



South Portland, Maine 04106
Computer Science Program

Title: Principles of Computer Science

Catalog Number: CSCI 110

Credit Hours: 4

Total Contact Hours: 60

Lecture (or Lab): Lecture

Instructor: John DeSimone

Office Hours – Location:

Contact Information: jdesimone@smccme.edu

Course Syllabus

Course Description

This course will teach you how to design and write computer algorithms to solve a variety of problems using the Java programming language. Algorithms will be implemented as programs in Java. Topics include primitive data types and operations in Java, three types of control statements, methods, arrays and introduction of object-oriented concepts such as classes and encapsulation. Most of these topics are designed to provide students with tools that are useful when encountering computers in today's workplace. Furthermore, they are designed to enhance problem-solving and logical reasoning abilities. **Prerequisite:** Successful completion of MATH 050 or higher or placement into a math course at or above MATH 145

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. Create variables to hold values during program execution.
2. Demonstrate the ability to create functions to perform specialized tasks needed to solve problems.
3. Describe number systems and representation of data in the computer.
4. Demonstrate the ability to correctly sequence operations to solve computable problems.
5. Demonstrate the ability to correctly use loops and decision structures.
6. Demonstrate an ability to use arrays to solve appropriate problems.
7. Design and code solutions to computable problems using an appropriate computer language.
8. Troubleshoot programs of their own and those provided by the instructor for debugging purposes.
9. Implement non-recursive algorithms in Java

Learning Outcomes

This course seeks to develop the following core abilities:

Global Awareness / Diversity –

- Identify resources and strategies needed to problem solve and/or achieve goals inclusive of diverse perspectives and experiences.
- Demonstrate the ability to work collaboratively with people from diverse backgrounds in pursuit of a common objective or goal utilizing interpersonal skills that are essential to team building, conflict resolution and cross-cultural communication.

Critical Thinking –

- A student can interpret information logically by selecting and organizing relevant facts and opinions and identifying the relationships among them.
- A student can analyze an issue or problem by separating it into its component parts and investigating the relationship of the parts to the whole.
- A student can synthesize information by combining ideas from multiple sources to come to an independent conclusion.
- A student can evaluate information by making informed judgments as to whether the information is accurate, reliable or useful.
- A student can apply theory to practice.

Communications –

- Demonstrate a command of the English language
- Identify and extract relevant data from written and oral presentations

Quantitative Methods –

- Recognize problems that can be solved with quantitative methods
- Identify the quantitative components of a problem
- Select and appropriate mathematical method to solve a problem
- Demonstrate accurate computational and/or algebraic skills to solve a problem
- Estimate the reasonableness of answers to problems

Attendance Policy: Students will be dropped from the course with a grade of AF if they miss 3 consecutive meetings or a total cumulative number of classes equal to 2 weeks of class (4 class meetings). Attendance on time for each class is expected.

Cell Phones: Cell phones may not be used in this class. If you bring such equipment to the classroom, it must be turned to vibrate and put away before the class starts and stay that way throughout the class period.

Computer Use During Class: Use of email, Facebook, and games during class is prohibited. Use of such programs is distracting to those nearby and will not be tolerated.

Late Assignments: Labs are started in class, but should be finished on your own time. They are due at the start of **the next class period** and will not be accepted after 1 week of the original lab date. Projects lose 10% per day and will not be accepted after 7 days.

Topical Outline of Instruction

Week 1	<p><i>Ch 1 – Introduction to computers, programs, and Java</i></p> <ul style="list-style-type: none">- Programming- Basic output- Basic input- Comments and whitespace- Errors and warnings- Computers and programs- Computer tour- Language history- Problem Solving <p><i>Ch 2 – Variables / Assignments</i></p> <ul style="list-style-type: none">- Identifiers- Variables- Assignments- Named Constants- Arithmetic Expressions- Floating Point Variables- Integer Overflow- Numeric Data Types- Reading the API documentation- Debugging- Style guidelines and naming conventions
Week 2	<p>Lab01 – Introduction to NetBeans</p> <p><i>Ch 3 – Branches</i></p> <ul style="list-style-type: none">- Boolean data types- Relational and equality operators- Logical operators- if statement- if else- nested if else
Week 3	<p>Lab02 Errors and Lab03 Decisions</p> <p><i>Ch 4 – Mathematical Functions, Characters, and Strings</i></p> <ul style="list-style-type: none">- Methods of the Math class- Type conversions- The Binary number system- The Character class- Basics of the String Class- String comparisons- String Access operations- String modify operations- Random Numbers- Formatting output using printf()

Week 4	<p>Lab04 Strings</p> <p><i>Ch 5 – Loops</i></p> <ul style="list-style-type: none"> - Loop basics - While loops - More while examples - Counting with while loops - Do-while loop (input validation) - For loops - Nested Loops - Incremental Development
Week 5	<p>Lab05 - Loops</p> <p><i>Ch 6 – User-Defined Methods</i></p> <ul style="list-style-type: none"> - Method Basics - Parameters - Reason for methods - Methods with branch / loop
Week 6	<p>Lab 06 – void methods</p> <p>Exam 1 -- Chapters 1-5</p>
Week 7	<ul style="list-style-type: none"> - Unit Testing - How methods work - Common errors - Scope of variable / method definitions - Method overloading - Javadoc for methods <p>Lab07 – value returning methods</p>
Week 8	<p><i>Ch 7 – Arrays</i></p> <ul style="list-style-type: none"> - Array Concept - Arrays - Array iteration drill - Iterating through arrays - Arrays as parameters - Multiple arrays - Swapping two variables - Loop-modify/copy/compare array
Week 9	<p>Lab08 - 1-D Arrays Lab</p> <ul style="list-style-type: none"> - Two Dimensional Arrays - File Input and Output
Week 10	<p><i>Ch 8 – Objects and Classes</i></p> <ul style="list-style-type: none"> - Objects: Introduction - Classes: Introduction - Mutators, accessors, and private helper methods - Constructors - Constructor overloading - Unit Testing for classes
Week 11	<ul style="list-style-type: none"> - Objects and references - The ‘this’ implicit parameter - Introduction to ADT’s - Primitive and reference types. <p>Exam 2 – Chapters 1-7</p>
Week 12	<ul style="list-style-type: none"> - Introduction to the Java ArrayList. <p>Lab09 Classes and Objects</p>

Week 13	<ul style="list-style-type: none"> - Classes with classes - ArrayList ADT - Javadoc for classes - Parameters of Reference Types
Week 14	Lab 10 ArrayList of Objects Lab 11 Container Objects
Week 15	<i>Ch 9 – Recursion</i> <ul style="list-style-type: none"> - Recursion Introduction - Recursive methods - Recursive search - Tracing Recursion using the Box method
Week 16	Final exam in two parts.

Exam Policies: You will be allowed to create and use a one page assistance sheet during exams including the final. The single 8.5 X 11 inch piece of paper can have anything on front and back that you wish to have handy during exams. You may not give your assistance sheet to anyone else. Each student who wishes to use one must create her own.

Course Requirements

Students will create 6-7 individual programming projects, take 2 tests during scheduled class times and complete a comprehensive final examination in two parts given during the last week of class. Projects will involve computation, manipulation of data as well as searching and sorting arrays. Students should expect to spend 8-10 hours per week outside of class working on projects, homework and course preparation.

There are laboratory assignments that allow students to experiment with every programming construct covered in the lecture portion of the course. Labs are “initialed” either by the instructor or the tutors. Completed labs are due within 7 days of the day they are handed out.

The Challenge Activities, Participation Activities, and Lecture prepare the student to complete the labs. The labs prepare the student for the projects. A full understanding of the projects prepares the student for exams.

Student Evaluation and Grading

Two in-class tests	30%	Challenge Activities	10%
6-7 Projects	20%	Participation Activities	5%
Final Exam (Comprehensive)	25%	11 Labs	10%

Grading Scale:

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

Text, Tools and / or Supplies

Programming in Java an interactive textbook by Zybooks. Subscriptions can be purchased at the bookstore or online. Points will be given for participation activities and challenge activities completed in the text. Sign up at zybooks.com. Enter the zyBooks code SMCCCSCI110Spring2016. Click subscribe. The cost for the zyBook is \$48.00. Your subscription runs until May 28, 2016. Fifteen percent of your grade in this course will come from exercises in this book. Full points will be awarded for 85% correct completion on assigned activities by the due date.

You should have a notebook for taking notes and a writing instrument. It is strongly recommended that the student have a USB drive to store backup copies of all programming assignments.

End-of-Course Evaluation

In order to gain access to final course grades, students must complete evaluations for each course attended at SMCC. Evaluations are submitted online and can be accessed through the student portal site. Students can access the course evaluation report beginning two weeks before the end of classes. The deadline for submission of evaluations occurs 24 hours after the last day of classes each semester. Instructors will announce when the online course evaluation is available.

ADA (Americans with Disabilities Act):

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.

SMCC Pay-for-Print Policy

In an effort to control the escalating cost of supplies and to encourage students to conserve resources, SMCC charges for printing. Students receive a \$20 credit every semester. This credit resets for each semester and extra credit is not rolled over to the next semester. Per page costs are as follows:

- 8.5"x11" black and white: \$0.10 per page
- 8.5"x11" color: \$0.50 per page
- 8.5"x14" and 11"x17" black and white: \$0.20 per page
- 8.5"x14" and 11"x17" color: \$1.00 per page

Duplex (two-sided) pages are discounted 50% from the listed page costs.

Students can monitor their remaining credit and number of pages printed by visiting the IT Help tab on MySMCC or by checking the Printing Information icon in the lower right corner of the screen while logged in to an SMCC computer.

More information about the Pay-for-Print Policy is available on the IT Help tab on MySMCC.

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. To withdraw from a course, a student must complete and submit the appropriate course withdrawal form, available at the Enrollment Service Center (no phone calls, please). The designation “W” will appear on the transcript after a student has officially withdrawn. A course withdrawal is an uncompleted course and may adversely affect financial aid eligibility. Failure to attend or ceasing to attend class does not constitute withdrawal from the course. There is no refund associated with a withdrawal.

Plagiarism Statement

Adherence to ethical academic standards is obligatory. Cheating is a serious offense, whether it consists of taking credit for work done by another person or doing work for which another person will receive credit. Taking and using the ideas or writings of another person without clearly and fully crediting the source is plagiarism and violates the academic code as well as the Student Code of Conduct. If it is suspected that a student in any course in which s/he is enrolled has knowingly committed such a violation, the faculty member should refer the matter to the College’s Disciplinary Officer and appropriate action will be taken under the Student Code of Conduct. Sanctions may include suspension from the course and a failing grade in the course. Students have the right to appeal these actions to the Disciplinary Committee under the terms outlined in the Student Code of Conduct.

CSCI 110 – Collaboration Policy

CLASSWORK / HOMEWORK / LABS

You may collaborate on CLASS WORK ASSIGNMENTS in and out of class. However, your final answers MUST be YOUR OWN. This means that you MAY work together to solve the problems, but the final answers must be done INDEPENDENTLY. (You may NOT copy another person's work!)

TESTS and QUIZZES

No discussion of any kind with anyone but the instructor is allowed. Use of unauthorized written material, cell phones, or other messaging tools is not allowed.

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.
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 question and will be referred to the Disciplinary Committee for further action.

I have read, and understand the syllabus and collaboration policy for CSCI110.

PRINT Name (last, first, mi): _____

Signature: _____