)

2.1 Data Collection Methods

Primary Data - Observation Method, Personal Interview, Telephonic Interview, Mail Survey, Questionnaire design

2.2 Secondary Data

Internal Sources of Data - External Sources of Data - Data Presentation – Frequency Distribution, Cumulative Frequency Distribution, Relative Frequency Distribution, Charts

Unit 3 (15 hrs.)

3.1 Hypotheses Testing

Definition – Testing – Testing of Hypotheses - Concerning Means, Concerning Proportion, Concerning Variance

3.2 Non parametric tests

One Sample tests - One Sample Sign test – Chi-Square test – Kolmogrov – Smirnov test – Run test for randomness – Two Sample test - Two Sample Sign test – Mann Whitney U test - K Sample test – Kruskal Wallis test

Unit 4 (15 hrs.)

4.1 Data Analysis

Sensitivity analysis with data tables – Goal seek – Scenario Manager -
Summarising Data with Histograms and Descriptive Statistics - Pivot tables -
Summarising data with Database Statistical Functions – Using Correlation –
Multiple Regression - ANOVA

4.2 Multivariate Statistical Techniques

Discriminant Analysis - Factor Analysis – Cluster Analysis — Multiple
Regression and Correlation – Canonical Correlation – Application of Statistical
Software Package in Research

Unit 5

Report Writing

(10 hrs.)

- 5.1 Types of Report - Guidelines to review report - Typing instructions, Oral
presentation
5.2 Report writing using LATEX for a research problem

TEXT BOOKS

Kothari C. R. *Research Methodology Methods and Techniques*. 2nd ed. New Delhi: New Age, 2004.

Panneerselvam R. *Research Methodology*. 2nd ed. New Delhi: Prentice Hall, 2014.

BOOKS FOR REFERENCE

Raykov, Tenko, George A. Marcoulides. *An Introduction to Applied Multivariate Analysis*. 1st ed. USA: Routledge, 2008.

WEB RESOURCES

<https://explorable.com/research-methodology>

<http://www.palgrave.com/studentstudyskills/page/choosing-appropriate-research-methodologies/>

<http://www.limat.org/data/research/Research%20Methodology.pdf>

PATTERN OF EVALUATION

Continuous Assessment:

Total Marks: 50

Duration: 90 mins.

Section A - $5 \times 2 = 10$ marks (Answer all the questions)

Section B - $4 \times 5 = 20$ marks (4 out of 5)

Section C - $2 \times 10 = 20$ marks (2 out of 3)

Third Component:

Seminars

Quiz

Open book tests

Group discussion

Assignments

Literature review

Problem analysis

Case Study and Report Writing

End Semester Examination:

Total Marks: 100

Duration: 3 hours

Section A - $10 \times 2 = 20$ marks (Answer all the questions)
(2 questions to be set from each unit)

Section B - $6 \times 5 = 30$ marks (6 out of 8)
(Atleast 1 question from each unit)

Section C - $5 \times 10 = 50$ marks (5 out of 7)
(Atleast 1 question from each unit)

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI - 86

MASTER OF SCIENCE (INFORMATION TECHNOLOGY)

SYLLABUS

(Effective from the academic year 2015 – 2016)

VISUAL PROGRAMMING

CODE: 15CS/PC/VP34

CREDITS: 4

L T P : 3 0 2

TOTAL TEACHING HOURS: 65

OBJECTIVES OF THE COURSE

- To introduce the concepts of Web Programming using ASP.NET
- To introduce advanced concepts of Web Technology and LINQ using C# and ASP.NET

Unit 1

1.1 C# Fundamentals (14 hrs.)

Overview of .NET Framework - C# Fundamentals- Variables and Constants, Value Types, Reference Types, Type Conversions, Boxing and Unboxing, Expressions and Operators, Flow Control and Exception Handling - Control Flow Statements: Selection Statements, Iteration Statements or Loops, Jump Statements - Exception Handling - try...catch...finally Statement, throw Statement - Exploring Namespaces, Classes and Objects - Syntax of a Class, Method as Class Member, Access Modifiers, Objects, Constructors and Destructors, Static Classes and Static Class Members - Properties

Unit 2

(13 hrs.)

2.1 ASP.NET

Life cycle- Specifying a Location for a Web Application -Single-File Page Model - Code-Behind Page Model - Adding controls to web form

2.2 Web Server Controls

The Control Class - The WebControl Class - The Button Control - The TextBox Control -The Label Control - The HyperLink Control -The LinkButton Control -The Placeholder Control - The HiddenField Control - The CheckBox Control -The RadioButton Control - The ListBox Control -The DropDownList Control -The Image Control -The ImageButton Control - The Table Control - Menus - Validation Server Controls - Master page - Web.Config

Unit 3 (14 hrs.)

3.1 State Management

Understanding the session object - Sessions and the Event Model, Configuring, In-Process Session State, Out-of-Process Session state - Application Object - Query strings - Cookies, -ViewState - Global.asax

3.2 XML and .NET

Basics of XML - Create XML Document - Reading XML with XmlReader - Reading XML with XmlDocument - Working with XmlNode - Using XPath with XmlDocument - Writing XML with XmlWriter - Writing XML with XmlDocument - The XMLDataSource Control

Unit 4 (12 hrs.)

4.1 LINQ

Introducing LINQ Queries - Standard Query Operators - Introducing LINQ to Dataset, SQL and XML - The LinqDataSource Control - Data Binding – Grid View, Details view, Forms view

Unit 5 (12 hrs.)

5.1 ASP. NET AJAX

Understanding the need for AJAX - Building a simple ASP.NET page without AJAX - Building a simple ASP.NET page with AJAX

5.2 Crystal Reports

Overview to Crystal Reports - Creating Crystal Reports with wizards - Integrating with Web Applications

Demo on deployment of web application

TEXT BOOKS

Deitel, Paul and Harvey M. Deitel. *C# 2012 for Programmers*. Pearson Education, 5th ed.

Kogent Learning Solutions. *C# 2012 Programming Covers .NET 4.5 Black Book*. Dreamtech press, 2013.

BOOKS FOR REFERENCE

Liberty, Jesse. *Programming C#*. 4th ed. O'Reilly Media, 2009.

Schildt, Herbert. *Complete Reference C#*. New Delhi: TMH Publication, 2009.

WEB RESOURCES

<https://msdn.microsoft.com/en-us/library/aa288436%28v=vs.71%29.aspx>

<http://www.w3schools.com/aspnet/aspnet.asp>

<http://csharp.net-tutorials.com/xml/introduction/>

<http://ajax.net-tutorials.com/basics/introduction/>

PATTERN OF EVALUATION

Continuous Assessment:

Total Marks: 50

Duration: 90 mins.

Theory – 25 marks

Practical – 25 marks

Section A - 3 x 5 = 15 marks (3 out of 4)

Section B - 1 x 10 = 10 marks (1 out of 2)

Third Component:

Quiz

Assignment

Debugging

Seminar

Mini Project – Web Application Development

End Semester Examination:

Total Marks: 100 marks

Duration: 3 hours

Theory – 50 marks Duration – 1 ½ hrs.

Practical – 50 marks Duration – 1 ½ hrs.

Section A- 5 x 2 = 10 marks (Answer all the questions)

(1 question to be set from each unit)

Section B - 4 x 5 = 20 marks (4 out of 6)

Section C - 2 x 10 = 20 marks (2 out of 3)

(Questions for forty marks towards Section B and Section C should be set such that equal weightage is given to all units)

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086

MASTER OF SCIENCE (INFORMATION TECHNOLOGY)

SYLLABUS

(Effective from the academic year 2015 - 16)

PHP WITH LINUX

CODE: 15CS/PC/PL44

CREDITS : 4

L T P : 3 0 2

TOTAL TEACHING HOURS: 65

OBJECTIVES OF THE COURSE

- To introduce the students to open source technology
- To enhance the knowledge of web technology using HTML5 and PHP

Unit 1 (13 hrs.)

1.1 HTML5

HTML rules - Structure of HTML documents - Limitations of HTML - Introduction to HTML5 - Semantic/ Structural Elements - article, aside, bdi, details, dialog, figcaption, figure, footer, header, main, mark, menuitem, meter, nav, section, summary, time, wbr - Handling Forms – Graphics – canvas - Media Elements - audio, source, embed, video - Using CSS

Unit 2 (12 hrs.)

2.1 JavaScript

JavaScript and HTML Text - Variables, Operators, Functions, Arrays, Expressions and Control Flow - Literal and variables - The with statement - Using onerror, try, catch – Conditionals – Looping - Event Handling

Unit 3 (10 hrs.)

3.1 Objects

Object Hierarchy Model - Window Object, Document Object, String Object, Math Object, Date object, Boolean object, Location object, History Object - Regular Expression

3.2 Exceptional Handling

Handling errors by using try throw and catch statements

3.3 CSS and JQuery

Accessing CSS from JavaScript - JQuery

Unit 4 (16 hrs.)

4.1 PHP

Introduction to dynamic web content – Benefits - Setting up a development server – Introduction to PHP – Structure, Expressions and Control Flow - Expressions, Operators, Conditionals, Looping, Implicit and Explicit casting - Functions - PHP Functions, Including and Requiring Files – Arrays - Handling Forms using PHP –

Cookies - Sessions

Unit 5

(14 hrs.)

5.1 Database Connectivity with MySQL

Introduction to MySQL - Accessing MySQL Using PHP - Creating, Adding, Dropping, Deleting, Searching and Updating Data using PHP and MySQL

Practical on HTML5 and PHP using LAMP/XAMP web server in LINUX

TEXT BOOKS

Filson, Eric, Eric Rosebrock. *Setting up LAMP: Getting Linux, Apache, MySQL, and PHP Working Together*. SYBEX, 2008.

Nixon, Robin. *Learning PHP, MySQL, JavaScript, CSS and HTML5*. 3rd ed. USA: O'reilly, 2014.

BOOKS FOR REFERENCE

Converse Tim and Joyce Park with Clark Morgan. *PHP 5 and MySQL Bible*. India: Wiley, 2008.

Schumann Sascha and Deepak Veliath. *Professional PHP programming*. 1st ed. Wrox, 1999.

PATTERN OF EVALUATION

Continuous Assessment:

Total Marks: 50

Duration: 90 mins.

Theory – 25 marks

Practical – 25 marks

Section A - 3 x 5 = 15 marks (3 out of 4)

Section B - 1 x 10 = 10 marks (1 out of 2)

Third Component:

Quiz

Assignment

Debugging

Seminar

Mini Project – Web Application Development in Linux Environment

End Semester Examination:

Theory – 50 marks

Duration – 1 ½ hrs.

Practical – 50 marks

Duration – 1 ½ hrs.

Theory Pattern

Section A - 5 x 2 = 10 marks (Answer all the questions)

(1 question to be set from each unit)

Section B - 4 x 5 = 20 marks (4 out of 6)

Section C - 2 x 10 = 20 marks (2 out of 3)

(Questions for forty marks towards Section B and Section C should be set such that equal weightage is given to all units)

STELLA MARIS COLLEGE (AUTONOMOUS) – CHENNAI – 600 086
MASTER OF SCIENCE (INFORMATION TECHNOLOGY)

SYLLABUS

(Effective from the academic year 2015 - 16)

PROJECT

CODE: 15CS/PC/PR49

CREDITS: 9

L T P: 0 0 12

OBJECTIVE OF THE COURSE

- To help students to develop an application to suit the research/business needs

GUIDELINES TO UNDERTAKE THE FINAL SEMESTER PROJECT

One of the important stipulations regarding project for M.Sc. is that it should be in the area of Computer Science/ Computer Applications. Students are required to develop an application to suit the research/business needs.

The Dissertation must include the following. These are general guidelines which may differ slightly as per the demand of the study topic.

Introduction

- Existing System
- Proposed System
- Create a set of Design principles to implement the proposed system

System Analysis

- Development Environment
- Requirement Specification
- Software Requirements Specification

System Design

- Logical Design of the System
- Database Design
- Screen Design
- Report Design

Implementation

- Database creation
- Coding

Code Review and Testing

- Code Review
- Testing Process

- Front-end Validation
- Back-end Validation

Deployment

Conclusion

- Summary of findings, conclusions for future enhancement
- Suggestions

Bibliography

Appendix

PATTERN OF EVALUATION

Internal Assessment – 50 marks

Based on the criteria listed below, internal marks will be awarded.

1. Timely completion of assigned tasks
2. Individual Involvement and team work
3. Quality of the Application and documentation (Design, Workflow, Testing, Precision, Relevance)
4. Achievement of project deliverables
5. Presentation of Completed work
6. Viva-Voce

End Semester Examination – 100 marks

Project Document must be submitted at the end of the semester. The student must present the completed project work. A viva-voce based on the work will also be conducted.

Mark will be allotted based on the following criteria which may differ slightly as per the demand of the study topic.

Requirement Analysis	– 10 marks
Database Design	– 10 marks
Screen Design	– 10 marks
Coding	– 10 marks
Validation	– 10 marks
Testing	– 10 marks
Reports	– 5 marks
Documentation	– 20 marks
Special Features	– 5 marks
Viva – Voce	– 10 marks

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086
MASTER OF SCIENCE (INFORMATION TECHNOLOGY)
SYLLABUS

(Effective from the academic year 2015 - 16)

SOFTWARE QUALITY ASSURANCE AND TESTING

CODE: 15CS/PC/ST44

CREDITS : 4

L T P : 3 0 2

TOTAL TEACHING HOURS: 65

OBJECTIVES OF THE COURSE

- To learn the practices that support the production of quality software
- To enable the students to understand the quality models and software testing techniques

Unit 1 (12 hrs.)

1.1 Introduction

Software Quality - Role of Testing - Verification and Validation, Objectives and Issues of Testing - Testing activities and levels - Sources of Information for Test Case Selection – White Box and Black Box Testing - Test Planning and Design – Monitoring and Measuring Test Execution - Test Tools and Automation - Test Team Organisation and Management

1.2 System Test Design

Test Design Factors - Requirement Identification - Characteristics of Testable Requirements - Test Design Preparedness Metrics - Test Case Design

Unit 2 (13 hrs.)

2.1 System Test Planning and Automation

Structure of a System Test Plan - Introduction and Feature Description – Assumptions – Test Approach - Test Suite Structure - Test Environment - Test Execution Strategy - Test Effort Estimation - Scheduling and Test Milestones - System Test Automation – Evaluation and Selection of Test Automation Tools - Test Selection Guidelines for Automation - Characteristics of Automated Test Cases - Structure of an Automated Test Case - Test Automation Infrastructure

Unit 3 (13 hrs.)

3.1 Unit Testing

Concept - Static Unit Testing - Defect Prevention - Dynamic Unit Testing - Mutation Testing – Debugging - Unit Testing in extreme Programming

3.2 Control Flow Testing

Outline - Control Flow Graph - Paths in a Control Flow Graph - Path Selection Criteria – All-Path Coverage Criterion - Statement Coverage Criterion - Branch Coverage Criterion – Predicate Coverage Criterion - Generating Test Input - Examples of Test Data Selection

Unit 4 (13 hrs.)

4.1 Data Flow Testing

Data Flow Anomaly - Overview of Dynamic Data Flow Testing - Data Flow Graph – Data Flow Terms - Data Flow Testing Criteria - Comparison of Data Flow Test Selection Criteria - Feasible Paths and Test Selection Criteria -Comparison of Testing Techniques

4.2 System Integration Testing

Concept - Different Types of Interfaces and Interface Errors - Granularity of System Integration Testing - System Integration Techniques - Software and Hardware Integration - Test Plan for System Integration - Off-the-Shelf Component Integration – Off-the-Shelf Component Testing - Built-in Testing

Unit 5 (14 hrs.)

5.1 Acceptance Testing

Types of Acceptance Testing, Acceptance Criteria, Selection of Acceptance Criteria, Acceptance Test Plan, Acceptance Test Execution, Acceptance Test Report, Acceptance Testing in extreme Programming

5.2 Software Quality

Five Views of Software Quality - Quality Factors and Criteria - Relationship between Quality Factors and Criteria - Quality Metrics - ISO 9126 - Quality Characteristics - ISO 9000:2000 Software Quality Standard - ISO 9000:2000 Fundamentals, ISO 9001:2000 Requirements.

TEXT BOOK

Naik, Sagar and Piyu Tripathy. *Software Testing and Quality Assurance: Theory and Practice*. New Jersey: Wiley, 2008.

BOOKS FOR REFERENCE

Jorgensen, Paul C. *Software Testing - A Craftsman's Approach*. Fl: CRC Press, 2003.

Smart, John. *Java Power Tools*. O'Reily Media, 2008.

William, Perry. *Effective methods for Software Testing*. 3rd ed. Asia: Wiley, 2006.

JOURNALS

Deming, W. E. *Out of the Crisis*. MIT, Cambridge, MA, 1986.

Garvin D. A. *What Does "Product Quality" Really Mean?* Sloan Management Review, Fall 1984, pp. 25–43.

Ishikawa K. *What Is Total Quality Control* . Prentice-Hall, Englewood Cliffs, NJ, 1985.

Juran, J. M. and A. B. Godfrey. *Juran's Quality Handbook*, 5th ed. McGraw-Hill, New York, 1998.

Kilpatrick, J. *Lean Principles*. <http://www.mep.org/textfiles/LeanPrinciples.pdf>, 2003, pp. 1–5.

Kitchenham, B. and S. L. Pfleeger. *Software Quality: The Elusive Target*. *IEEE Software*, January 1996, pp. 12–21.

WEB RESOURCES

http://www.tutorialspoint.com/software_testing/

<http://www.softwaretestinghelp.com/>

<http://www.etestinghub.com/>

<http://www.qatutorial.com/>

<http://www.guru99.com/software-testing.html>

PATTERN OF EVALUATION

Continuous Assessment:

Total Marks: 50

Duration: 90 mins.

Theory – 25 marks

Practical – 25 marks

Section A - 3 x 5 = 15 marks (3 out of 4)

Section B - 1 x 10 = 10 marks (1 out of 2)

Third Component:

Seminars

Group discussion

Assignments

Writing Test cases using tools

Case studies

End Semester Examination:

Theory – 50 marks Duration – 1 ½ hrs

Practical – 50 marks Duration – 1 ½ hrs

Theory Pattern

Section A - 5 x 2 = 10 marks (Answer all the questions)

(1 question to be set from each unit)

Section B - 4 x 5 = 20 marks (4 out of 6)

Section C - 2 x 10 = 20 marks (2 out of 3)

(Questions for forty marks towards Section B and Section C should be set such that equal weightage is given to all units)