CSC242 Introduction to Data Structure

CLASS SESSIONS: This course will be delivered using Asynchronous Distance Learning (ADL) along with a weekly tutorial session. Tutorial sessions will use video conferencing facilities at UVI and will enable you to enhance your understanding of the subject matter delivered asynchronously (via the BLACKBOARD website). You will be expected to participate **at least four (4) times per week** via your computer on the BLACKBOARD course website. During these periods you will make use of the web-based materials provided via BLACKBOARD or through other Internet and library resources), complete and submit assignments, correspond by e-mail and participate in bulletin board (BBS) discussions.

CREDITS: 4

COURSE DESCRIPTION: An introduction to data structures, program specifications and design emphasizing abstract data types and their implementation. Arrays, lists, queues, trees, and graphs will be examined along with their implementation for specific applications. Set operations involving abstract data types will be covered. A series of searching and sorting techniques using various data structures will be analyzed looking at efficiencies based on memory and run time.

PRE-REQUISITES: CSC118 and either MAT 143 or MAT 140

TEXT: "Data Structures, Algorithms & Software Principles in C", Thomas A. Standish. 1995, Addison-Wesley Publishing Company, Inc., ISBN 0-201-59118-9

COURSE OVERVIEW: This course focuses on the abstract data types (ADT's) stacks, queues, lists, trees, graphs, and tables. The programming techniques for manipulating these data structures developed in csc118 will be further developed and the use of C++ language features to isolate the details of data structure implementation from programs using the ADTs will be explored. Programming assignments will be used to illustrate techniques but understanding concepts will also be emphasized.

COURSE OBJECTIVES:

After completing this course, students will be able to:

1. Compare, select and implement techniques for manipulation of lists, trees, stacks, queues, graphs, tables, etc.

2. Design and implement various abstract data types in C/C++.

3. Design and implement programs with several layers of representation, using information hiding appropriately in the interfaces to these layers.

CONTENT (TOPIC) OUTLINE:

1: Introduction and C++ Review

2: Linked data representations

3: Recursion

4: Modularity

7: Stacks and Queues

8: Lists and Strings

9: Trees

10: Graphs

11: Hashing and Tables

12: External collections of data

TEACHING AND LEARNING METHODS: Materials will be presented on the BLACKBOARD website, via Internet Sources and via email. Reading assignments and examples will be reviewed during tutorials. Discussions during tutorials and via BBS will provide practice in critical thinking and expression. Dialog over BBS and email will supplement and replace face-to-face meetings. Tutorial assistance will be provided during weekly scheduled tutorial sessions, over email and telephone.

STUDENT RESPONSIBILITIES:

Students should note that this is a four credit course, equivalent to a normal classroom course which meets four times each week, and should expect to spend an AVERAGE of at least two hours/day over the seven days of the week on studies and assignments.

1. You must maintain a working e-mail address; ensure that your e-mail box does not become full; and notify your instructor immediately should you change your e-mail address.

2. You must respond to e-mails sent to you promptly. If you will not be able to check your mail for more than 48 hours you must notify your instructor. **Any e-mail you send must include "242" in the subject.**

3. You are expected to log on regularly to the BLACKBOARD course **website (at least FOUR times per week**). During these periods you should study the course notes, complete assignments and take an active part in Bulletin Board (BBS) discussions.

4. Receipt of work submitted for marking (such as assignments) will normally be acknowledged within 24 to 48 hours. Should you not receive such an acknowledgement, it is your responsibility to contact your instructor immediately to ensure that the work was received.

5. Assignments, etc, submitted after the due date will not normally earn full credit. Whilst reasons for late submission will be taken into account, you may (subject to our discretion) receive a penalty of up to 5% per day after the due date. Naturally, if no appropriate reasons are given, this penalty will automatically apply. Assignments will not be accepted after they have been reviewed during a tutorial.

6. Students are expected to maintain high standards of academic honesty. Students are expected to abide by the UVI standard of conduct relating to academic honesty and are fully responsible for the integrity of submitted work. All student work submitted - examinations, assignments, reports, project, and BBS entries – must be the student's own work. Should you wish to quote the work of another person or, for example, make use of an Internet source, you are required to clearly reference this source and properly delineate (for example, by means of quotation marks) the extent of the quotation. Cutting and pasting material from Internet (or other) sources is not acceptable – refer to page 60 in the UVI Catalog. You should also review the penalties for academic dishonesty which will be enforced in this course.

7. For a course with an asynchronous component, the importance of regularly accessing and studying the course material cannot be over-emphasized. If, for any reason, your personal circumstances prevent you from working on course material at least four times in a particular week, you should let your instructor know as soon as possible. Should you feel that you are falling behind with course material, it is your responsibility to inform your instructor in order any problems can be identified and resolved. Should you intend to be absent for a period of 3 days or more, it is your responsibility to inform your instructor in advance.

8. A student cannot normally pass this course without attending (and gaining a satisfactory result in) both the mid-term and final examinations

METHOD OF EVALUATION:

Assignments	25%
BBS and email:	20%
Quizzes	25%
Final examination:	30%