Course: CIS 250 Data Structures

Credit: 4 Quarter Hours   Method of Delivery: Classroom/Flex

Course Description: This course investigates various data representation techniques. Topics include data structures such as the stack, queue, linked list, and binary tree. Students will apply various search and sort techniques and determine when each is appropriate. A lecture period will be followed by instructor-assisted lab time to provide students with hands-on learning experience.

Prerequisite: CIS 155 Java Programming

Text(s) & Manual(s): Michael T. Goodrich, Roberto Tamassia. *Data Structures and Algorithms in Java, 5th Edition.* Wiley Press. ISBN-13: 978-0-470-38326-1 – Gaddis. *Starting out with Java: From Control Structures through Objects* (5th Edition). Addison Wesley, 2012. ISBN-10: 0132855836. ISBN-13: 978-0132855839

Materials needed for this course:
    Additional Supplies: USB Flash Drive (at least 1 gigabyte) (OPTIONAL)

Topics: Topics include data structures such as stack, queue, linked list, and binary tree. Students will learn to implement various search and sort techniques and determine when each is appropriate. A lecture will be followed by instructor-assisted lab time to provide students with hands-on learning experience.

Learning Objectives: Upon completion of this course, the student will be able to:
1. Create arrays, stacks, and queues
2. Generate linked lists and doubly-linked lists
3. Produce binary trees and other tree data structures
4. Analyze and choose appropriate data structures for specific problems
5. Define common algorithms, their efficiency, and their implementation (sorting, searching, graph processing)
6. Select appropriate algorithms for specific problems
7. Construct recursive algorithms

Midstate Grading scale:

90 - 100   A
80 - 89   B
70 - 79   C
60 - 69   D
 0 - 59   F

Midstate Plagiarism Policy:
Plagiarism is using another person's words, either by paraphrase or direct quotation, without giving credit to the author(s). Plagiarism can also consist of cutting and pasting material from electronic sources by submitting all or a portion of work for assignment credit. This includes papers, computer programs, music, sculptures, paintings, photographs, etc. authored by another person without explicitly citing the original source(s). These actions violate the trust and honesty expected in academic work. Plagiarism is strictly against the academic policy of Midstate College. Its seriousness requires a measured, forceful response which includes consequences for inappropriate and/or no citation.

In courses containing writing assignments, the College promotes the use of an electronic resource which compares the student's writing against previously submitted papers, journals, periodicals, books, and web pages. Students and instructors can use this service to reduce the incidence of plagiarism. This electronic

resource has been found to conform to legal requirements for fair use and student confidentiality. It is able to provide a report to the student indicating the parts of the assignment that match.

Student Success:

The Office of Student Success is available to students seeking tutoring for individual classes or who need assistance with writing assignments. Information is also available on test taking techniques, how to take notes, developing good study skills, etc. Contact Student Success in Room 217 (in person); (309) 692-4092, extension 2170 (phone); studentsuccess@midstate.edu (email).

Policies & Procedures:

1. Participation Requirements: Part of the Assignment grade will include class participation.
2. Assignments: Homework must be submitted at the beginning of class on the date which it is due. Late homework will be accepted only when special circumstances are approved by the instructor.
3. Exams: Exams must be taken on the dates scheduled by the instructor. The student will receive no points for an exam if it is not taken on the scheduled date, unless the student has received approval from the instructor due to special circumstances such as illness or extreme hardship. Make-up exams must be taken in the testing center. It is the student's obligation to make the appropriate arrangements to have a test administered.
4. Attendance: Regular attendance is expected. It is the student's responsibility to notify the instructor when a class will be missed. If you know of a conflict ahead of time, you should plan accordingly and submit assignments early.
5. Integrity: Plagiarism and cheating are serious offenses and may be punished by failure on exam, paper or project; failure in course; and/or expulsion from the college. For more information refer to the "Academic Dishonesty" policy in the student handbook.

Instructor:

Mark Webb
Email: mdwebb@midstate.edu
Office Hours: By Appointment (student arranges)

Methods of evaluating student performance:

Point Scale:
1. Quizzes: 10 points each (total: 100)
2. Homework: 40 points each (total: 400)
3. Mid-term: 250 points
4. Final: 250 points

Grading:
There will be a TOTAL of 1,000 points available (200+300+250+250=1,000)
1. 900-1000 = A
2. 800-899 = B
3. 700-799 = C
4. 600-699 = D
5. < 600 = F

Instructor Expectations

- This class will consist of 12 classes. And the instructor expects each student to show up for all classes.

- The instructor expects the student to let him know if they are having any problems within the class and related Chapters. The instructor is here to answer the student's questions and assist them. If the student does not understand what is covered in class and courseware, PLEASE let the instructor know.

Penalties for turning in late assignments without prior approval from the instructor:

(ALL homework is due the following week)

- One Week Late = 10%
- Two Weeks Late = 25%
- Three or More Weeks Late = 50%

Guidelines for completing homework and lab assignments:

1. All assignments must conform to the rules outline on that assignment.
2. Work must correctly answer questions or must clearly show that you completed the assignment.
3. If you have any questions about an assignment, please ask before the work is due.
4. Students are expected to take all exams when administered. Make-up exams are a privilege granted at the discretion of the instructor.
5. You may get help from the instructor or other students.
6. You may not copy another student's work either in whole or in part.
7. If you are in doubt the help you are giving is permissible, ask!
8. Plagiarized assignments are given a grade of "0" with no opportunity to resubmit the assignment. (see Midstate's plagiarism policy)
   a. This class grades each student on an individual basis. Because of this the instructor expects each student to do their own work.

Attendance policy for the class:

- If you miss 20% of the quarter, your final grade will be lowered one letter grade (an "A" becomes a "B")
- If you miss 30% of the quarter or more of the semester, your final grade will be lowered 2 letter grades (an "A" becomes a "C")
- We will be meeting 10 times, i.e.; 2=20%, 3=30%

Low Attendance:

(***From the student handbook***)
"Attendance in the first two weeks is critical to successful completion of any course. Therefore, if a student misses any class in weeks 1-2 of the quarter, they will be marked as a student in jeopardy."
I will turn in attendance WEEKLY to the main office.

General "in-class" policies:

- Cell phones should be silent (off or set to vibrate).
- If necessary, take phone calls outside of the class, away from the classroom door.
- The instructor reserves the right to answer any cell phones that disturb class.
- Students engaging in disruptive behaviors such as surfing the Internet, Chat, IM or any other activity during lecture will have their score reduced on the exam over this material by 10%.

TENTATIVE COURSE SCHEDULE

Week	Chapter	Topic	Objectives	Assignment Due following week
1	DSA 2	Object Oriented Design	Review from CIS 155	
2	JAVA 11	Exceptions and Advanced File I/O (JAVA)	Review from CIS 155	
3	JAVA 11	Exceptions and Advanced File I/O (JAVA)	Review from CIS 155	
4	JAVA 12 DSA3	A First Look at GUI Applications (JAVA) 3.1-Using Arrays(DSA)	7. construct recursive algorithms	
5	JAVA 12 DSA 3	A First Look at GUI Applications (JAVA) 3.1-Using Arrays(DSA)	1. Create arrays, stacks, and queues.	Study for midterm exam.
6	**Midterm Exam**			
7	JAVA 13 DSA 5	Adv. GUI Apps (Java) 3.2 Singly Linked Lists (DSA)	2. Create linked lists and doubly-linked lists	
8	JAVA 13 DSA 5	Adv. GUI Apps (Java) 3.2 Singly Linked Lists (DSA)	1. Create linked lists and doubly-linked lists	
9	JAVA 14	Applets & More (Java)	1. Create arrays, stacks, and queues.	
10	JAVA 15 DSA 3.5	Recursion (Java) Recursion (DSA)	5. Describe common algorithms, their efficiency, and their implementation (sorting, searching, graph processing)	
11	JAVA 15 DSA 9	Recursion (Java) Hash Tables, Maps, and Skip Lists (DSA)	3.Create binary trees and other tree data structures	Study for final exam.
12	**Final Exam**			