

Oakton Community College
CSC 255 *Objects and Algorithms*
Course Syllabus - Spring 2009

I ***Instructor Information***

Instructor Name: **Professor James Papademas**
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II ***General Course Information***

Meeting Time and Place: Online Course Delivery
Credit Hours: 3 Credit Hours Lecture / 1 Credit Hour(s) Lab
Course Description: This course surveys introductory algorithms in programming languages. Object - oriented methodologies are used to implement algorithms that exhibit backtracking, divide and conquer, the greedy method and branch and bound techniques. Time and memory complexity are analyzed using discrete metrics.
Course Prerequisite(s): CSC 240 or CSC 241 and either MAT 143 or instructor's consent.

III ***Required Instructional Materials***

Course Textbook(s): **Applied Data Structures with C++**, by Peter Smith, Jones and Bartlett Publishers, 2004.
ISBN: 0 - 7637 - 2562 - 5
Supplemental Materials: Includes handouts and special project information.
Course Companion Web Site: <http://www.jbpub.com/catalog/0763725625>
Computer Science Program: <http://www.oakton.edu/acad/dept/mcs/csc>
Lecture / Lab Notebook: You are required to purchase a bound notebook with dividers that will be used to bind your completed homework / lab assignments.
Other Items: Computer Thumb drive, folders, pens, pencils, mini - stapler are required.
Hand - Held Calculator: A hand - held scientific or graphing calculator is required along with the instructional manual of the calculator.

IV ***Course Objectives***

Key Objectives: This course should enable the student to:
(A) Continue the development of object - oriented programming methodologies.
(B) Analyze algorithmic complexity using discrete mathematical metrics.
(C) Implement algorithms using a variety of abstract data types.
(D) Study and implement sorting and searching algorithms.
(E) Study and implement elementary semi - numerical algorithms.
(F) Survey introductory distributed algorithms.

V ***Outline of Course Topics***

Topics of Discussion:
(A) Lists, sets, stacks and queues.
(B) Array - based structures.
(C) Binary, tries, and ternary search trees.
(D) Internal and external sorting.
(E) Graphs and maps.
(F) Indexed files and grid file organization.
(G) Big - O analysis and recursion.
(H) Algorithm analysis.

VI *Methods of Evaluating Student Progress*

Grading Scale: Grading will use the scale: 100 % to 90 % is an A (Superior), 89 % to 80 % is a B (Good), 79 % to 70 % is a C (Fair), 69 % to 60 % is a D (Poor) and 59 % to 0 % is an F (Failing).

Grade Determination: Your final course grade will be based on the following: Homework 20 % , Midterm Exam 30 % , Laboratory Projects 30 % , Final Exam 20 % .

Grade Breakdown: Homework Assignments are issued on a bi - weekly basis. The Midterm Exam generally covers material from the first half of the semester. Laboratory Projects are to be unique, original and submitted in a professionally manner. The Final Exam is cumulative.

VII *Methods of Instruction*

Instruction Techniques: The methods used to instruct the course material may include: (1) Online presentation, (2) Group discussion, (3) Individual and group projects and (4) Discovery or the Socratic method of asking questions.

VIII *Course Practices Required*

Student Practices: Students enrolled in this class should (1) read the course textbook regularly, (2) complete assignments on time and (3) demonstrate assigned problems.

IX *Academic Integrity*

Integrity Policy: The very nature of higher education requires that students adhere to accepted standards of academic integrity. Therefore, Oakton Community College has adopted a code of Academic Integrity. These may be found in the student Handbook. You may also find a summary of the code of Academic Conduct in the college Catalog. Among the violations of academic integrity listed and defined are: cheating, plagiarism, falsification and fabrication, abuse of academic materials, complicity in academic dishonesty, falsification of records and official documents, personal misrepresentation and proxy, and bribes, favors, and threats. It is the student's responsibility to be aware of behaviors that constitute academic dishonesty. Pursuant to the due process guarantees contained in the policy and procedures on Student Academic Integrity, the minimum punishment for the first offense for a student found in violation of the standards of academic integrity is failure in the assignment. In addition, a disciplinary record will be established and kept on file in the office of the Vice President for student Affairs for a period of 3 years.

X *Other Course Information*

Additional Items of Note: (a) You are responsible for all the course material. (b) Changes to this syllabus may be made when deemed appropriate and without notice. (c) Tutors are available by appointment in room 2400.

If you have a documented learning, psychological, or physical disability you may be entitled to reasonable academic accommodations or services. To request accommodations or services, contact the ASSIST office in the Instructional Support Services. All students are expected to fulfill essential course requirements. The College will not waive any essential skill or requirement of a course or degree program.

Tentative Weekly Outline of Course Computer Laboratory Topics / Projects

| Week | Chapter | Course Topics |
|-------------|----------------|---|
| 1 | 1 | Review of Object - Oriented Programming |
| 2 | 1 | Programming with Objects |
| 3 | 2 | Review of Lists and Arrays |
| 4 | 2 | Lists and Strings |
| 5 | 3 | Sets |
| 6 | 3 | More on Sets |
| 7 | 4 | Stacks and Queues |
| 8 | 4 | More on Stacks and Queues |
| 9 | 7 | Graphs and Circuits |
| 10 | 7 | Graphs and Circuits |
| 11 | 9 | Sequential File Processing |
| 12 | 9 | Files and Objects |
| 13 | 10 | Sorting Techniques |
| 14 | 10 | Searching and Sorting |
| 15 | All | Review for Final Exam |