



Fall 2020

CSCI-40

## Programming Concepts and Methodology I Syllabus

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**Phone:** (559) 638-0300 x3497

**Response time:** < 24 hours

**Office Hours:** Fri 11am-12pm, Fri 3-5pm, by appt

**Section Number:** 53087

**Dates:** 8/10/2020 – 12/8/2020

**Class Meeting:** Tues & Thurs 2-5pm

**Location:** Online

**Classroom:** Zoom at

[https://cccconfer.zoom.us/j/99389287910?pwd=aIVs](https://cccconfer.zoom.us/j/99389287910?pwd=aIVsTmM2UUdpOS9FdFpUUkhqQ0NIUT09)

[TmM2UUdpOS9FdFpUUkhqQ0NIUT09](https://cccconfer.zoom.us/j/99389287910?pwd=aIVsTmM2UUdpOS9FdFpUUkhqQ0NIUT09)

**Unit(s):** 4

**Prerequisites:** MATH 4A - Trigonometry or MATH 4C - Trigonometry/Pre-calculus

**Advisory:** ENGL-125 – Writing Skills for College and ENGL-126 Reading Skills for College

**Course Description:** This course introduces problem solving, algorithm development, procedural and data abstraction using C++ language, program design, coding, debugging, testing, and documentation.

### Course Goals and Student Learning Outcomes:

*Upon completion of this course, students will be able to:*

- 🔥 Design, implement, test, and debug a program that uses each of the following fundamental programming constructs: basic computation, simple I/O, standard conditional and iterative structures, and the definition of functions.
- 🔥 Demonstrate different forms of binding, visibility, scoping, and lifetime management.
- 🔥 Write computer programs using an object-oriented programming language C++.
- 🔥 Summarize the evolution of programming languages illustrating how this history has led to the paradigms available today.
- 🔥 Use pseudocode or a programming language to implement, test, and debug algorithms for solving simple problems.

### Objectives:

*In the process of completing this course, students will:*

- 🔥 Demonstrate knowledge of high-level language syntax, control structures, looping, arrays, files, and records.
- 🔥 Demonstrate proper programming style, debugging and testing techniques.
- 🔥 Describe the software development life-cycle.
- 🔥 Explain what an algorithm is and its importance in computer programming.
- 🔥 Formulate, represent, and solve problems using a high level programming language.
- 🔥 Solve application problems in science and engineering.

### Required or Recommended Textbooks and Materials:

Textbooks:

1. **Required:** zyBooks, register and connect via Canvas before first meeting (cost: \$58).
2. **Optional:** *Starting out with C++ From Control Structures through Objects*, 9th Ed, By Tony Gaddis, Pearson

### Additional Resources:

Towson University Cybersecurity Modules: <https://cis1.towson.edu/~cssecinj/>

### Learning Management System: CANVAS:

Canvas (<https://sccd.instructure.com/>) is used to post announcements, course information, programming assignments, and grade. You will submit your programming assignments on Canvas.

To log-in Reedley College CANVAS:

Username: Your 7-digit student ID number.

Password: If you have not previously changed your password, it is:

*First name initial* (upper case) + *last name initial* (lowercase) + *date of birth* (mmddyy)

Example: John Smith born on July 9th of 1988      Password=Js070988

### Computer Lab:

Microsoft Visual Studio C++ compiler is used for this class.

### **Topics:**

- A. Programming Fundamentals (PF)
  - a. Fundamental programming constructs (PF1) (7 hours)
    - i. Basic syntax and semantics of a higher-level language
    - ii. Variables, types, expressions, and assignment
    - iii. Simple I/O and File I/O
    - iv. Conditional and iterative control structures
    - v. Functions and parameter passing
    - vi. Structured decomposition
  - b. Algorithms and problem-solving (PF2) (6 hours)
    - i. Problem-solving strategies
    - ii. The role of algorithms in the problem-solving process
    - iii. Implementation strategies for algorithms
    - iv. Debugging strategies
    - v. The concept and properties of algorithms
  - c. Fundamental data structures (PF3) (3 hours)
    - i. Primitive types
    - ii. Arrays
    - iii. Records
    - iv. Strings and string processing
    - v. Pointers and references
  - d. Recursion (PF4) (1 hour)
    - i. The concept of recursion
    - ii. Simple recursive procedures
  - e. Event-driven programming (PF5) (0.5 hour)
    - i. Exception handling
- B. Programming Language (PL)
  - a. Overview of programming languages (PL1) (1 hour)
    - i. History of programming languages
    - ii. Brief survey of programming paradigms
      - 1. Procedural languages
      - 2. Object-oriented languages
  - b. Declarations and types (PL4) (2 hours)
    - i. The conception of types and a set of values with together with a set of operations.
    - ii. Declaration models (scope and lifetime)
    - iii. Overview of type-checking
  - c. Abstraction mechanisms (PL5) (4 hours)
    - i. Procedures, functions, and iterators as abstraction mechanisms
    - ii. Parameterization mechanisms (reference vs. value)
    - iii. Modules in programming languages
  - d. Object-oriented programming (PL6) (10 hours)
    - i. Object-oriented design

- ii. Classes and Information-hiding
  - iii. Separation of concerns and implementation
- C. Discrete Structures (DS)
- a. Basic Logic (DS2) (1 hour)
    - i. Logical connectives (and, or, not)
    - ii. Truth tables (and, or, not)
- D. Algorithms and Complexity (AL)
- a. Algorithmic strategies (AL2) (2 hours)
    - i. Brute-force algorithms
    - ii. Divide-and-conquer
  - b. Fundamental computing algorithms (AL3) (2 hours)
    - i. Sorting algorithms
    - ii. Sequential and binary search algorithms
- E. Social and Professional Issues (SP)
- a. History of computing (SP1) (1 hour)
    - i. History of computer hardware, software, networking
    - ii. Software life cycle

### Tentative Schedule:

	Assignment Points	Date
<b>Week 1: Intro to Computers &amp; Programming</b>	<b>50</b>	<b>8/10/2020</b>
Class 2pm online		8/11/2020
Reading: Starting Out with C++ (SOWC++) Ch. 1		8/13/2020
<b>Class 2pm online</b>		<b>8/13/2020</b>
zyBooks Participation Activities	10	8/15/2020
Lab Set 1	20	8/15/2020
Schedule One-on-One	20	8/16/2020
<b>Week 2: Basic Data Types &amp; Operators</b>	<b>65</b>	<b>8/17/2020</b>
Reading: SOWC++ Ch. 2		8/19/2020
<b>Class 2pm online</b>		<b>8/18/2020</b>
<b>Class 2pm online</b>		<b>8/20/2020</b>
zyBooks Participation Activities	15	8/22/2020
Lab Set 2	20	8/22/2020
Homework Exercise	30	8/23/2020
<b>Week 3: Expressions &amp; Interactivity</b>	<b>28</b>	<b>8/24/2020</b>
<b>Class 2pm online</b>		<b>8/25/2020</b>
Reading: SOWC++ Ch. 3		8/27/2020
zyBooks Participation Activities	8	8/27/2020
<b>Class 2pm online</b>		<b>8/27/2020</b>
Lab Set 3	20	8/28/2020
<b>Week 4 : Conditional Branches</b>	<b>71</b>	<b>8/31/2020</b>
<b>Class 2pm online</b>		<b>9/1/2020</b>
Reading: SOWC++ Ch. 4		9/3/2020
zyBooks Participation Activities	21	9/3/2020
<b>Class 2pm online</b>		<b>9/3/2020</b>
Lab Set 4	20	9/4/2020
Homework Exercise	30	9/6/2020

<b>Week 5: Exam #1</b>	<b>50</b>	<b>9/7/2020</b>
<b>Exam #1 2pm online Exam review</b>	50	9/8/2020
<b>Exam #1 2pm online</b>		9/11/2020
<b>Week 6: Loops</b>	<b>34</b>	<b>9/14/2020</b>
Class 2pm online		9/15/2020
Reading: SOWC++ Ch. 5		9/17/2020
zyBooks Participation Activities	14	9/17/2020
<b>Class 2pm online</b>		9/17/2020
Lab Set 5	20	9/18/2020
<b>Week 7: Functions</b>	<b>62</b>	<b>9/21/2020</b>
<b>Class 2pm online</b>		9/22/2020
Reading: SOWC++ Ch. 6		9/24/2020
zyBooks Participation Activities	12	9/24/2020
<b>Class 2pm online</b>		9/24/2020
Lab Set 6.1, Lab Set 6.2	20	9/25/2020
Homework Exercise	30	9/27/2020
<b>Week 8: Arrays &amp; Vectors</b>	<b>32</b>	<b>9/28/2020</b>
Class 2pm online		9/29/2020
Reading: SOWC++ Ch. 7		10/1/2020
zyBooks Participation Activities	12	10/1/2020
<b>Class 2pm online</b>		10/1/2020
Lab Set 7	20	10/2/2020
<b>Week 9: Search and Sort Algorithms</b>	<b>51</b>	<b>10/5/2020</b>
<b>Class 2pm online</b>		10/6/2020
Reading: SOWC++ Ch. 8		10/8/2020
zyBooks Participation Activities	1	10/8/2020
<b>Class 2pm online</b>		10/8/2020
Lab Set 8	20	10/9/2020
Homework Exercise	30	10/11/2020
<b>Week 10: Exam #2</b>	<b>50</b>	<b>10/12/2020</b>
<b>Class 2pm online Exam Review</b>		10/14/2020
<b>Exam #2 2pm online</b>	50	10/16/2020
<b>Week 11: Pointers</b>	<b>26</b>	<b>10/19/2020</b>
Class 2pm online		10/20/2020
Reading: SOWC++ Ch. 9 Sections 1-9		10/22/2020
zyBooks Participation Activities	6	10/22/2020
Class 2pm online		10/22/2020
Lab Set 9	20	10/23/2020
<b>Week 12: Working with Characters &amp; Strings; Exceptions</b>	<b>54</b>	<b>10/19/2020</b>
Class 2pm online		10/20/2020
Reading: SOWC++ Ch. 10		10/22/2020
zyBooks Participation Activities	4	10/22/2020
<b>Class 2pm online</b>		10/22/2020
Lab Set 10	20	10/23/2020
Homework Exercise	30	10/25/2020

<b>Week 13: File Input &amp; Output; Streams</b>	<b>25</b>	<b>10/26/2020</b>
<b>Class 2pm online</b>		10/27/2020
Reading: SOWC++ Ch. 12		10/29/2020
zyBooks Participation Activities	5	10/29/2020
<b>Class 2pm online</b>		10/29/2020
Lab Set 12	20	10/30/2020
<b>Week 14: Intro to Classes; OOP</b>	<b>62</b>	<b>11/2/2020</b>
<b>Class 2pm online</b>		11/3/2020
Reading: SOWC++ Ch. 13 Sections 1-8, 10		11/5/2020
zyBooks Participation Activities	12	11/5/2020
<b>Class 2pm online Exam Review</b>		11/5/2020
Lab Set 13	20	11/6/2020
Homework Exercise	30	11/8/2020
<b>Week 15 Code Reviews</b>	<b>40</b>	<b>11/9/2020</b>
<b>Class 2pm online Code Review</b>		11/10/2020
<b>Class 2pm online Code Review</b>	40	11/13/2020
<b>Week 16: Recursion</b>	<b>3</b>	<b>11/12/2020</b>
<b>Class 2pm online</b>		11/15/2020
Reading: SOWC++ Ch. 20 (skim)		11/20/2020
zyBooks Participation Activities	3	11/20/2020
<b>Class 2pm online</b>		11/20/2020
<b>Week 17: Intro to Java, Review</b>	<b>30</b>	<b>11/23/2020</b>
<b>Class 2pm online</b>		11/24/2020
Reading: TBA		11/28/2020
<b>Class 2pm online</b>		11/26/2020
Homework Exercise	30	11/29/2020
<b>Week 18: Finals Week</b>	<b>267</b>	<b>11/30/2020</b>
Project	110	12/1/2020
Final Exam 2pm online	125	12/1/2020
Professionalism	32	
<b>TOTAL</b>	<b>1000</b>	

### Subject to Change:

This syllabus and schedule are subject to change. If you are absent from class meeting, it is your responsibility to check on any changes made while you were absent.

### Evaluation:

Students will be evaluated on the basis of their performance on various assignments according to the following scale. The instructor reserves the right to adjust scores as it may be required throughout the semester.

Points in the course total 1000 and are distributed as follows:

zyBooks Participation Activities	123
Lab Sets	240
Homework Exercises	210
Exams	225
Project	150

Final grade is assigned using following scale:

900-1000 points	A
800- 899 points	B
700- 799 points	C
600- 699 points	D
< 600 points	F

### Attendance

Attendance for onsite and synchronous online meetings will be taken at beginning of each class. Students who leave before the end of class will be marked tardy. For synchronous online meetings you are expected to have your camera turned on and will have the best experience if you use earbuds/headphones. Please make sure to stay muted until you have a question or something to add so as to cut down on background noise.

Students will be dropped from the class if they fail to attend the first class session of the semester. During the semester up to final drop date, any student who missed two weeks of class meetings (cumulative) will be dropped from this class (i.e. 4 classes).

Make-up tests are limited to students who have made arrangements with the instructor **prior** to the announced testing date or those students who have been excused by High School Attendance Office. Exam material is constructed from class discussions, assigned readings, guest lectures, video presentations, and special assignments.

**Unless the student receives prior approval from the instructor, no make-up tests will be allowed.**

### Grading Policy

zyBooks Participation Activities:

ZyBooks participation activities must be completed before announced due date (typically at start of class on Thursday for full credit, exception in the first two weeks). These activities allow you to actively engage each week's content. Points will be attributed according to the number of responses required and the percentage of the activities a student completes before class. Reference the following rubric:

Percentage Completed	Before Thursday Class Points Awarded	After Thursday Class by End of Week Points Awarded
90%+	100% of points	90% of points
80%+	90% of points	80% of points
70%+	80% of points	70% of points
60%+	70% of points	60% of points
50%+	60% of points	50% of points
25%+	40% of points	30% of points
13%+	20% of points	10% of points

### Homework Assignments:

Homework exercises are generally assigned every two weeks for each week of instruction and consist of zyBooks challenge activities and other programming problems. For example, a homework assignment is due at the end of week two covering content from weeks 1 and 2. Each assignment is worth 30 points and will be graded based on correctness and functionality. Any program that does not compile will not receive a passing grade. Points will be deducted for late homework. Homework is to be submitted electronically in Canvas.

### Lab Assignments:

Lab assignments are assigned before each lab session. A pre-lab is to be completed individually before the Thursday meeting. You will work in pairs or small groups and should usually be able to complete the lab assignment at end of the two-hour lab period. If groups need more time, the lab can be completed outside of the meeting time and are due on Fridays. Turn in the lab assignment on LMS-Canvas.

Submit your program (source code only, no executable file) and program input/output on LMS- Canvas.

### Programming Project:

There will be additional programming project that will be completed outside the class sessions. The project will be announced after Exam #2 in week 11.

**Exams:**

Exams will be administered during class time in weeks 5 (covers weeks 1-4), 11 (covers weeks 6-10), and 18 (cumulative, with some emphasis on weeks 11-18). Exams 1 and 2 are worth 50 points each and the final exam is worth 125 points. Exams will cover material as indicated:

A more difficult late test can only be arranged if you have an excuse verified and request before the exam is administered.

**College Policies:**

**Cheating & Plagiarism**, see Cheating and Plagiarism under Campus Policies:

Cheating and plagiarism is prohibited in the class. Incidents of cheating and plagiarism will result a failing grade on the particular assignment in question. Please see Student Conduct Standards at <https://www.reedleycollege.edu/about/about-us/policies-and-procedures/student%20conduct%20standards.html> for more information about academic integrity.

Each student is expected to assist in the overall environment of the classroom making it conducive to learning.

**Accommodations for Students with Disabilities**

If you have a verified need for an academic accommodation or materials in alternate media (i.e., Braille, large print, electronic text, etc.) per the Americans with Disabilities Act (ADA) or Section 504 of the Rehabilitation Act, please contact the Reedley College Disabled Students Programs & Services (DSP&S) Department at (559) 638-0332. You can find more information at <https://www.reedleycollege.edu/student-services/disabled-student-programs-and-services/index.html>.

**Reedley College is committed to creating accessible learning environments consistent with federal and state law. To obtain academic adjustments or auxiliary aids, students must be registered with the DSP&S office on campus. DSP&S can be reached at (559) 638-3332. If you are already registered with the DSP&S office, please provide your Notice of Accommodation form as soon as possible.**

**Important College Dates Fall 2020**

Class begin	Monday	08/10/2020
Last day to drop a full-term class for a full refund	Friday	08/21/2020
Last day to register	Friday	08/28/2020
Last day to drop this class to avoid a “W” in person	Friday	08/28/2020
Last day to drop this class to avoid a “W” on Web	Sunday	08/30/2020
Last date to drop this class	Friday	10/09/2020
No classes, campus is closed		
Labor Day	Monday	09/07/2020
Veterans Day	Wednesday	11/11/2020
Thanksgiving	Thurs-Fri	11/26/2020 – 11/27/2020
<b>Final Exam</b>	<b>Tuesday</b>	<b>12/08/2020 2:00 – 3:50 pm</b>