CMR Institute of Technology, Bangalore

Department(s): Masters of Computer Applications

Semester: 01 | Section(s): A

Data Structures using C | 16MCA11 | Lectures/week: 05

Course Instructor: Dr. Deepa Anand

Course duration: Aug. 2016 – Nov 2016

Course objectives:

- To Understand ADT & their representations as data structures.

- To understand the use of iteration and recursion.

- To understand the concepts behind important data structures such as stacks, queues, linked list, arrays and trees and ability to apply the appropriate data structure.

- To be able to code the data structures along with their operations.

Prerequisites:

- Discrete Mathematics

- C/C++ Programming

Class	Chapter Title / Reference	Topic	Percentage of portion	
			Reference	Cumulative
	TB1 : 1.1 & 1.2	**Introduction to Data Structures** Information and its meaning: Abstract Data Types, Sequences as Value Definitions, ADT for Varying length character Strings, Data Types, Pointers and review of Pointers, DataStructures.		
1-12			12	**12**

13-20	TB1 2.1-2.3 3.1-3.3	**Stack and Recursion** Definition and examples , Primitive operations, Example, The stack as an ADT, Representing stacks ,Implementing the pop operation, Testing for exceptional conditions, Implementing the push operations , Examples for infix , postfix, and prefix expressions, Basic definition and Examples ,Program to evaluate a postfix expression ,Converting an expression from infix to postfix, Program to convert an expression from infix to postfix, Applications of Stacks: Expression Evaluations, Recursion etc. Recursion: definition and processes, Factorial function, Multiplication of natural numbers,	13	**25**
21-2	TB1 : 4.1 - 4.3	**Queues and Lists** The queue and its sequential representation. The queue as ADT, Insert operation Priority queue, Array implementation of a priority queue. Linked lists, Inserting and removing nodes from a list, Linked implementations of stacks, getnode and Freenode operations, Linked implementation of queues, Linked list as a data Structure. Example of list operations, Header nodes, Array implementation of lists, Limitations of array implementation.	14	**41**
27-3	TB1: 6.1-6.5	**Sorting and Searching** Bubble sort, Quick sort, Selection sort, Tree Sorting: Binary Tree Sort, Heap Sort, Insertion Sorts: Simple Insertion, Shell Sort, Address Calculation Sort, Merge and Radix Sort.	12	**53**

		search, Interpolation search, Tree searching: Inserting into a Binary Search Tree ,Deleting form a binary search tree,		
33-3	TB1-5.1-5.6	**Binary Trees** Tree traversals, Binary Search Tree and Operations,	9	**62**

Syllabus for Internal Exams:

Sessional #	Syllabus
T1	Class # 01 – 20
T2	Class # 21 – 40
T3	Class # 41 – 62

Literature:

Book Type	Code	Author & Title	Publication info	
			Edition & Publisher	**ISBN #**
Text Book	TB1	Data Structures Using C and C++ by Yedidyah Langsam and Moshe J. Augenstein and Aaron	2nd Edition, Pearson Education	8120311779
References	RB1	Data Structures and Algorithm Analysis in C, Mark Allen Weiss	2nd Edition, Pearson Education	0201498405
References	RB2	Richard F Giberg and Behrouz A Forouzan: Data Structures – A Pseudo code Approach with C	2nd Edition, Cengage Learning	0534390803
References	RB3	Robert Kruse, C L Tondo, Bruce Leung and Shashi Mogalla: Data Structures and Program Design in	2nd Edition, Pearson Education	8177584235

CMR Institute of Technology, Bangalore		
Department(s):Master of Computer Applications		
Semester: 05	Section(s): - A	

UNIX Programming   16MCA12   Lectures/week: 06

Course Instructor(s): Ms.Sumalatha P

Course duration: July 2016 – November 2016

Course Objective:

Working with UNIX operating system and writing and execution of Shell scripts

Course Pre-requisites:

An understanding about Operating System would be helpful

Course Outcome:

1. Understand and experience the UNIX environment, File system and hierarchy.

2. Demonstrate commands to extract, interpret data for further processing.

3. Apply commands to perform different tasks on various applications

4. Analyze the usage of different shell commands

5. Evaluate different commands with sample shell scripting and variables.

Class	Chapter Title /	Topic	Percentage of portion covered

#	Reference Literature		Reference	Cumulative
		Introduction, History, Architecture		
		Experience the Unix environment		
		Basic commands - ls, cat, cal, date, calendar, who, printf, tty, sty, uname, passwd, echo, tput, bc, script,		
3		Introduction to Shell Scripting		
	Unit 1 : Introduction of UNIX & Shell	Read command line arguments, Exit status of a command,		
		The logical operators && and ||, exit, if and case conditions, expr, sleep and wait		
		The here document, set, trap	10	10
6	**Unit 2 : UNIX File System**	The file, What's in a file name?		
		The parent- child relationship, pwd, the Home directory		
		absolute pathname, using absolute pathnames for a command, cd, mkdir, rmdir, Relative pathnames	10	20

		Unix File System, Basic File Attributes: ls – l, the		
		Security and File Permission, users and groups, security level, changing permission,		
		File Attributes, More file attributes: hard link, symbolic link,		
	Unit 3 : **Filters and AWK**	Pr, head, tail, cut, paste, sort, uniq, tr commands, Filters using Regular Expression : grep & sed grep, Regular Expression, egrep, fgrep, sed instruction		
		Line Addressing, Inserting and Changing Text, Context addressing, writing selected lines to a file, the –f option, Substitution,		
		Awk-Advanced Filters: Simple awk Filtering, Splitting a Line into Fields, printf		
		the Logical and Relational Operators, Number		
		BEGIN and END positional Parameters, get line, Builtin variables Arrays, Functions		
17		Interface with the Shell, Control Flow.	10	30
18	**Unit 4: Object** **Advanced Shell** **Programming**	The sh command		
19		export, cd, the Command, expr		
		Conditional Parameter Substitution, Merging		40
21		Shell Functions, eval		
		Exec Statement and Examples	10	
	Unit 5 : Process **and System** **Administration**	Process basics, PS, internal and external commands, running jobs in		
24		nice, at and batch, cron, time commands		
		Essential System Administration root, administrator's privileges, startup & shutdown,		
		Customizing the Environment: System Variables, profile, sty, PWD, Aliases, Command History, Online		
		Advanced System Administration: Case Study:	10	50

Syllabus for Internal Assessment Test

T1	Class # 01 – 11
T2	Class # 12 – 22

T3	Class #23-27 + Previous Syllabus Revision

Literature

Book Type	Code	Author & Title	Publication Info	
			Edition & Publisher	ISBN #
Text Book	TB1	Your UNIX The Ultimate	Tata Mc Graw Hill	
Reference	RB1	Unix Shell Programming, Yashwant Kanetkar		
Reference	RB2	Beginning Shell Scripting, Eric Foster Johnson, John C Welch, Micah Anderson	Wrox publication	
Reference	RB3	UNIX: Concepts and	Tata Mc Graw Hill	

CMR Institute of Technology, Bangalore		
Department(s):Master of Computer Applications		
Semester: 01	Section(s): -	
Web Technologies	16MCA13	Lectures/week: 06
Course Instructor(s): Ms Uma B		
Course duration: September 2016 – January 2016		

Course Objective:

To make the student evolve from a novice to a professional web developer

Course Pre-requisites:

Basic knowledge of internet and opening web pages in google chrome or IE.

Course Outcome:

- Develop Web apps using various development languages and tools.
- Build the ability to select the essential technology needed to develop and implement web applications
- Compare Scripting language utilities for static and dynamic environment
- Design XML document and presentation of XML document using css and xslt.
- Justify the need for CGI programming between PERL and various markup languages.

Name of the Faculty: Ms Uma B   Total # of Hrs: 62   # of hrs / week : 6

Class #	Chapter Title / Reference Literature	Topic	Percentage of portion covered	
			Reference	Cumulative
1	TB1 1.1 to 1.9	**Web Fundamentals** Internet, WWW, Web Browsers and Web Servers	28	28
2	TB2 1.1 to 1.10	URLs, MIME, HTTP		
3		Security, The Web Programmers Toolbox		
4		Evolution of the web, Peak into the history of web		
5		Internet Applications, Networks		
6		TCP/IP, Higher Level Protocols,		
7		Important components of the web, Web Search Engines, Application Servers		
8	T.B1 2.2 to TB1 2.10	**Introduction to XHTML and Javascript** Basic syntax, Standard Structure	30	58
9		Basic text markup, Images, Hypertext Links.		
10		Lists, Tables		
11		Forms		
12		Frames		
13	TB1 3.1 to TB1 3.12 TB1 4.1 to 4.14	CSS: Introduction, Levels of style sheets, Style specification formats		
14		Selector forms, Property value forms		
15		Font properties, List properties		
16		Color, Alignment of text,		

17		The box model, Background images,		
18		The <span> and <div> tags, Conflict resolution.		
19		Overview of javascript		
20		object orientation and java script		
21		Syntactic characteristics,primitives,operations and expressions		
22		Screen output and keyboard input		
23		control statements		
24		object creation and modification		
25		Functions		
26		Arrays		
27		Constructors		
28		Pattern matching using regular expressions		
29		Errors in scripts, Examples		
30	TB1 5.1 to 5.10	**Javascript and Dynamic documents** The Javascript execution environment, Element access in JavaScript	22	80
31		The document object model		
32		Events and Event Handling		
33	TB1 6.1 to 6.11	Handling events from the body elements		
34		Handling events from Button elements		
35		Textbox and Password elements		
36		The DOM2 Event Model, The navigator Object		
37		DOM Tree traversal and Modification.		
38		Introduction, Positioning Elements, Moving Elements	10	80
39		Element visibility, Changing Colors and Fonts		
40		Dynamic Content		
41		Locating the Mouse Cursor, Reacting to a mouse click		
42		Slow movement of elements, Dragging and dropping elements.		
43		stacking elements		
44		Slow movement of elements, Dragging and dropping elements		
45	TB1 7.1 to 7.11	**Introduction to XML** Introduction, Syntax, Document structure	10	90
46		Document type definitions,		
47		Namespace,xml schemas		

48		Displaying raw xml documents,		
49		Displaying xml documents with CSS		
50		XSLT style sheets,		
51		XML processors		
52		Web Services		
53	TB1 8.1 to 8.11 9.1 to 9.6	**Perl and CGI Programming** Origins and uses of perl,scalars and their operations	10	100
54		Assignments Statements and simple input and output,		
55		Control Statements		
56		Fundamental of arrays,Hashes,		
57		References,Functions		
58		Pattern Matching,		
59		File Input and Output, Examples.		
60		Using Perl for CGI Programming: The common gateway interface,		
61		CGI linkage, Query string format		
62		CGI pm module,A survey example,cookies		

Syllabus for Sessionals :

Sessional #	Syllabus
T1	Class # 01–18
T2	Class # 19-44
T3	Class # 45-62

Literature:

Book Type	Code	Author & Title	Publication info	
			Edition & Publisher	ISBN #
Text Book	TB1	Robert W. Sebesta: Programming the World Wide Web	4th Edition, Pearson education, 2012	978-81-317-2417-0
Text Book	TB2	M. Srinivasan: Web Technology Theory and Practice	Pearson Education, 2012	978-81-317-7419-9
References	RB1	Jeffrey C. Jackson: Web Technologies- A Computer Science Perspective	Pearson Education, Eleventh Impression, 2012.	978-0-13-185603-5
References	RB2	Chris Bates: Web Programming Building Internet Applications	3rd Edition, Wiley India, 2009	978-1-25-900558-9
References	RB3	Internet Technology and Web Design, Instructional Software Research and Development (ISRD) Group	Tata McGraw Hill, 2011	978-0-07-107276-2

CMR Institute of Technology, Bangalore		
Department(s):Master of Computer Applications		
Semester: 01	Section(s): A	
Foundations of Computer Organization	16MCA14	Lectures/week: 05
Course Instructor(s): Ms. Gomathi T		
Course duration: Sep 2016 – Dec 2016		

Course Objective:

To Understand Digital systems and Computer organization. Write assembly language programs

Course Pre-requisites:

Fundamentals of digital arithmetic

Course Outcome:

CO1: Understand the Basics of Digital System
CO2: Understand the Basics of Computer System Organization
 CO3: Apply concepts of the number system in designing Digital System.
CO4: Analyze the need of Logic circuits in digital system
CO5: Create logic circuits for real time requirement

Class #	Chapter Title / Reference Literature	Topic	Percentage of portion covered	
			Reference	Cumulative
1	TB1: Chapter 1, Chapter 2, Chapter 3.	Binary Systems, Digital Computers and Digital Systems,	11.54	11.54
2		Binary Numbers, Number Base Conversion		
3		Octal and Hexadecimal Numbers, subtraction using r's and r-1 complements		
4		Binary Code, Binary Storage and Registers		
5		Binary Logic, Integrated Circuits.		
6		Axiomatic Definition of Boolean Algebra,		
7		Basic Theorems and Properties of Boolean Algebra, Boolean Functions,		
8		Basic Theorems and Properties of Boolean Algebra, Boolean Functions,		
9		Canonical and Standard Forms, Other Logic Operations,		
10		Digital Logic Gates, The map Method, Two – and Three – Variable Maps, Four – Variables Map,		
11		Revision		
12		Revision		
13	TB1:	NAND and NOR Implementation,	23.08	34.62
14		Other Two- Level Implementations, Don't Care Conditions.		

15	Chapter 4, Chapter 5, Chapter 6, Chapter 7	Introduction, Adders, Subtractors, Binary Parallel Adder,		
16		Decimal Adder, Magnitude Comparator, Decoders, Multiplexers, BOOTH algorithm for signed numbers with example.		
17		BOOTH algorithm for signed numbers with example. Sequential Logic		
18		Introduction, different types of Flip – Flops,		
19		Triggering of flip flops		
20		Registers, Shift Registers,		
21		Ripple counter and Synchronous Counter		
22		Revision		
23		Revision		
24		Revision		
25	TB2: Chapter 1, Chapter 2	Basic Structure of Computers		
26		Computer Types,		
27		Functional Units,		
28		Basic Operational Concepts,,		
29		Bus structure		
30		Software, Performance,	11.54	34.62
31		Multiprocessing and Multicomputer,		
32		Introduction to Assemblers and Compilers. Machine Instruction and Programs		
33		Memory Locations and Addresses,		
34		Memory Operations,		
35		Instructions and Instruction Sequencing,		
36		Addressing Modes		
37		Revision		
38	TB2: Chapter 4	Examples from Assembly Language Programming.		
39		Examples from Assembly Language Programming.		
40		Input/output Organization		
41		Accessing I/O Devices,	35.38	70
42		Accessing I/O Devices		
43		Interrupts		
44		D M A		
45		Processor Example, Buses.		

46		Processor Example, Buses.		
47		Case study of IA32 Intel processor		
48		Case study of IA32 Intel processor		
49		Revision		
50	TB2:	Basic concepts, semiconductors, RAM		
51	Chapter 5	Semiconductor RAM Memories,		
52		Semiconductor RAM Memories,		
53		Read – Only Memories, Speed, Size, and Cost,		
54		Read – Only Memories, Speed, Size, and Cost,		
55		Cache Memories,	30	100
56		Virtual Memories,,		
57		Memory Management Requirements		
58		Secondary Storage.		
59		Revision		
60		Revision		

Syllabus for Internals:

Session #	Syllabus
T1	Class # 01 – 18
T2	Class # 19 – 39
T3	Class # 40 – 60

Literature:

Book Type	Code	Author & Title
Text Book	TB1	Digital Logic and Computer Design [M Morris Mano]
Text Book	TB2	Computer Organization [Carl Hamacher, Zvonko Vranesic Safwat Zaky]
References	RB1	Computer Architecture and Organization [John P Hayes]
References	RB2	Digital Electronics - Principles and Applications [Soumitrs Kumar Mnadal]

CMR Institute of Technology, Bangalore		
Department(s):Master of Computer Applications		
Semester: 01	Section(s): --	
OperatingSystems	16MCA15	Lectures/week: 04
Course Instructor(s): Mrs. B. Vijaya Lakshmi		
Course duration: Aug 2016 – Dec 2016		

Course objective:

1. To understand the services provided by and the design of an operating system.
2. To understand the structure and organization of the file system.
3. To understand what a process is and how processes are synchronized and scheduled.
4. To understand different approaches to memory management.
5. Students should be able to use system calls for managing processes, memory and the file system.
6. Students should understand the data structures and algorithms used to implement an OS.

Course outcomes:

1. CO1: Understand the Basics of Digital System

2. CO2: Understand the Basics of Computer System Organization
3. CO3: Apply the concepts of the number system in Designing Digital system.
4. CO4: Analyze the need of Logic circuits in digital system
5. CO5: Create logic circuits for real time requirement

Class #	Chapter Title / Reference Literature	Topic
1		**Computer and Operating Systems Structure :**Basic Elements, Processor Registers, Instruction Execution
2		The Memory Hierarchy, Cache Memory, I/O Communication Techniques,
3		Introduction to Operating System,
4		Mainframe Systems, Desktop Systems, Multiprocessor Systems,
5	TB1:Module1	Distributed Systems, Clustered Systems, Real Time Systems, Handheld Systems
6		Feature Migration, Computing Environments.
7		**System Structures:**System Components,
8		Operating System Services, System Calls,
9		System Programs, System Structure,Virtual Machines,

10		System Design and Implementation, System Generation
11		**Process Management and Mutual Execution :**Process, Process States,
12		Process Description, Process Control,
13		Execution of the Operating System,
14		Security Issues, Processes and Threads,
15		Symmetric Multiprocessing(SMP), Micro kernels,
16		Scheduler and Scheduling.
17		Principles of Concurrency
18		M u t u a l E x c l u s i o n : Hardware Support,
19		S e m a p h o r e s ,
20		M o n i t o r s , Message Passing,
21	TB1: Module2	Readers/Writes Problem.
22		**Deadlockand Memory Management:** PrinciplesofDeadlock,
23		DeadlockPrevention,Deadlock Avoidance,
24		DeadlockDetection,AnIntegratedDeadlockStrategy,
25		Dining Philosophers Problem
26		**MemoryManagement:** Swapping,ContiguousMemoryAllocation
27		Paging, Segmentation
28		SegmentationwithPaging,
29		DemandPaging,
30		ProcessCreation,
31		Page Replacement,
32		AllocationofFrames,Thrashing
33		**FileSystem and SecondaryStorage:** FileConcept,AccessMethods,Directory Structure
34		FileSystemMounting,FileSharing,Protection,
35	TB1 :Module 4	File–SystemStructure,
36		File–SystemImplementation,
37		DirectoryImplementation
38		AllocationMethods
39		Free–SpaceManagement,
40		DiskStructure
41		DiskScheduling

42		DiskManagement
43		**ComputerSecurity and CasestudyofLinuxOperatingsystem:** TheSecurityProblem,
44		UserAuthentication,ProgramThreats,
45		SystemThreats. Linux System Linuxhistory,
46	TB1 :Module 5	DesignPrinciples,Kernelmodules,
47		Process, management, scheduling,
48		Memory management, Filesystems,
49		Input and output,
50		Interprocesscommunications

Literature:

Book Type	Code	Author & Title	Edition
Text Book	TB1	Silberschatz, Galvin, Gagne, "OperatingSystemConcepts" John Wiley	6th Edition, Pearson Education, 2004
Text Book	TB2	William Stallings, "OperatingSystemInternalsandDesignPrinciples"	6th Edition, Pearson Education, 2012