Fall 2021
CSCI-40
Programming Concepts and Methodology I
Syllabus

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Office Hours: Mon 11am-12pm, Thurs 9-10am
FEM-4A

Section Number: 55333
Unit(s): 4
Dates: 8/9/2021 – 12/13/2021
Class Meeting: Mon & Wed 9-10:50am
Location: FEM 3

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.

Student Learning Outcomes are statements about what the discipline faculty hope you will be able to do at the end of the course. This is NOT a guarantee: the ultimate responsibility for whether you will be able to do these things lies with you, the student. In addition, the assessment of Student Learning Outcomes is done by the department in order to evaluate the program as a whole, and not to evaluate individual faculty performance.

Required or Recommended Textbooks and Materials:

Textbooks:

1. **Required**: zyBooks, register and connect via Canvas before first meeting (cost: $58).
   A. Click on your zyBooks link in your learning management system
      (Do not go to the zyBooks website and create a new account)
   B. Subscribe
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://scccd.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
Day 0		**8/9/2021**
Class 9am - Syllabus & Course Procedures		8/9/2021
Week 1: Intro to Computers & Programming	**50**	**8/11/2021**
Class 9am		8/11/2021
zyBooks Participation Activities	10	8/16/2021
Class 9am - Lab		8/16/2021
Lab Set 1	20	8/18/2021
Schedule One-on-One	20	8/15/2021
Week 2: Basic Data Types & Operators	**65**	**8/18/2021**
Class 9am		8/18/2021

zyBooks Participation Activities	15	8/23/2021
Class 9am - lab		8/23/2021
Lab Set 2	20	8/25/2021
Homework Exercise	30	8/27/2021
Week 3: Expressions & Interactivity	**28**	**8/25/2021**
Class 9am		8/25/2021
zyBooks Participation Activities	8	8/30/2021
Class 9am - lab		8/30/2021
Lab Set 3	20	9/1/2021
Week 4: Conditional Branches	**70**	**9/1/2021**
Class 9am		9/1/2021
No Class Monday 9/6 - Labor Day		
zyBooks Participation Activities	20	9/8/2021
Class 9am - lab		9/8/2021
Lab Set 4	20	9/10/2021
Homework Exercise	30	9/12/2021
Week 5: Exam #1	**50**	
Exam #1 9am Exam Q&A online	0	9/10/2021
Exam #1 9am	50	9/13/2021
Week 6: Loops	**34**	**9/15/2021**
Class 9am		9/15/2021
zyBooks Participation Activities	14	9/20/2021
Class 9am		9/20/2021
Lab Set 5	20	9/22/2021
Week 7: Functions	**82**	**9/22/2021**
Class 9am		9/22/2021
zyBooks Participation Activities	12	9/27/2021
Class 9am - lab		9/27/2021
Lab Set 6.1, Lab Set 6.2	40	9/29/2021
Homework Exercise	30	10/1/2021
Week 8: Arrays & Vectors	**32**	**9/29/2021**
Class 9am		9/29/2021
zyBooks Participation Activities	12	10/4/2021
Class 9am - lab		10/4/2021
Lab Set 7	20	10/6/2021
Week 9: Search and Sort Algorithms	**53**	**10/6/2021**
Class 9am		10/6/2021
zyBooks Participation Activities	3	10/11/2021
Class 9am - lab		10/11/2021
Lab Set 8	20	10/13/2021
Homework Exercise	30	10/15/2021
Week 10: Exam #2	**50**	**10/13/2021**
Class 9am Exam Q&A		10/13/2021
Exam #2 9am	50	10/18/2021
Week 11: Pointers	**26**	**10/20/2021**
Class 9am		10/20/2021

zyBooks Participation Activities	6	10/25/2021
Class 9am - lab		10/25/2021
Lab Set 9	20	10/27/2021
Week 12: Working with Characters & Strings; Exceptions	**54**	**10/27/2021**
Class 9am		10/27/2021
zyBooks Participation Activities	4	11/1/2021
Class 9am - lab		11/1/2021
Lab Set 10	20	11/3/2021
Homework Exercise	30	11/5/2021
Week 13: File Input & Output; Streams	**25**	**11/3/2021**
Class 9am		11/3/2021
zyBooks Participation Activities	5	11/8/2021
Class 9am - lab		11/8/2021
Week 13 Lab	20	11/10/2021
Week 14: Intro to Classes; OOP	**62**	**11/10/2021**
Class 9am		11/10/2021
zyBooks Participation Activities	12	11/15/2021
Class 9am - lab		11/15/2021
Lab Set 13	20	11/17/2021
Homework Exercise	30	11/19/2021
Week 15: Recursion	**23**	**11/17/2021**
Class 9am		11/17/2021
zyBooks Participation Activities	3	11/22/2021
Class 9am - lab		11/22/2021
Week 15 Lab	20	11/24/2021
Week 16 Code Reviews	**40**	**11/24/2021**
Class 9am		11/24/2021
Code Review - Online Video + Discussion Forum	30	12/1/2021
Code Review - Online Video + Discussion Forum	10	12/4/2021
Week 17: Intro to Python, Review	**0**	**11/29/2021**
Class 9am		11/29/2021
Class 9am - lab		12/1/2021
Lab Activity (lowest dropped)	-	12/3/2021
Week 18: Finals Week	**256**	**12/6/2021**
Project	110	12/6/2021
Final Exam 9am	125	12/6/2021
Professionalism	21	
TOTAL	1000	

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	125
Lab Sets	280
Homework assignments	180
Exams	225
Project	150
Professionalism/1:1	40

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 Following Monday Class Points Awarded	Before Following Wednesday Class 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. Homework is to be submitted electronically in Canvas.

Lab Assignments/Class Activities:
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. Lowest class activity/lab will be dropped.

Programming Project:
There will be additional programming project that will be completed outside the class sessions. The project will be announced after Exam #2.

Exams:
Exams will be administered during class time in weeks 5 (covers weeks 1-4), 10 (covers weeks 6-9), 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.

Late Policy
Points will be deducted for late homework problem sets at 5% per day late, up to one week late (not excepted more than one week late). Homework is to be submitted electronically in Canvas and all work must be shown for partial credit. **Labs/class activities and projects will not be accepted late.**

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.
Code created by external sources can be utilized with permission from the instructor and 1) must be properly documented so as not to plagiarize the work of others and 2) must not make up more than 10% of the actual code (exclusive of documentation) of the project.

It is expected each student will do his/her own work unless otherwise instructed. This course involves both individual work and collaborative work. It is your responsibility to understand the guidelines that apply to each kind of work, and to be clear about which assignments are individual assignments and which are collaborative.

Activities not designated as cooperative assignments in this course are to be done individually. Individual work is to be carried out entirely and solely by an individual. Programs will be checked for plagiarism using both computer and human similarity checkers. Take extreme precautions that your individual work is not viewed by other students. This includes deleting all your computer files from public workstations when you are finished, retaining private permissions on your files, destroying printouts of source code, and not letting other students use your personal computer where you store your coursework.

In addition, the work you submit must be entirely your original creation. Using solutions from any other source is forbidden; in particular, using solutions (either instructors' or other students') from previous offerings of this or other courses is not allowed. Using solutions found on the Internet or getting help from online forums is not allowed.

Assignments which appear to be the result of a "group effort", or appear to have been copied from another student, will be considered plagiarized. Violations of this policy will be reported as violation of academic integrity per college policy.

In-class activities are designated as pair or team activities. Students will be assigned a partner or will self-assign to complete these activities. Be sure to use these collaborative activities as a chance to master the skills, as there will be quizzes in which each person must perform the skills individually.

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 2021

Class begin	Monday	08/09/2021
Last day to drop a full-term class for a full refund	Friday	08/20/2021
Last day to register	Friday	08/27/2021
Last day to drop this class to avoid a “W” in person	Friday	08/27/2021
Last day to drop this class to avoid a “W” on Web	Sunday	08/29/2021
Last date to drop this class	Friday	10/08/2021
No classes, campus is closed		
Labor Day	Monday	09/06/2021
Veterans Day	Friday	11/11/2021
Thanksgiving Day	Thurs-Fri	11/25-26/2021
Final Exam	**Monday**	**12/06/2021**