EASWARI ENGINEERING COLLEGE, CHENNAI-600 089
DEPARTMENT OF INFORMATION TECHNOLOGY
LESSON PLAN

SUBJECT CODE : **CS 6202**

SUBJECT TITLE : Programming and Data Structures I

HOURS DISTRIBUTION : (L T P C 3 0 0 3)

COURSE/ BRANCH : B.Tech. / IT

SEMESTER : II

ACADEMIC YEAR : 2014 - 2015

FACULTY NAME : M.Sowmiya

OBJECTIVE OF COURSE :

The student should be made to:

- Be familiar with the basics of C programming language.
- Be exposed to the concepts of ADTs
- Learn linear data structures – list, stack, and queue.
- Be exposed to sorting, searching, hashing algorithms

OUTCOME OF COURSE :

At the end of the course, the student should be able to:

- Use the control structures of C appropriately for problems.
- Implement abstract data types for linear data structures.
- Apply the different linear data structures to problem solutions.
- Critically analyze the various algorithms.

- **PREREQUISTE** **:** BASIC KNOWLEDGE IN C LANGUAGE

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LESSON PLAN

Subject Code	:	**EC 6504**		**Total no. of hours given in syllabus**		
Subject Title	:	**Programming and Data Structures I**		Tutorials	:	0
Course/Branch	:	B.Tech/ IT		Practical	:	0
Year/Semester	:	I/II		Lecture	:	45
Academic Year	:	2014-2015		**TOTAL**	:	**45**
Faculty Name	:	M.Sowmiya				

AIM:

- To have depth knowledge of C Language.
- To study how to handle File Concept in C.
- To have a depth knowledge of Algorithms.
- To study the Sorting and Searching Algorithms.

Sl.No	TOPIC	No.of Periods	Reference Books	Page No
UNIT I	**PROGRAMMING FUNDAMENTALS- A REVIEW**		**9**	
Objectives: To introduce the basics of C programming language				
1	Basics of C programming language - A Recall	1		
2	Conditional statements and Control statements	1	T1	55-66
			R1	5.9-5.32
3	Arrays	1	T1	22-24, 28-30
			R1	6.4-6.12
4	Functions - Basics, Passing arguments by value and address	1	T1	24-28
			R1	8.4-8.21
5	Functions- Passing arrays, Recursion	1	T1	86-88
			R1	8.21-8.38
6	Preprocessor	1	T1	88-92

7	Pointers and Variation in pointer declarations	1	T1	93-114, 122-126
			R1	6.12-6.31
8	Function Pointers	1	T1	118-121
			R1	8.38-8.43
9	Function with Variable number of arguments	1	R1	8.46-8.47
UNIT II	**C PROGRAMMING ADVANCED FEATURES**			**9**
Objectives: To learn the Advanced feartures in C programming				
10	Structures	1	T1 R1	127-132 9.4-9.12
11	Example Programs using Structures	1	R1	9.13-9.24
12	Pointers to structures,Array of structures, Nested structures	1	T1 R1	132-143 9.24-9.31
13	Unions	1	T1 R1	147-149 9.38-9.41
14	Example Programs using Union	1	R1	9.46-9.49
15	File handling concepts	1	T1	151-159
16	File read,write	1	T1	160-165
17	Binary and Stdio	1	R2	444-447
18	File Manipulation	1	R2	452-457
UNIT III	**LINEAR DATA STRUCTURES – LIST**			**9**
Objectives: To introduce the concepts of ADTs				
19	Abstract Data Types (ADTs)- List ADT Array implementation	1	T2	57-59
20	List ADT- Linked list implementation	1	T2	59-60
21	Singly linked lists -Insertion and Deletion operation	1	T2	60-67
22	Doubly linked lists -Insertion and Deletion operation	1	T2	67-68 Handouts
23	Linked lists -Merge and Traversal operation	1	Handouts	
24	Circularly linked lists	1	T2 R4	68 302-314
25	Applications of lists	1	T2	72-73
26	Polynomial Manipulation -Addition	1	R4	297-302
27	Polynomial Manipulation -Multiplication	1	Handouts	
UNIT IV	**LINEAR DATA STRUCTURES – STACKS, QUEUES**			**9**
Objectives: To understand the concepts Linear Data Structure				
28	Stack ADT -Linked List implementation	1	T2	78-82
29	Stack ADT -Array implementation	1	T2	82-87
30	Evaluating arithmetic expressions-Infix to Postfix	1	T2	90-93

	conversion			
31	Evaluating arithmetic expressions- expression evaluation	1	T2	88-90
32	Other applications- Balancing parentheses,function calls	1	T2	87,93-95
33	Queue ADT -Linked List implementation	1	R4	387-392
34	Queue ADT -Array implementation	1	R4	379-382
35	Circular queue implementation	1	T2	95-100
36	Double ended Queues, Applications of queues	1	R4 T2	392 100
UNIT V	**SORTING, SEARCHING AND HASH TECHNIQUES**			**9**
Objectives: To introduce the concepts of Hashing and Sorting				
37	Sorting algorithms: Insertion sort and Selection sort	1	R4	586-591
38	Shell sort and Bubble sort	1	T2 R4	238-239 581-586
39	Quick sort	1	T2	595-599
40	Merge sort and Radix sort	1	R4	591-595 599-603
41	Searching: Linear search and Binary Search	1	R4	155-160
42	Hashing: Hash Functions, Separate Chaining	1	T2	165-173
43	Open Addressing -linear probing, double hashing	1	T2	173-175, 180-181
44	Open Addressing - quadratic probing	1	T2	176-180
45	Rehashing,Extendible Hashing	1	T2	181-187
Total		**45**		

Difficult Topics Identified:

S. No.	Topics	Teaching Aids
1	Hashing	PPT
2	Open Addressing	PPT

ASSIGNMENT TOPICS

SL.NO	ASSIGNMENT TOPICS
1	CONDITIONAL STATEMENT PROGRAMS USING C LANGUAGE.
2	INFIX TO POSTFIX EXPRESSION & EVALUATION.
3	COMPARISON BETWEEN ALL SORTING ALGORITHMS.

TEXT BOOKS

1. Brian W. Kernighan and Dennis M. Ritchie, “The C Programming Language”, 2nd Edition, Pearson Education, 1988.
2. Mark Allen Weiss, “Data Structures and Algorithm Analysis in C”, 2nd Edition, Pearson Education, 1997.

REFERENCES

1. Anita Goel and Ajay Mittal, “Computer Fundamentals and Programming in C”, Dorling Kindersley (India) Pvt. Ltd., Pearson Education in South Asia, 2011.
2. Yashavant Kanetkar,"Let us C",12th Edition,BPB Publications,2012
3. Thomas H. Cormen, Charles E. Leiserson, Ronald L.Rivest, Clifford Stein, “Introduction to Algorithms", Second Edition, Mcgraw Hill, 2002.
4. Reema Thareja, “Data Structures Using C”, Oxford University Press, 2011.
5. Aho, Hopcroft and Ullman, “Data Structures and Algorithms”, Pearson Education,1983.
6. Stephen G. Kochan, “Programming in C”, 3rd edition, Pearson Ed.

Prepared By

Mrs. M.Sowmiya

Approved By

HOD

PROGRAMME EDUCATIONAL OBJECTIVES

1. Graduates will be proficient in utilizing the fundamental knowledge of basic sciences and mathematics to the applications relevant to various streams of Engineering and Technology.

2. Graduates will possess core competencies necessary for application of knowledge of computers and telecommunications equipment to store, retrieve, transmit, manipulate and analyze data in the context of business enterprise.

3. Graduates will be capable of thinking logically, pursue lifelong learning and will have the capacity to understand technical issues related to computing systems and design optimal solutions.

4. Graduates will be able to develop hardware and software systems by understanding the importance of social, business and environmental needs in the human context.

5. Graduates will gain employment in organizations and establish themselves as professionals by applying their technical skills to solve real world problems and meet the diversified needs of industry, academia and research.

6. Graduates will be aware of professional ethics of the software industry and equip themselves with communication skills essential for working in community.

PROGRAMME OUTCOMES (a-l)

(a) Ability to apply knowledge of computing and mathematics appropriate to Information Technology

(b) Ability to analyze a problem, and identify computing requirements appropriate to its solution

(c) Ability to design, implement, and evaluate a system, process, component, or program to meet specific requirements

(d) Ability to interpret and synthesis data to provide valid conclusions

(e) Ability to function effectively as a team member to achieve a common goal

(f) Ability to understand professional, ethical and social issues and responsibilities

(g) Ability to communicate effectively with a diverse groups

(h) Ability to analyze the local and global impact of Information Technology on society

(i) Ability to recognize and engage in continuing professional development and life long learning

(j) Ability to use current techniques, skills, and tools necessary to accomplish projects related to Information Technology.

(k) Ability to understand the impact of the professional engineering solutions in societal and environmental contexts for sustainable development.

(l) Ability to understand engineering and management principles to manage projects in multidisciplinary environment.

UNITS	*Course outcome*	***PEO1***	***PEO 2***	***PEO3***	***PEO 4***	***PEO5***	***PEO 6***	***PO a***	***PO b***	***PO c***	***PO d***	***PO e***	***PO f***	***PO g***	***PO h***	***PO i***	***PO j***	***OC k***	***PO l***
PROGRAMMING FUNDAMENTALS-A REVIEW	Design C Programs for problems.	**M**	**S**	**S**	**S**	**M**	**W**	**M**	**W**	**S**	**S**	**M**	**W**	**W**	**W**	**S**	**S**	**W**	**M**
C PROGRAMMING ADVANCED FEATURES	Write and execute C programs for simple applications	**W**	**S**	**S**	**S**	**S**	**W**	**M**	**M**	**M**	**W**	**W**	**M**	**W**	**M**	**M**	**S**	**W**	**M**
LINEAR DATA STRUCTURES – LIST	Design and implement C programs for implementing linked lists.	**W**	**S**	**S**	**S**	**S**	**W**	**M**	**M**	**W**	**S**	**W**	**M**	**W**	**M**	**M**	**S**	**W**	**M**
LINEAR DATA STRUCTURES – STACKS, QUEUES	Apply the different data structures for implementing solutions to practical problems.	**M**	**S**	**S**	**S**	**S**	**W**	**M**	**M**	**W**	**S**	**W**	**W**	**W**	**M**	**M**	**S**	**W**	**M**
SORTING, SEARCHING AND HASH TECHNIQUES	Demonstrate fundamental understanding on the operation between Sorting and Searching.	**W**	**S**	**S**	**S**	**S**	**W**	**M**	**M**	**W**	**M**	**W**	**W**	**W**	**M**	**M**	**S**	**W**	**M**

MAPPING OF COURSE OUTCOMES WITH PEO & THE PROGRAMME OUTCOME- PROGRAMMING AND DATA STRUCTURES I (CS 6202)

STRONG	S
MEDIUM	M
WEAK	W