

# COMP 2243-71 Programming and Problem Solving

Fall 2022

4 Credit Hours

Delivery Method: Mostly Online

This is a synchronous online class. It requires computer, Internet, video, and microphone capabilities. Classes will be held via Zoom meetings at the times listed on the schedule, the ability to meet at the scheduled times online is a requirement.

Exams are In-Person exams.

<b>Monday and Wednesday: 9:00 – 10:50 AM</b>	<b>Office Hours via Zoom</b>
<b>Classroom Location:</b> Zoom	Monday 11:00 AM – 12:00 PM and 3:00 – 4:00 PM
<b>Instructor:</b> Jim Ma	Tuesday 9:00 – 10:00 AM
<b>Office:</b> M2401T	Wednesday 11:00 AM – 12:00 PM and 3:00 – 4:00 PM
<b>Phone:</b> 529-2799	Thursday 9:00 – 10:00 AM
<b>Email:</b> <a href="mailto:jim.ma@rctc.edu">jim.ma@rctc.edu</a>	For other times, please make an appointment with me via email: <a href="mailto:jim.ma@rctc.edu">jim.ma@rctc.edu</a>

## Textbook

[Starting Out with Java – From Control Structures through Data Structures](#) 4<sup>th</sup> Edition

Author: Tony Gaddis and Godfrey Muganda

## Other Materials

Other materials may include notes and program examples.

Java Development Kit (JDK) and Integrated Development Environment (IDE) are required for home use, which can be free downloaded from Internet.

## Catalog Description

This course introduces the major concepts of problem solving, algorithm design, and programming. Emphasis is on algorithm development, analysis, refinement, top-down and object-oriented program development concepts. Simple and composite data types, classes, and control structures are covered. Java programming language will be used. Students may take COMP 1150 and COMP 2243 concurrently. College level reading is required.

## Course Prerequisites

COMP1150, MATH1115

## Recommended Entry Skills/Knowledge

Basic computer literacy; college algebra; exposure to concepts of data representation, logic, and algorithms (as in COMP1150).

## Learning Outcomes/Competencies

After completing this course, students will be able to:

- Design algorithms using stepwise refinement.
- Document algorithms using flowcharts of pseudo code.
- Write and document programs using simple data types and arrays.
- Use standard input and output devices, and file input and output in programs.
- Use selection and repetition control structures, and user-defined methods in programs.
- Implement algorithms utilizing recursive structures.
- Design, write, and document programs using object-oriented programming concepts including class, - encapsulation, and information hiding.
- Compile, link and run programs.
- Test and debug programs

## Assessment/Evaluation and Grading

The grading scale used to assign the course grade will depend on a number of factors including, but not limited to, difficulty and length of exams and assignments, and the overall ability of the students in the class as a whole to demonstrate a good understanding of the course material.

The students must receive a passing score ( $\geq 60$ ) on the average of three tests to get a passing grade. Once the student received the passing score ( $\geq 60$ ) on the average of three tests, the actual grade is calculated based on following scale:

Test 1 (Up to while loop) Test 2 (Up to OOP) Final Test (Comprehensive Test)	50%
Homework Assignments	40%
Lab Exercises / Class Activities	10%

The letter grade will be determined based on the following table:

$\geq 90\%$	A
$\geq 80\%$ and $< 90\%$	B
$\geq 70\%$ and $< 80\%$	C
$\geq 60\%$ and $< 70\%$	D
$< 60\%$	F

## Attendance Policy

Attendance is required for successful completion of this course. Other materials include handouts, class notes and program examples will be used, therefore, students will benefit greatly by attending class. If a student misses a class, it is the student's responsibility to get those materials. To receive full credit, each assignment must be submitted by the due date. Late submissions will be penalized. See the individual assignment sheet for details. Unexcused absences from exams will result in a score of 0 for that exam. No make-up exams will be given without prior arrangement (unless due to documented illness or emergency).

- If a student has 3 unexcused absences, up to 5% of total points may be deducted.
- If a student has 5 unexcused absences, up to 10% of total points may be deducted.
- If a student is absent for 25% or more of the course, the instructor reserves the right to assign an F, regardless of work completed.

## **Academic Integrity Statement**

The primary academic mission of Rochester Community and Technical College (RCTC) is the exploration and dissemination of knowledge, and academic honesty and integrity are integral to the academic process. Academic dishonesty - cheating, plagiarism, and collusion - is a serious offense which undermines the educational process and the learning experience for the entire college community. RCTC students are expected to understand and adhere to the concept of academic integrity and to the standards of conduct prescribed by the College's [Academic Integrity Policy](#). Any act of academic dishonesty attempted by a student at Rochester Community and Technical College is unacceptable and will not be tolerated.

## **Americans with Disability Act**

Rochester Community and Technical College is committed to ensuring its programs, services and activities are accessible to individuals with disabilities, through its compliance with state and federal laws, and [System Policy](#). Appropriate accommodations are provided to those qualified students with disabilities. If you believe you qualify for an academic accommodation, please contact the Director of Disability Support Services, Travis Kromminga at 507-280-2968 or through the Minnesota relay TTY 1-800-627-3529. The office can also be reached via e-mail at [DisabilityServices@rctc.edu](mailto:DisabilityServices@rctc.edu)

## **Military Friendly Statement**

Rochester Community and Technical College (RCTC) is a military friendly campus, pledging to do all we can to help military veterans transition into college to complete their educational goals. RCTC is proud to be a Beyond the Yellow Ribbon campus, serving and honoring our veterans, military service members and their families. Through the Veterans Resource Center, RCTC offers student veterans an on-campus point of contact with other veterans, and program information to assist them in making a successful transition into college. For assistance, students are encouraged to contact the Veterans Assistant Coordinator, Mark Larsen, at 507-779-9375 or e-mail at [mark.larsen@state.mn.us](mailto:mark.larsen@state.mn.us), or Othelmo da Silva, RCTC's VA certifying official at 507-285-7566 or email at [VeteranServices@rctc.edu](mailto:VeteranServices@rctc.edu).

## **Title IX Statement**

Sexual violence and other forms of sexual misconduct is prohibited at Minnesota State colleges and universities (Minnesota State). Any individual who has been, or is being, subjected to conduct prohibited by the Sexual Violence Policy is encouraged to report the incident. Individuals may choose to file a complaint anonymously using the online reporting tool (<https://www.rctc.edu/services/student-affairs/title-ix/>). Individuals who choose to file anonymous reports are advised that it may be difficult for the college to follow up or take specific action, where information is limited. For additional information please see the RCTC Sexual Violence Policy, <http://www.rctc.edu/policies/system/sexual-violence> or contact Teresa Brown, Title IX Coordinator, at 507-285-7108 or email at [TitleIX@rctc.edu](mailto:TitleIX@rctc.edu).

### Calendar of Assignments, Exams, and Due Dates (Tentative)

Assignment 1 – Java Fundamentals I	Due	Wednesday, 8/31
Assignment 2 – Java Fundamentals II	Due	Wednesday, 9/7
Assignment 3 – Decision Structures I	Due	Wednesday, 9/14
Assignment 4 – Decision Structures II	Due	Wednesday, 9/21
Assignment 5 – While Loop I	Due	Wednesday, 9/28
Test 1		Monday, 10/3
Assignment 6 – While Loop II	Due	Wednesday, 10/12
Assignment 7 – Other Loops and File I/O	Due	Wednesday, 10/19
Assignment 8 – Methods	Due	Wednesday, 10/26
Assignment 9 – Object Oriented Programming I	Due	Wednesday, 11/9
Test 2		Monday, 11/14
Assignment 10 – Object Oriented Programming II	Due	Wednesday, 11/23
Assignment 11 – Arrays	Due	Wednesday, 11/30
Assignment 12 – OOP with Array and Graphic User Interface	Due	Wednesday, 12/7
Final Exam		Monday, 12/12

### Important Dates

Monday, September 5: Labor Day (No Class)  
 Wednesday, September 14: Student Success Day (No Class)  
 Wednesday, November 23: Full-Term Course Withdraw Deadline

### Course Topics and Tentative Schedule

	Monday	Wednesday
Week 1	8/22  Chapter 1 – Introduction Java, JDK and IDE  Chapter 2 – Java Fundamentals Section 2.1 and 2.2: Java Basics Section 2.3: Variables Section 2.4: Primitives Section 2.5: Operators Section 2.11 and 2.12: Comments & Style	8/24  Chapter 2 – Java Fundamentals Section 2.13: Reading Keyboard Input Section 2.8: Constants Section 2.7: Data Conversion
Week 2	8/29  Chapter 2 Section 2.6: More Operators Section 2.9: String Class Section 2.14: Dialog Boxes Additional Topic: Garbage Collection Section 2.10: Scope	8/31  Chapter 3 – Decision Structures Section 3.1: The <code>if</code> Statement (One-Way Selection) Section 3.2 The <code>if-else</code> Statement (Two-Way Selection) Section 3.3: Nested <code>if</code> Statement  Assignment 1 (Fundamentals I) Due

Week 3	9/5 <b>Labor Day (No Class)</b>	9/7 Chapter 3 – Decision Structures Section 3.5: Logical (Boolean) Operators Section 3.10: Displaying Formatted Output Section 3.6: Comparing String Objects  <b>Assignment 2 (Fundamentals II) Due</b>
Week 4	9/12 Chapter 3 Section 3.4: The <code>if-else-if</code> Statement (Multiple Selection) Section 3.9: The <code>switch</code> Statement Section 3.8: Conditional Operator ( <code>? :</code> ) More on Decision/Selection Structures	9/14 <b>Student Success Day (No Class)</b>  <b>Assignment 3 (Decision Structures I) Due</b>
Week 5	9/19 Chapter 4 – Loops and Files Section 4.1: Increment / Decrement Operators Section 4.2: The <code>while</code> Loop Loop Basics Counter Controlled Loop	9/21 Chapter 4 Section 4.6: Sentinel Controlled Loop Flag Controlled Loop Section 4.3: Input Validation  <b>Assignment 4 (Decision Structures II) Due</b>
Week 6	9/26 Chapter 4 More on <code>while</code> Loop	9/28 Review for Test 1  <b>Assignment 5 (While Loop I) Due</b>
Week 7	10/3 <b><u>Test 1</u></b>	10/5 More on Loops
Week 8	10/10 Chapter 4 Section 4.4: The <code>do-while</code> Loop Section 4.5: The <code>for</code> Loop Section 4.7: Nested Loops Section 4.8: The <code>break</code> and <code>continue</code> Section 4.9: Which Loop to Use Section 4.10: File I/O (Input / Output)	10/12 Chapter 4 – Loops and Files Section 4.10: File I/O (Input / Output) More File I/O Section 4.11: Random Number  <b>Assignment 6 (While Loop II) Due</b>
Week 9	10/17 Chapter 4 – Loops and Files	10/19 Chapter 5 - Methods All Sections Additional Topic: Method Overloading  <b>Assignment 7 (Other Loops and File IO) Due</b>

Week 10	10/24 Chapter 5 - Methods All Sections Additional Topic: Method Overloading	10/26 Chapter 6 and Chapter 8 – OOP <b>Assignment 8 (Methods) Due</b>
Week 11	10/31 Chapter 6 and Chapter 8 – OOP	11/2 Chapter 6 and Chapter 8 – OOP
Week 12	11/7 Chapter 6 and Chapter 8 – OOP	11/9 Review for Test 2 Chapter 6 and Chapter 8 – OOP <b>Assignment 9 (OOP I) Due</b>
Week 13	11/14 <b><u>Test 2</u></b>	11/16 Chapter 7 – Arrays
Week 14	11/21 Chapter 7 - Arrays	11/23 Chapter 7 – Arrays GUI (Graphical User Interface) Programming <b>Assignment 10 (OOP II) Due</b>
Week 15	11/28 GUI (Graphical User Interface) Programming	11/30 GUI (Graphical User Interface) Programming <b>Assignment 11 (Array) Due</b>
Week 16	12/5 Chapter 9 – Strings Additional Topics	12/7 Additional Topics <b>Assignment 12 Due</b>
Week 17	12/12 <b><u>Final Test</u></b>	12/14 Grade Day

# ROCHESTER COMMON COURSE OUTLINE COMMUNITY AND TECHNICAL COLLEGE

Course discipline/number/title: COMP 2243: Programming and Problem Solving

A. CATALOG DESCRIPTION

1. Credits: 4
2. Hours/Week: 4
3. Prerequisites (Course discipline/number): COMP 1150, MATH 1115
4. MnTC Goals (if any): NA

This course introduces the major concepts of problem solving, algorithm design, and programming. Emphasis is on algorithm development, analysis, refinement, top-down and object-oriented program development concepts. Simple and composite data types, classes, and control structures are covered. Java programming language will be used. Students may take COMP 1150 and COMP 2243 concurrently. College level reading is required.

B. DATE LAST REVISED (Month, year): December, 2017

C. OUTLINE OF MAJOR CONTENT AREAS:

1. Problem solving approaches
2. Program development process
3. Input and output
4. Arithmetic expressions
5. Logical and relational expressions
6. Selection control structures
7. Repetition control structures
8. Methods
9. Simple data types
10. Object-oriented programming concepts including class, encapsulation, and information hiding

D. LEARNING OUTCOMES (GENERAL): The student will be able to:

1. Design algorithms using stepwise refinement.
2. Document algorithms using flowcharts of pseudo code.
3. Write and document programs using simple data types and arrays.
4. Use standard input and output devices, and file input and output in programs.
5. Use selection and repetition control structures, and user-defined methods in programs.
6. Implement algorithms utilizing recursive structures.
7. Design, write, and document programs using object-oriented programming concepts including class, encapsulation, and information hiding.
8. Compile, link and run programs.
9. Test and debug programs

E. LEARNING OUTCOMES (MNTC): NA

F. METHODS FOR EVALUATION OF STUDENT LEARNING:

Methods may include but are not limited to:

1. Tests
2. Lab exercises
3. Programming assignments
4. Comprehensive final exam

G. RCTC CORE OUTCOME(S) ADDRESSED:

- |   |   |
|---|---|
| <input type="checkbox"/> Communication                | <input type="checkbox"/> Civic Responsibility                 |
| <input checked="" type="checkbox"/> Critical Thinking | <input type="checkbox"/> Personal/Professional Accountability |
| <input type="checkbox"/> Global Awareness/Diversity   | <input type="checkbox"/> Aesthetic Response                   |

H. SPECIAL INFORMATION (if any): None