**C O U R S E O U T L I N E**

**CS 151 Computer Science I**

**Fall Semester, 2022**

**2022/23 Catalog data:** First course in Computer Science. Introduces the fundamental concepts of computer programming with an object-oriented language with an emphasis on analysis and design. Topics include data types, selection and iteration, instance variables and methods, arrays, files, and the mechanics of running, testing and debugging.

**Prerequisites:** May be taken concurrently or Grade C- or better in (MATH 152 or MATH 217 or MATH 218) or placement test.

**Textbook**: John Lewis and William Loftus, Java Software Solutions, 9th edition, Pearson, 2017.

**Instructor**: Neli P. Zlatareva, Ph.D., Professor of Computer Science.

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 Office hours MW 12:05 p.m. – 1:30 p.m.

 TR 10:40 a.m. - 11:30 p.m.; 5:45 p.m.– 6:15 p.m.

**Course Objectives**: Having completed this course successfully, the student should

 - Understand the basic principles of object-oriented programming.

 - Design and debug Java programs using basic control structures (linear, iteration, and selection).

 - Define Java objects, methods and classes and use them in definite application settings.

 - Understand and utilize arrays and text files.

 - Learn how to solve non-trivial problems, and how to implement their solutions.

**NOTES:**

1. **NO CELL PHONES ALLOWED IN THE CLASSROOM.**
2. **THE USE OF PERSONAL COMPUTERS LIMITED TO CLASS ACTIVITIES.**
3. **CLASS ATTENDANCE IS A MUST FOR SUCCESSFUL COMPLETION.**

**Class topical outline and assignments for the week:**

Week 1 August 29 – September 2

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 | !!! NOTE: August 31st class will be held in a designated lab (tbd)|

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 - Introduction to computer systems and computer languages.

 - Binary numbers.

 - Assignments:

 \*) Read Sections 1.1, 1.2, 1.3.

 \*\*) Install jdk on your home computer. Download from http://www.oracle.com/technetwork/java/javase/downloads/index-jsp-138363.html

Week 2 September 6 - September 9

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 | !!! NOTE: September 7th class will be held in a designated lab |

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 - Introduction to Java language and Object-Oriented Programming.

 - Writing and running Java programs. Comments, identifiers and reserved words.

 - Character strings.

 - Assignments:

 \*) Read Sections 1.4. 1.5, and 1.6.

 \*\*) Do Self-Review Questions from Chapter 1.

 \*\*\*) Test your jdk installation by running provided on the course Web site

 examples to ensure that it works properly.

 \*\*\*\*) Review Lab 1 problems 1 and 2 (see course Web site).

Week 3 September 12 - September 16

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 | !!! NOTE: September 12th class will be held in the designated lab |

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 - Primitive data types. Variables.

 - The assignment statement and arithmetic operators.

 - Data conversion.

 - Assignments:

 \*) Start reading Chapter 2, and keep up with Self-Review questions from sections covered.

 \*\*) Do Lab 2 problems 1, 2, and 3.

Week 4 September 19 - September 23

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 | !!! NOTE: Both classes will be held in the designated lab |

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 - Introduction to objects, classes, class libraries and packages.

 - Interactive programs. The Scanner class.

 - Assignments:

 \*) Submit homework #1 (homeworks and deadlines are posted on BB)

 \*\*) Finish Chapter 2, and all Self-Review questions from Chapter 2.

Week 5 September 26 – September 30

 - Formatting output.

 - Wrapper classes.

 - Boolean expressions. Increment, decrement and logical operators.

 - Conditionals: if – else statements.

 - Assignments:

 \*) Study Chapter 3.1, 3.2, 3.3, 3.5, 3.6, 3.8

 \*\*\*) Do Self-Review Questions from sections covered.

Week 6 October 3 – October 7

 - Conditionals: switch statements.

 - Loops: the while statement.

 - Assignments:

 \*) Submit homework #2.

 \*\*) Do Lab 2, problem 4 and Lab 3, problems 1 and 2.

 \*\*\*) Study Sections 5.1, 5.2, 5.3, 5.4.

Week 7 October 10 – October 14

 - Loops continued: do and for statements.

 - Nested loops.

 - Assignments:

 \*) Do Lab 3 problems 3, 4, 5 and 6.

 \*\*) Do Self-Review Questions from Chapters 5 and 6.

Week 8 October 17 – October 21

 - More about JAVA classes. Writing user-defined classes and methods.

 - Assignments:

 \*) Submit homework #3.

 \*\*) Study Sections 6.1, 6.2, 6.3 and 6.4, and review Chapters 1, 2, 3, 5 and 6 (only sections

 covered) in preparation for Test #1.

 \*\*\*) Review class-related sections from Chapters 2 and 3.

Week 9 October 24 – October 28

 - Test #1.

 - Encapsulation and visibility modifiers.

 - Parameter passing.

 - Assignments:

 \*) Study Sections 4.1, 4.2, 4.3, 4.4, and 4.5

 \*\*) Do Self-Review Questions from Chapter 4.

Week 10 October 31 – November 4

 - Static variables and static methods.

 - Method overloading.

 - Dependencies among classes, and dependencies among objects of the same class.

 - Assignments:

 \*) Submit homework #4.

 \*\*) Study Sections 7.1, 7.2, 7.3, 7.4, 7.7, 7.8

Week 11 November 7 – November 11

 - Interfaces.

 - Enumerated types.

 - Assignments:

 \*) Study Sections 3.7, 7.5, 7.6.

 \*\*) Do Self-Review questions from Chapter 7 and review Chapter 4 to prepare for test #2.

Week 12 November 14 – November 18

 - Test #2.

 - Reading from a text file and writing to a text file.

 - Assignments:

 \*) Submit homework #5.

 \*\*) Study Section 5.5

Week 13 November 21 – November 22 (Thanksgiving break)

**Note: November 21 is the last day to withdraw from courses without permission**

 - Arrays of primitive types.

 - Assignment:

 \*) Study Sections 8.1 and 8.2.

Week 14 November 28 – December 2

 - Initializer lists.

 - Arrays of objects.

 - Command-line arguments.

 - Assignment:

 \*) Study Sections 5.6, 8.3 and 8.4

Week 15 December 5 – December 8

 - Dynamic arrays and multi-dimensional arrays.

 - Assignment:

 \*) Submit homework #6.

 \*\*) Study Sections 8.5 and 8.6.

 \*\*\*) Do Self-Review Questions from Chapter 8.

 \*\*\*\*) Prepare for the final exam. Review tests 1 and 2, quizzes, labs and homework

 projects. Pay special attention to arrays.

**Exam week December 12 – December 17** Final exam: check University schedule for day/time.

**Tests and quizzes**: There will be two tests and five quizzes during the semester designed as evaluation devices intended to prompt the student to stay abreast of assigned topics. Test dates will be announced in advance, while quizzes may be given un-announced at any time. No make-ups for missed quizzes will be granted. Make-ups for missed tests will only be granted in exceptional cases, following a timely arrangement BEFORE the test via e-mail explaining the reason for missing the test and after submitting supporting documentation. NO EXTRA WORK TO COMPENSATE FOR POOR PERFORMANCE ON TESTS OR MISSED QUIZZES WILL BE GIVEN, except for EXTRA 5 points which will be available to everyone for **assigned extra work during the semester which will be announced in class**.

**Final exam**: This will be a cumulative objective test on the entire semester's offerings.

**Class discussion**: Since the style of the class sessions is interactive, students are expected to come to class with prepared questions, comments and answers to the assigned exercises and projects.

**Homeworks**: Six official homeworks will be given ("unofficial" ones need not be submitted -- but they are not less important -- do not ignore them). The student is responsible for constructing a set of test cases which cover all of the possibilities inherent in that program assignment. Homeworks will be submitted via Blackboard Learn. They must include the following: (1) a pseudo code OR UML chart OR flow chart of program design (whichever is preferred or appropriate), except for homework 1; (2) java code; (3) example runs (outputs) of the programs needed to demonstrate their correctness; and (4) all relevant files needed to run them. **Homeworks will be graded upon degree of success, precise implementation of the theoretical concepts** and use of an appropriate program structure as discussed in class. **No “**free **style” unrelated to the concepts discussed in class programs will be accepted – they will bring 0 points even if they produce the expected result.** All homework assignments must be submitted by the due date. There will be a penalty for late submissions. Homeworks must be INDEPENDENT student work. “Share the work, share the grade” policy will apply for shared work. Homeworks that are clearly NOT done by the student will be given 0 points.

**Academic honesty**: All homeworks, tests and quizzes must be an individual effort of the student submitting the work for grading. See the section "Policy on Academic Honesty" in the CCSU Student Handbook.

**Attendance**: It is expected that the student will attend class sessions regularly. Absences result in the student being totally responsible for the make-up process.

**Student conduct**: It is expected that all students will conduct themselves in a respectful manner and will assist in maintaining an atmosphere conductive to learning in the classroom.

**Grades and evaluation**: The student will be evaluated regularly during the semester as follows

 - Test 1: 15 points. It provides 15% of the final grade.

 - Test 2: 20 points. It provides 20% of the final grade.

 - Quizzes 1, 2, 3, 4, and 5: 2 points each. They provide 10% of the final grade.

 - Homeworks 1, 2, 3, 4, 5, and 6: 5 points each. Each provides 5% of the final grade.

 - Final exam: 25 points. It provides 25% of the final grade.

 The final grade for the course will be determined as follows:

 Total points Final grade

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 93 - 105 A (5 extra points will be given for specific assignments announced in class

 throughout the semester)

 90 - 92.99 A-

 87 - 89.99 B+

 83 - 86.99 B

 80 - 82.99 B-

 77 - 79.99 C+

 73 - 76.99 C

 70 - 72.99 C-

 67 - 69.99 D+

 63 - 66.99 D

 60 - 62.99 D-

 below 60 F