

Summer II 2019, 3 cr.

Instructor: Mahadev N

Phone: xxx-xxx-xxxx **E-mail:** nmahadev@fitchburgstate.edu

Web: blackboard.fitchburgstate.edu

Suggested Text: Java Programming, From Problem Analysis to Program Design, Fifth Edition, by D.S. Malik, Course Technology 2012, and ISBN 9781111530532.

About the Text: I follow topics largely from the suggested text and provide notes. You may get the text to read more details on topics covered. Some topics covered may not be in the text in which case you rely on the notes and online materials.

Laptop and Software: Students will be running code in the class. They should carry a laptop to the class. We make an attempt to connect to the University servers in order to utilize the software that is already installed on them. But you must also install the software on your laptop just in case the connection could not be established. Following is the list of software that you will need. Download and install them in the order they are listed here. The links worked when I created this syllabus. If they do not work, google the text for the link.

[VMWare horizon client](#): Needed to connect to the server: desktop.fitchburgstate.edu

[Java SE Development Kit 8](#): We use jdk version 8, not jre. If you have a previous version of java, it is best to uninstall it first, then reboot and install this version.

[NetBeans 8](#): The simplest version 8 download option is enough. We use NetBeans as the platform for writing, running and testing the code.

Class hours: We meet two hours each day, Monday – Thursday for lectures and Fridays are used for reviews, tests, labs etc., typically conducted by TA.

Course Help: Sometimes one on one help is needed which cannot be provided during lectures. Contact me via email or at the end of a class for such help.

Fridays are times when a TA or I will most likely be available for help, but you can also make appointment to meet at other times.

Grading Policy: A combination of assignments (40%), tests (40%) and labs (20%). There is no final exam. No grade for attendance.

Course Description: This course introduces Computer Science by using a high-level programming language. Students will be taught to design programs and implement those using object-oriented programming techniques. This course provides a solid background for further studies in Computer Science by preparing students to enroll in the more specialized high-level software courses.

Prerequisite: Basic Math 2 (high school algebra) or equivalent knowledge.

Goals: By the end of the course, students must have a basic understanding of the role of algorithms and programming in computer science. Students will have understood the basic structure of programming and written and debugged several programs.

Topics Covered (Tentative): We try to cover the first 7 chapters of the text. See below the tentative coverage of topics each week.

Week 1: Computer and Programming Basics

Day 1: Basic introduction to how computers work (the fetch cycle), CPU, RAM, instruction sets, role of operating system, peripherals and software components. The role of computer programs and evolution of programming languages from machine language to assembly language to higher level languages such as Fortran, Pascal, C, C++ and Java.

Day 2: Problem analysis and algorithm design with examples. Design of pseudocode using algorithm primitives. A simple Java code example and dissecting it.

Day 3: Coding, compiling and running Java programs using NetBeans. Bits, bytes and ASCII characters. A brief introduction to the concepts of object oriented programming: java classes and objects, abstraction, encapsulation, inheritance, polymorphism, dot notation, code reuse, packages, etc.

Day 4: More examples of problem analysis, algorithm design, pseudocode as well as coding, compiling and running as NetBeans projects. Dissect each example identifying syntax rules, semantics, program styles, commenting, using built-in classes and methods for outputs, arithmetic expressions, etc. The 3 types of errors (syntax, run-time and logic).

Day 5: Review. Students will attempt to code solutions to a set of problems with TA's help. (This is your only lab.) A test during the last half hour about the concepts of this week.

Week 2: Java Programming Basics

Day 1: Review Java code structure. Java tokens: keywords, special symbols and identifiers. Syntax rules and programming style rules. Basic arithmetic operations and arithmetic expressions. Data types and variable declarations. Another code example starting with the problem statement.

Day 2: Number systems – binary, octal, decimal, and hexagonal. Converting between binary and decimal number systems. How integers and decimal numbers are represented. Assigning values to various data types. Default data types. Type conversion and casting with examples.

Day 3: Reading input with Scanner class and writing output using print() and println () methods. Escape sequences used in print methods. Code examples.

Day 4: Using various built-in methods of String, Math and JOptionPane classes with code examples. Java documentation on built-in classes.

Day 5: Review concepts of this week with code examples and a test during the second hour about the concepts of this week.

Week 3: File I/O, Selections and Loops in Java

Day 1: Reading input from a file and writing output to a file. String format and printf methods. Problem: read student scores from a file, compute averages and write them to output files. Constructor and the keyword 'new'. Exception handling with try/catch blocks.

Day 2: The if, else structures, the comparison and logical operators. Code examples. Modify previous code to include final letter grade after average score in the output file.

Day 3: String comparisons. Difference between == and equalsTo method. Operation precedencies, short circuit evaluations and conditional expression. Switch statement and code examples.

Day 4: Comparing while and for loops with examples. Use of continue and break with keywords. Code examples and designing tables to understand the loop behaviors. Homework assignment.

Day 5: Review and hints for the assignment. Work on the homework rest of the class time. TA is around to help with questions and hints.

Week 4: Graphical User Interface Applications Development

Day 1: GUI components, containers and layouts, using NetBeans design feature for a quick prototyping of user interface.

Day 2: Event handling and full implementation of a GUI app designed using NetBeans design feature. Important properties of JFrame, JTextField, JButton etc.

Day 3: Design and implementation of GUI app without using NetBeans design feature. A code example.

Day 4: Advanced GUI components such as JComboBox, JTable etc. Code example and homework problem.

Day 5: Review and hints for the assignment. Work on the homework rest of the class time. TA is around to help with questions and hints.

Week 5: Java Methods

Day 1: Review of concepts from the last two weeks. A test on those concepts during the second half.

Day 2: Anatomy of a Java method. Access modifiers, storage modifiers, return types, arguments. Defining set and get methods.

Day 3: Scope of variables, pass by value vs pass by reference. Method overloading.

Day 4: Review and code examples of class with defined methods and another test class that calls them.

Day 5: Review and a test of concepts from this week.

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Please Note:

- There are no make-ups for labs, tests or assignments unless you are hospitalized during that time. You get a zero on any missed lab, test, or assignment.
- Labs take place in the class without prior announcement. To get full credit, lab must be completed during the time assigned for them in the class.
- Tests can only be taken in the classroom at the announced time, even if they are administered on Blackboard.
- All tests are open book and open notes, but you cannot share books and notes with others.
- Incomplete grade is not given unless you have completed at least 80% of the work.
- You are responsible for all the material covered and all the announcements made in the class, on the Blackboard and via email.
- Plagiarism and misconduct are not tolerated in the college. Please refer to the student handbook or college catalog for college's policy on academic dishonesty.
- Claiming credit for work that is not yours or claiming credit in two different courses for the same work is academic dishonesty.
- Taking a look at each other's source code for assignments is plagiarism.

FITCHBURG STATE UNIVERSITY UNDERGRADUATE GRADING POLICY

<u>4.0</u>	<u>A</u>	<u>95 – 100</u>
<u>3.7</u>	<u>A-</u>	<u>92 – 94</u>
<u>3.5</u>	<u>A-/B+</u>	<u>89 - 91</u>
<u>3.3</u>	<u>B+</u>	<u>86 – 88</u>
<u>3.0</u>	<u>B</u>	<u>83 – 85</u>
<u>2.7</u>	<u>B-</u>	<u>80 – 82</u>
<u>2.5</u>	<u>B-/C+</u>	<u>77 – 79</u>
<u>2.3</u>	<u>C+</u>	<u>74 – 76</u>
<u>2.0</u>	<u>C</u>	<u>71 – 73</u>
<u>1.7</u>	<u>C-</u>	<u>69 – 70</u>
<u>1.5</u>	<u>C-/D+</u>	<u>67 – 68</u>
<u>1.3</u>	<u>D+</u>	<u>64 – 66</u>
<u>1.0</u>	<u>D</u>	<u>60 – 63</u>
<u>0.0</u>	<u>F</u>	<u>0 – 59</u>
-	<u>IN</u>	<u>Incomplete</u>
-	<u>IP</u>	<u>In Progress</u>
-	<u>W</u>	<u>Withdrawn</u>

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POLICY ON DISABILITY

If you need course adaptations or accommodations because of a disability, if you have emergency medication information, or if you need special arrangements in case the building must be evacuated, please make an appointment at the beginning of the course to talk with me. It is important that the issues relating to disabilities be discussed with me as soon as possible.

GRADE APPEAL

If you disagree with the evaluation of your work or believe an improper grade has been assigned, an appeal may be followed. Please discuss the matter with the instructor and refer to the Fitchburg State University Grade Appeal Policy in the university catalog.

ACADEMIC INTEGRITY POLICY

The faculty at Fitchburg State University require that work submitted in fulfillment of course requirements will be solely that of the individual candidate and all other sources will be cited appropriately. University Academic Integrity Policy, as outlined in the University Catalogue, will be strictly adhered to.

DISTANCE LEARNING & EXTENDED CAMPUS LIBRARY SERVICES

The Gallucci-Cirio Library at Fitchburg State University provides a full range of library services including borrowing privileges; document delivery (books and articles mailed to your home); Interlibrary Loan; reference assistance via: phone, email, IM, Blackboard's Collaboration and Elluminate tools, Skype and in-person; library instruction; research help and more. Any questions relating to library services should be directed to the Linda LeBlanc, Access Services Librarian, at 978-665-3062 or dllibrary@fitchburgstate.edu. There is also a special section for Distance Learning and Extended Campus Services at <http://fitchburgstate.libguides.com/dlservices> outlining the wide range of services available to you and how to access them.