**B O W I E S T A T E UN I V E R S I T Y**

*Department of Computer Science*

COSC/CTEC 445: Cryptography & Applications

COSC 214 Data Structure & Algorithms

**Instructor:** Dr. Frank Xu

**Office:** Computer Science Building #216

**Office Hours:** TR: 2:55-4:55 pm

**Phone: 2-**3965

**Email:** wxu@bowiestate.edu

**Classroom:** Computer science building # 109

**Class Times:** TR: 4:55-7:25 pm

**CATALOG DESCRIPTION**:

Definition and implementation of basic data structures such as stacks, queues, lists, sets, trees, and graphs. Memory management and garbage collection algorithms. Algorithm design and introductory analysis associated with the basic data structures. Internal sorting and searching algorithms

**PREREQUISITES**: COSC 113 and COSC 208

**REQUIRED TEXT**:

D.S. Malik, Data Structures Using C++, Course Technology, ISBN 0-619-15907-3

**PROGRAM OUTCOMES (PO):**

1. Knowledge of mathematical and scientific foundations, algorithms, programming languages and computer science theory, and the ability to apply this knowledge to analyze a problem, define computing requirements for its solution, and design a practical solution.

(a) An ability to apply knowledge of computing and mathematics appropriate to the discipline

(b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution

(j) An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.

1. Knowledge of computer hardware architecture and software systems, and the ability to use development principles in the design, implementation and evaluation of software to meet specifications of varying complexity.

(c) An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs

(k) An ability to apply design and development principles in the construction of software systems of varying complexity.

1. The ability to perform effectively to solve a problem as a member of a team.

(d) An ability to function effectively on teams to accomplish a common goal

1. Knowledge and appreciation of professional standards and ethical, legal, security and societal issues in computing, with the ability to analyze the impact of computing practices on society.

(e) An understanding of professional, ethical, legal, security and social issues and responsibilities

(g) An ability to analyze the local and global impact of computing on individuals, organizations, and society

1. The ability to communicate effectively, orally and in writing.

(f) An ability to communicate effectively with a range of audiences

1. Recognition of the need to pursue life-long professional development, and an ability to update practices and skills to remain current in computing.

(h) Recognition of the need for and an ability to engage in continuing professional development

(i) An ability to use current techniques, skills, and tools necessary for computing practice.

**STUDENT LEARNING OBJECTIVES (SLO)** - Upon completion of this course, the student will:

1. be able to write and solve algorithms involving the basic abstract data structures:

stacks, queues, lists, and trees.

2. be able to develop algorithms

3. be able to write sorting, searching programs

**EXPECTED STUDENT OUTCOMES:** Students will be required to complete:

o Write one final program covering all concepts using C++ (**SLO *1 – 3, PO a, b, c***)

o Quizzes, Homework, Tests, Laboratories (***SLO 1 – 3, PO a, b, c***)

**Grading Policies**

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| --- | --- |
| **Item** | **Points** |
| Lab/Projects/homework/Quizzes | 200 |
| Midterm | 100 |
| Final | 100 |
| Total | 400 |

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| --- | --- | --- |
| **Grade** | **Grade Scale** | **Points** |
| A | 90% | 360+ |
| B | 80% | 320+ |
| C | 70% | 280+ |
| F | 59% and below | below 275 |

COURSE OUTLINE

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| --- | --- |
| **Chapter** | **Topic** |
| 1 | Review and Big O notation |
| 5 | Linked list |
| 6 | Recursion |
| 7 | Stacks |
| 8 | Queues |
| 9 | Search Algorithms |
| 10 | Sorting Algorithms |
| 11 | Binary Trees |
| 12 | Graphs Algorithms |

**Course Policies:**

1. Late homework will be given zero.
2. No make-up quizzes/exams will be allowed without prior arrangements being made.
3. Do not ask questions such as "How do you solve Problem X?" Explain what you have done and ask a specific question in that context.
4. To appeal a grade, send an e-mail to your instructor's e-mail address within two weeks of the grade having been received. Overdue appeals will not be considered.

**Important Reminders from the Bowie State University Administration**

Students who have a disability and want accommodations should report immediately to **Disability Support Services** (DSS), located in Room 079 in Thurgood Marshall Library or call Dr. Michael S. Hughes, DSS Coordinator, at 301-860-4067.

Please take your **English Proficiency Examination** as early as possible! After completing ENGL 101 and ENGL 102, students must take and successfully pass the Bowie State University English Proficiency Examination. Transfer students who completed their English composition requirements at another university should take the English Proficiency Examination during their first semester of enrollment at the University.

In case of **inclement weather conditions**, call the following number regarding cancellations:

(301) 860-4000 or check online at www.bowiestate.edu.

Students who are not registered for this course will not receive a grade.

**Academic Dishonesty**: Academic dishonesty includes plagiarism, cheating, and other illegal or unethical behaviors in doing the work of the course. Plagiarism is the act of representing another’s ideas, words or information as one’s own. If you receive assistance on an assignment from someone else, you must avoid plagiarism by giving proper credit for this assistance. Include in your assignment a comment naming the person who assisted you and stating what the assistance was. Students who are guilty of academic dishonesty are subject to severe penalties ranging from a reduction in points (and possible failure) for the assignment/project, to failing the course, or in extreme cases, dismissal from the University. Do not copy other student’s projects, codes, and design. A group of students working together on a project must change their forms and codes to differentiate from others.