Data Structures Course Specifications

Faculty: Computer and Informatics

Department: Scientific Computing

Program(s) on which the course is given :   Bachelor in Computer and Information Sciences

Major or Minor element of programs   :   All majors

Department offering the program   :   Scientific Computing

Department offering the course   :   Computer Science

Academic year / Level   :   2nd Year / B.Sc.

Date of specification approval   :   7/10/2009

A. Basic Information

Title : Data Structures   **Code   : CS270**

Credit Hours :---   **Lecture : 2** hrs/Week

Tutorial :   **Practical : 2** hrs/Week

Total: 4 hrs/Week

B. Professional Information

1. Overall aims of course:

By the end of the course the students will be able to:

1. Understand the concepts of the Data Structures.
2. Define and use standard data structures classes.

3. Design program with different data structures: array, linked list, stacks, queues, trees and Hash tables.

4. Describe common applications for each data structure in the topic list.

5. Compare alternative implementations of data structures with respect to the performance.

6. Compare and contrast the costs and benefits of dynamic and static data structure implementations.

7. Choose the appropriate data structures for modeling a given problem.

2. Intended Learning Outcomes of Course (ILOs):

a- Knowledge and Understanding:

a1. Understanding Programming concepts, Object Oriented concepts and different Data Structures.

b- Intellectual skills

b1 - Ability to define the computer science problems
b2 - Ability to drive different solution alternatives for the computer science problems
b3 - Ability to analyze the solution alternatives and choose the optimum one

c- Professional and practical skills
c1 - Ability to use computer aided design tools
c2 - Management of computer systems resources
c3 - Using and coding for computer application in different domains**.**
c4 - Design, build and develop programs of varying levels of complexity using C++.

d- General and Transferable Skills:

Knowledge of the concepts and material presented in this course will provide the students with the capability to:

d1- Use data structures effectively to solve practical problems.

d2- Write and present effective computer programs that employ efficient algorithms.

d3- Work in stressful environment and within constraints.

d4- Search for information and adopt life-long self-learning.

d5- Ability to work in a team.

e- Attitude:

e1. A knowledge and respect of ethical standards in relation to a major area of study.

e2. Relationship Emphasis a successful with other students.

e3. Know the danger of viruses and how to protect yourself from it.

3. Contents:

Topic	No. of hours	Lecture	Tutorial/ Practical
Overview of C++ Language & Abstract Data Types	4	2	2
Complexity analysis	2	1	1
Linked lists	4	2	2
Stacks and queues	4	2	2
Recursion	4	2	1
Trees	6	3	2
Sorting	4	2	2
Hash Tables	4	2	1
Total	32	16	13