SOUTHERN MAINE COMMUNITY COLLEGE
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South Portland, Maine 04106
Department of Computer and Information Sciences

Title: Object Oriented Design and Programming
Credit Hours: 4
Lecture (or Lab): Lecture

Catalog Number: CSCI 160
Total Contact Hours: 60
Instructor: Anne G Applin, PhD

Contact Information:
Office Phone: 207-741-5778 (not Fall 2021)
Email: aapplin@smccme.edu

Book an appointment:
http://aapplin.youcanbook.me
Office Hours: on the Discord server.

Course Syllabus

Course Description

This course is an in depth treatment of the concepts of object-oriented design and programming using Java. The Java language will be taught along with the concepts of object orienting programming. Design of programming solutions using UML is emphasized along with programming using designs provided by the instructor. Topics will include: classes and methods, branching and method design, loops and external files, arrays, collections, recursion and object oriented software engineering. Most of these topics are designed to enhance your problem-solving and logical reasoning abilities. Lots of hands on activities. Prerequisite: Successful completion of CSCI 110 Introduction to Computer Science.

Course Objectives

Students completing this course will be able to solve computable problems using the Java programming language.

After successfully completing the course, the student will be able to:

1. Demonstrate the ability to design object-oriented solutions to computable problems using classes, objects and UML
2. Demonstrate the ability to code well designed UML problem solutions using the Java programming language.
3. Select appropriate algorithms to solve well-formed problems
4. Implement non-recursive algorithms in Java
5. Implement recursive algorithms in Java

Communication is key: Communication with the instructor when you are running late or are unable to attend makes the difference between being allowed to hand in work late or not.

"A lack of planning on your part does not constitute an emergency on my part."

Learning Objectives (from ACM/IEEE curriculum) for CSCI 160

- Implement basic numerical algorithms. [Usage]
- Implement simple search algorithms and explain the differences in their time complexities. [Assessment]
- Classify common input validation errors and write correct input validation code. [Usage]
- Demonstrate the identification and graceful handling of error conditions. [Usage]
- Describe the purpose of cryptography and list ways it is used in data communications. [Familiarity]
- Define the following terms: cipher, cryptanalysis, cryptographic algorithm, and cryptology, and describe the two basic methods (ciphers) for transforming plain text in cipher text. [Familiarity]
- Use subclassing to design simple class hierarchies that allow code to be reused for distinct subclasses. [Usage]
- Explain the relationship between object-oriented inheritance (code-sharing and overriding) and subtyping (the idea of a subtype being usable in a context that expects the supertype). [Familiarity]
- Use object-oriented encapsulation mechanisms such as interfaces and private members. [Usage]
- Write event handlers for use in reactive systems, such as GUIs. [Usage]
- Explain why an event-driven programming style is natural in domains where programs react to external events. [Familiarity]
- Define and use program pieces (such as functions, classes, methods) that use generic types, including for collections. [Usage]
- Discuss the differences among generics, subtyping, and overloading. [Familiarity]
- Determine whether a recursive or iterative solution is most appropriate for a problem. [Assessment]
- Implement a divide-and-conquer algorithm for solving a problem. [Usage]
- Apply the techniques of decomposition to break a program into smaller pieces. [Usage]
- Identify the data components and behaviors of multiple abstract data types. [Usage]
- Discuss the appropriate use of built-in data structures. [Familiarity]
- Describe common applications for each of the following data structures: stack, queue, and map. [Familiarity]
- Write programs that use each of the following data structures: arrays, records/structs, strings, linked lists, stacks, queues, and maps. [Usage]
- Apply a variety of strategies to the testing and debugging of simple programs. [Usage]
- Construct, execute, and debug programs using a modern IDE and associated tools such as unit testing tools and visual debuggers. [Usage]
- Construct and debug programs using the standard libraries available with a chosen programming language. [Usage]
- Analyze the extent to which another programmer's code meets documentation and programming style standards. [Assessment]
- Apply consistent documentation and program style standards that contribute to the readability and maintainability of software. [Usage]

Topical Outline of Instruction

Week	Topic	Learning Activity (Exercises & Labs)	Exam	Projects
1	Review of Java, File I/O, and NetBeans Configurations	zyBooks Reading: 7.1-7.5 zyLab 7.8 and Lab: File I/O and more		
2	Multidimensional Arrays Review 1-D material if you need to.	zyBooks Reading: 5.9-5.10 Lab: Image Lab & Image Homework		
3	Objects and Classes	zyBooks Reading: 9.1-9.11 Lab: Buggy Blackjack - debugging		1
4	Objects and Classes	zyBooks Reading: 9.12-9.22 Lab 4: Agility Competition V1 zyLabs: 9.23 – 9.28		
5	Memory Management	zybook Reading: 10.1 – 10.6 zyLabs: 10.7 – 10.11 Lab5: Agility Competition V2 Optional Lab: LinkedLists		2
6	Inheritance	zyBooks Reading 11.1 – 11.6 Lab5: Agility Competition V3		
7	Inheritance and Polymorphism	zyBooks Reading 11.7 – 11.11 zyLabs 11.14 – 11.18	Exam 1	
8	Java Generics	zyBooks 12.1 – 12.3 zyLabs 12.5 – 12.6 Lab: Java Generics		3
9	Exceptions & Responsible Coding (not in text)	zyBooks Reading 8.1 – 8.5 zyLabs: 8.6 Some Readings and exercises are on Brightspace Lab: Cryptography		
10	Collections: Maps & Sets	zyBooks Reading: 13.1 – 13.6 zyLabs: 13.7 – 13.9 Lab: Maps and Sets		
11	Recursion	zyBooks Reading: 14.1 – 14.9 zyLabs 14.10-14.11		4
12	Searches and Sorts	zyBooks Reading 15.1 – 15.4		
13	Searches and sorts	zyBooks Reading: 15.5 – 15.9 zyLabs: 15.10 – 15.11 Lab: Efficiency of Searches and Sorts		
14	Graphical User Interfaces	zyBooks Reading: 16.1 – 16.11 Lab a GUI tutorial		
15	More GUIs Review and catch up			5
16	Final Exam		Final	

** All Learning activities and Projects are due Sunday of the indicated week at 11:59 pm
Check Brightspace for dates.

Course Requirements

Students will create 5 large individual programming projects, take 1 test online and complete a comprehensive final examination. Projects will involve computation, manipulation of data as well as using built-in Java data structures. Students should expect to spend 14-16 hours per week outside of class on reading assignments and programming

problems. You should schedule several 2-hour blocks of time during the week. Sometimes you won't need them all, but most weeks you will need all that time. It's easier to manage your time if you plan for the worst case.

Student Evaluation and Grading

Participation Exercises (zyBooks)	10%		Weekly Discussions (Brightspace)	10%
Labs & ZyLabs	15%		One Midterm Exam	25%
Programming Projects (Brightspace)	15%		Comprehensive Final Exam	25%

Grading Scale:

93 – 100	A	80 - 82.99	B-	67 - 69.99	D+
90 - 92.99	A-	77 - 79.99	C+	63 - 66.99	D
87 - 89.99	B+	73 - 76.99	C	0 - 62.99	F
83 - 86.99	B	70 - 72.99	C-		

Exams – *All exams are cumulative*. You are responsible for knowing all of the material in the prerequisite course in addition to the material covered in this course. You will be allowed to create and use a set of notes during exams including the final. This is to help you study and to make finding things easier. You will not have time to dig through a book and will not have access to Google.

Remote Proctoring of Online Exams

This course requires the use of the remote proctoring software for online exams. The student will need a webcam for Remote Proctoring. The Remote Proctoring service will record the student while taking an exam. When taking an online exam, follow these guidelines:

- Select a location where the student won't be interrupted
- Take bathroom breaks prior to starting the exam.
- Before starting the test, know how much time is available for it, and allotted sufficient time to complete it
- Turn off all mobile devices, phones, etc. and don't have them within reach
- Clear the area of all external materials — books, papers, other computers, or devices
- Remain at desk or workstation for the duration of the test
- The Proctoring software will prevent you from accessing other websites or applications; you will be unable to exit the test until all questions are completed and submitted
- You should install GeniusScan or a similar software on your phone so that you can create PDF documents from handwritten pages for partial credit or questions that require it.

Programming Projects - You should start on a programming project as soon as it is assigned. Do not expect to do these in one sitting. You should write projects in small testable pieces. Unit testing of all classes is required. Complete JavaDoc for all classes and methods is required. Projects are due by 11:59 pm Sunday of the indicated week. There is no Extra Credit and no extra work that can be done to enhance your grade.

Labs, zyLabs, and zyBooks Activities: zyBooks Participation Exercises, Challenge Exercises, and zyLabs can all be worked on over time until you finish them correctly as long as you do that before the due date. Earning 80% of the points on those activities gets you full credit for the activity, but of course doing everything assigned will give you more practice and a better understanding. Instructor written labs give you even more experience with text concepts and things that the text doesn't cover or doesn't cover the way I want them covered.

Late Assignments: Each student will have 7 "free" late days that can apply to Projects. Use them carefully. You must tell me that you are using late days when you submit a project. Projects that are handed in with some level of functionality before the due date or using some late days, may be resubmitted after they are graded the first time. **Labs will not be accepted more than 5 days late.**

Text, Tools and / or Supplies

We will be using an interactive textbook that you will subscribe to from Brightspace. The subscription price is $77 which is much less than a computer science textbook, but If you were in CSCI110 last semester your text should be $48 and if you failed CSCI160 last semester your subscription this semester will be free. You should contact zyBooks support in either case. You can purchase a full subscription code at the bookstore or subscribe directly using a credit card. You should have a notebook for taking notes and a writing instrument handy when watching lectures. It is strongly recommended that the student have a USB drive to store backup copies of all programming assignments. **Backing up your projects is your responsibility – hard drives crash at the most inconvenient times**.

Attendance Policy: Attendance on time for each class is expected. For online students, attendance is logged using your activity on Brightspace. For Hybrid courses, your attendance in the Zoom classroom is required. You **do not** have to show video of yourself in the class for the full lecture time, but I would like to see faces at the beginning of a meeting and you will be required to answer questions in the chat to show that you are paying attention. If you don't answer a question asked during class and have your video turned off, I will mark you absent for that meeting.

End-of-Course Evaluation

Students complete evaluations for each course attended at SMCC. Evaluations are submitted online and can be accessed through the student portal. Students can access the course evaluations beginning one week before the end of classes. The deadline for submission of evaluations occurs Monday at 5 p.m. following the last day of the class. You will receive an e-mail to your student e-mail account when course evaluations are available.

For Classes with any Face- to -Face Component

While the syllabus represents current plans, there may be changes during the semester in response to the on-going Covid-19 pandemic. Depending on the progression of the virus, it is possible that the College may have to suspend face-to-face instruction for part of the semester. If we must stop face to face instruction anytime during the semester, your instructor will contact you via your SMCC email or the Brightspace course homepage to discuss next steps for the course.

ADA Statement

Southern Maine Community College is an equal opportunity/affirmative action institution and employer. For more information, please call (207) 741-5798. If you have a disabling condition and wish to request accommodations in order to have reasonable access to the programs and services offered by SMCC, you must register with the Disability Services Coordinator, Sandra Lynham, who can be reached at 741-5923. Further information about services for students with disabilities and the accommodation process is available upon request at this number. Course policies about online testing are modified to suit each individual's accommodations.

The Learning Commons:

The library, tutoring and writing centers, and reference/research assistance (typically located on the second floor of South Portland's Campus Center and in the Midcoast's LL Bean Learning Commons and Health Science Center) will be fully available online during the **fall 2021** semester.

Here you can find free academic support through individually scheduled and drop in, online tutoring. You can also find information literacy/research librarians, and professional academic strategy/planning mentoring online. While the physical space of the Learning Commons will be available at this time, we can also work with you to set up zoom classrooms for small group study. Services are offered by appointment or as drop-in assistance.

To access services:

- Visit My Learning in My Maine Guide or
- Select the "tutoring needed or need help?" button if it appears inside your Brightspace course.

Whether On Site or Online, students have consistently reported that the Learning Commons is a friendly, risk-free, and helpful place to seek academic support. It has also been shown that those who make use of the Learning Commons do better in a course than those who do not. We strongly encourage you to take advantage of this valuable and enjoyable resource.

SMCC Pay-for-Print Policy

Each semester students receive a $20 printing credit. The balance resets at the end of the semester and any remaining credits are removed. The College's pay-for-print system monitors printing on all printers (including those in general access labs, library printers, Tutoring Services, Campus Center Lounge and technology labs). Be sure to log OUT of the system when you've finished your printing, to prevent unauthorized access to your account. Students can check the number of pages they have printed by using the Printing Balance tool available on SMCC computers (located in the lower right corner of the screen, near the clock). Departments with work study students who need to print documents for the department should contact the Help Desk at 741-5696 to have a special account set up. To find ways to reduce your printing charges, please go to the IT Help tab on My SMCC. If you have questions about the pay-for-printing policy or your printing charges, please contact the Help Desk at 741-5696 or send an e-mail to helpdesk@smccme.edu.

Refunds

Print jobs are eligible for a refund in the event of mechanical or electronic error on the part of the printer, print server, or software used to submit the job. Jobs are not eligible for a refund in cases where the job was not set up correctly, was submitted multiple times, or the student is not satisfied with the result. To request a refund, please bring the offending print to the IT Department in the basement of the Ross Technology Center. Refunds will be granted in the form of a credit to the student's account.

Add-Drop Policy

Students who drop a course during the one-week "add/drop" period in the fall and spring semesters and the first three days of summer sessions receive a 100% refund of the tuition and associated fees for that course. Please note any course that meets for less than the traditional semester length, i.e., 15 weeks, has a pro-rated add/drop period. There is no refund for non-attendance.

Withdrawal Policy

A student may withdraw from a course only during the semester in which s/he is registered for that course. The withdrawal period is the second through twelfth week of the Fall and Spring semesters and the second through ninth week of twelve-week Summer courses. This period is pro-rated for shorter-length courses,
Usually 75 percent of course meeting times; please check with the Registration Office. To withdraw from a course, a student must complete and submit the appropriate course withdrawal form, available at the Registration Office. This process must be completed either in person or by using SMCC e-mail accounts.

Plagiarism Statement

If an instructor suspects that a student has knowingly committed a violation defined in the Maine Community College System Policy on Student Grade Appeals and Academic Misconduct, the instructor has the authority to review the alleged misconduct and determine the grade that the student should receive for the assignment and the course. The instructor may assign a failing grade for the assignment or course and may require the student to complete additional work for the course. The instructor may consult with the department chair and/or the College's chief academic officer prior to making such decisions. If a student seeks to challenge an instructor's determination, the student should submit a grade appeal. Grade appeal forms are available in the Advising Office on the South Portland Campus or in the administrative offices in the Learning Commons on the Midcoast Campus. An instructor may also refer the matter to the College's disciplinary officer for review under the procedures of the MCCS Student Code of Conduct

CSCI 160 – Collaboration Policy

CLASSWORK / HOMEWORK / LABS

You may collaborate on CLASS WORK ASSIGNMENTS in and out of class. However, you must understand how to do the work independently. This means that you MAY work together to solve the problems from the zyBook or from the Instructor designed labs.

TESTS

No discussion of any kind with anyone but the instructor is allowed during a test. You are allowed one (1) standard page (8.5" X 11") of notes as an assistance sheet for each exam. You must have a webcam to take exams in this course. The video and audio must be on for the entire exam.

PROJECTS

Discussion of techniques in a natural language (such as English) is allowed. Discussion of an assignment in a computer or algorithmic language (such as Java) is NOT allowed. Strictly avoid sharing or exchanging literal statements of computer code or program files. Computer language questions are to be limited to the language and should not concern the assignment. WHEN IN DOUBT, SEE THE INSTRUCTOR! Stealing, giving or receiving passwords, code, designs, drawings, diagrams and/or text from ANY other person (whether from on-campus or off-campus) is NOT allowed. Every line of code that you turn in must be your own!

Any of the following also constitutes cheating:

1. Having a copy of a program that is not your own.
2. Accessing or viewing anyone else's work.
3. Giving anyone else access to your work including:
    a. Leaving printouts of your code in trash cans on campus,
    b. Posting project solutions to a public Git repository
    c. Posting project solutions to a homework site.
4. Any attempt to collaborate on projects.
5. Any attempt to deceive the instructor.

Student responsibilities include:

1. Secure disposal of code and report of missing printouts.
2. Avoidance of other students who act unethically.
3. Keeping your program solutions to yourself.

The Penalty

Violations of the collaboration policy will result in a zero on the assignment in questions and will be referred to the Disciplinary Committee for further action**. Violation can result in failure of the course.**

I have read and understand the syllabus and collaboration policy for CSCI160.

You will be asked to pledge that you have upheld this policy on every major programming assignment.