CSE213(L): Data Structures and Algorithms Lab

Programme: B.Tech. Year: I Semester: II
Course: Core Credits: 1 Hours: 20

Course Context and Overview:
The objective of the course is to develop understanding, skills and experiences to design and select efficient and effective data structures for the computational problems. Through the lab work, the students will gain knowledge through hand-on experiments in the use of many commonly used data structures. The students will learn to apply the understanding of various data structures in solving real world computing problems.

Prerequisites Courses: Computer Programming

Course outcomes (COs):

On completion of this course, the students will have the ability to:	
CO1:	Implement array-based and link(pointer)-based data-structures and their associated operations
CO2:	Solve computing problems and applications by employing the common data-structures
CO3:	Efficiently model the information in a problem by selecting appropriate data-structure to match program efficiency and other non-functional specifications

List of Lab Exercise Domains:

Topics	**Lab Hours**
User defined C headers, Structures and Pointers, Unix commands, multi-file C programs, defensive programming – assert(), program testing and debugging	5
Implementation of Linked Lists, related ADT interface operations	2.5
Implementation of Stack, and some related applications	2.5
Implementation of queue, and some related applications	2.5
Implementation of tree, and some related operations	2.5
Implementation of heaps, and some related search applications	2.5
Implementation of graphs, associated operations and applications	2.5

Text-books:

1. Reema Thareja, "*Data Structures using C",* Oxford University Press, 2014 (2nd End).
2. Aho A.V., J.E. Hopcroft, J.D. Ullman, "*Data Structures and algorithms",* Pearson

Reference books:

1. Aaron M. Tenenbaum, Y. Langsam, Moshe J. Augenstein, "*Data Structures Using C",* PHI learning (2009).
2. Allen Weiss, *"Data Structures and Algorithm Analysis in C++".*
3. Robert L. Kruse, Bruce P. Leung, Clovis L. Tondo, *"Data Structures and Program Design In C"* (2nd Edition), Prentice Hall, 1996.
4. Aho A.V., J.E. Hopcroft, J.D. Ullman *"Data Structures and algorithms",* Addison Wesley.
5. Horowitz and Sahni, "*Data Structure in C++",* Glagotia.
6. Ellis Horowitz, Sartaj Sahni, *"Fundamentals of Data Structures,"* Computer Science Press.
7. Niklaus Wirth, *"Algorithms + Data Structures = Programs*", Prentice-Hall Series in Automatic Computation.
8. Sartaj Sahni, *"Data Structures, Algorithms, and Applications in C++",* TMH.

Evaluation Methods*:

Item	Weightage
First mid-term stage progression examination*	20%
Second mid-term stage progression examination*	20%
Endterm to demonstrate the best skills stage learned*	20%
Continuous Evaluation	24%
Attendance – assesses pre-lab preparation, sincere in-lab efforts and post-lab work for the previous session	16%

Dates for three lab examinations and each lab session will be available to the students at the start of the semester.

**The lab examinations will be staged. A student can appear for only one stage in an examination slot. After the first and the second mid-term examination, each student will be advised about their progression options. However, the student will be free to choose the examination levels for the second mid-term and the end-term examinations.*

If a student chooses to repeat examination at a level attempted previously, the maximum score at that level, amongst all attempts, will be considered for that level.

It is expected that the threshold for C grade will be 35% marks. Grade B threshold will be similarly minimum 50% marks. For the top grade the required minimum performance is 70%.

Clear expected minimal level for the grades is provided in this CIF to help the students plan their efforts appropriately.

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