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| **CS244: Object-Oriented Programming and Design**  **Department of Physics and Computer Science**  **COURSE SYLLABUS** | | | |
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| Instructor: | Dr. Shermane Austin | Term: | Spring 2018 |
| Office:  Phone: | AB1/C-16  718-270-6038 | Days and Times: | Tu, Th 10:00AM – 11:40AM |
| E-Mail: | shermane.austin@gmail.com | Class Location: | AB1 Building, C09 |
| Office Hours: | TuTh 12:00PM – 1:30PM | Website: | Blackboard |
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# Welcome!

Welcome to Object-Oriented Programming and Design.

# University Course Catalog Description

This course presents an object-oriented approach to software development used in large-scale programming projects. A software engineering methodology, such as the Unified Modeling Language (UML), will be used for object, dynamic, and functional modeling. Students learn how to implement a system using an appropriate object oriented programming language. Programming topics include: Classes and data abstraction, operator overloading, inheritance, virtual functions and polymorphisms, templates, exception handling, and class libraries including GUI applications.

# This course fulfills the following General Education Requirements: 🞎 Yes  No

🞎 Foundation Cluster 🞎 Required Core

🞎 General Knowledge Cluster 🞎 Flexible Core

**College Option:**

Socio-Cultural, and Diversity Cluster 🞎

Integrated Knowledge Cluster: 🞎 Social Sciences

🞎 Humanities & the Arts

🞎 Natural Sciences & Mathematics

# Course Overview

This course is an extension of the CS 151 course. It focuses on problem-solving with fundamental programming concepts. Topics include: algorithmic problem solving, iteration with arrays and functions, testing, sorting and simple searching, structures, recursion, object-oriented programming and design and an introduction to the STL classes: stacks and queues.

# Course Objectives / Student Learning Outcomes (SLOs)

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

* Demonstrate proficiency in the use of programming constructs (sequence, conditionals, and repetition), basic data types, string data types, arrays and structures.
* Understand and implement basic sorting and searching methods.
* Understand dynamic allocation
* Design and implement a class, clearly identifying its data and its functionality
* Understand and demonstrate the concepts of object-oriented design, inheritance, polymorphism, and information hiding.
* Design modular programs using an object-oriented programming paradigm
* Understand and implement basic recursive functions
* Solve problems with basic data structures such as stacks and queues

# Course Prerequisites

CS151 Introduction to Computing

# Course Credits

3 credits; 3 class hours.

# Required Texts and Materials

Textbook:

Starting out with C++ from Control Structures through Objects

# Supplementary (Optional) Texts and Materials

<http://www.cplusplus.com/doc/tutorial/>

# Basis for Final Grade

Course grades will be based on the following:

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| --- | --- | --- | --- |
| **Assignment** | **Number** | **Points each** | **Total** |
| Homework | 10 | 15 | 150 |
| Quizzes | 10 | 15 | 150 |
| Programming Projects | 15 | 20 | 300 |
| Exams - #1-#2 | 2 | 75 | 150 |
| Final Exam | 1 | 150 | 150 |
| **Total Points** | | | **900** |

The final grade will be a letter based on the following table:

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| --- | --- |
| **Total Points Earned** | **Letter Grade** |
| 830+ | A |
| 800-829 | A- |
| 770-799 | B+ |
| 731-769 | B |
| 700-730 | B- |
| 600-699 | C |
| 500-599 | D |
| Below 599 | F |

*An A+ grade can be earned by completion of extra-credit assignments.*

# Grade Dissemination

Grades for all exams, quizzes and assignments will be published in Blackboard.

# Course Policies: Grades

**Late Work Policy**: There are no make-ups for missed assignments, quizzes, or exams. Late work submissions will be assessed a penalty of 10% for each day after the deadline.

**Grades of Incomplete (INC)**: An “INC” grade is given when the student is doing passing work during a semester and who, for a verifiable reason, has not been able to complete a final programming assignment or misses a final exam. Check the College catalog for further information regarding INC grades.

# Course Policies: Technology and Media

Computers and other electronic devices can only be used to access lecture materials. Students are not to work on other materials in class.

Students are required to check email and blackboard with regularity to check for class information and announcements.

# Course Policies: Student Expectations

**Attendance Policy**: All students have the responsibility to arrive on time, attend class regularly, and to participate fully in the work of the course. Students who miss class are responsible to find out what was discussed and learn the material that was covered on the missed day(s). The instructor is not responsible for teaching missed material under any circumstances.

Assigned readings, problems and programs should be completed before class. Programs/projects will be assigned to reinforce the concepts presented in class. Students are encouraged to complete these assignments in the Computer Science Lab, AB/C-16. Note the college has extended open lab hours for Computer Science students.

**Honor Code and Plagiarism (Cheating)**: Students are required to sign and adhere to the departmental honor pledge. Check with the department for a copy of the pledge.

*EXAMS AND QUIZZES*

Cell phones or any other electronic devices cannot be used during exams and quizzes. Any form of cheating during an exam or quiz will cause immediate removal from the exam and a grade of zero.

*HOMEWORK ASSIGNMENTS*

Unless otherwise specified, homework assignments are to be completed individually. Discussions with other people about how to solve the problem, strategies, or problems that might arise, are permitted. However, each person should write his/her own programs independently.

Do not, under any circumstances, copy another person's code. Incorporating someone else's code into your program in any form will be considered plagiarism and therefore a violation of academic regulations. You must be prepared to explain any program code you submit. When a student is unable to explain the working of a piece of code that he/she submitted, no credit will be given for the homework. At the discretion of the professor, the action might be reported to the Department and the Office of Student Affairs.

**Disability Access**: Any student who may require accommodations due to a disability must be registered with the Office of Services for the Differently-Abled and notify the instructor at the start of the semester.

# Important Dates to Remember

Check the official academic calendar from the Office of the Registrar for special dates such as last day to add/drop classes, withdrawal deadline, closings, breaks, and examinations. Notice that the exam dates can be changed at the discretion of the professor.

# Schedule

The schedule, together with assignments, is subject to change in the progress of the course. Some topics might take longer than the time allocated. Announcements made in the class and on the website/blackboard/email override the schedule in case of conflicts.

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| **Week** | **Topics** |
| 1-2 | Algorithmic Problem Solving: iteration, control, functions and 1D arrays |
| 3 | Working with 2D arrays; Using assert function for testing |
| 4 | Simple searching and sorting: selection sort, binary search |
| 5 | Structures |
| 6-7 | Classes and Objects: Defining, Attributes, Member Functions, Constructors |
| 8 | More OOP – Passing Arguments to Constructors; Access and Mutator Functions; Public and Private member functions |
| 9 | More on Constructors; Operator Overloading, Friend Functions, const member functions |
| 10 | Inheritance, Polymorphism and Virtual Functions |
| 11 | Pointers and Dynamic Arrays |
| 12 | Recursion |
| 13-14 | Introduction to STL classes: Stacks and Queues |