Reedley College

Spring 2024
CSCI-40
Programming Concepts and Methodology I
Syllabus

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(PHY-81), or by appt

Section Number: 52004
Unit(s): 4
Dates: 1/8/2024 – 5/14/2024
Class Meeting: Tues & Thurs 9-10:50am
Location: PHY-82

Prerequisites: MATH 3A – College Algebra for STEM
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.

This class is offered in a two-way interactive format, meaning that students have the choice of joining the meetings on campus or via Zoom. Please note that live attendance is required each week (in person or online). It is up to each student how they would like to attend each week. Note we will be working on labs in small groups and we will combine students who are in person and online. Students are required to attend the exams (Tuesday, February 13; Tuesday, April 2; and Tuesday, May 14) on campus. Please let me know if you have any questions.

Course Goals and Student Learning Outcomes:
Upon completion of this course, students will be able to:
- Design, implement, and test an algorithm, then a program to solve a problem.
- Demonstrate ability to properly use data types, including primitives and arrays.
- Utilize each of the following fundamental programming constructs: basic computation, simple I/O, standard conditional and iterative structures, functions, and classes.
- Demonstrate ability to work in a team by communicating clearly with stakeholders.
- Explain code functionality and design to others and provide feedback to and utilize feedback from others.

Objectives:
In the process of completing this course, students will:
- Understand fundamental programming constructs, including basic computation, simple I/O, standard conditional and iterative structures, functions, and classes.
- Summarize the evolution of programming languages and explain similarities and differences of at least two popular languages.
- Understand different forms of binding, visibility, scoping, lifetime management, and abstraction.
- Understand the techniques of structured (functional) decomposition to break a program into smaller pieces.
- Identify activities involved in different approaches to software development lifecycle.

- Demonstrate understanding of syntax and readability practices of an in-demand language.
- Explore different approaches to software development lifecycle process.

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.

<u>Required or Recommended Textbooks and Materials:</u>
   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 <u>not</u> 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

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

<u>Learning Management System: CANVAS:</u>

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

<u>Computer Lab:</u>
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		**1/9/2024**
Class 9am - Syllabus & Course Procedures		1/9/2024
Week 1: Intro to Computers & Programming	**45**	**1/11/2024**
Class 9am		1/11/2024
zyBooks Participation Activities	10	1/16/2024
Class 9am - lab		1/16/2024
Lab Set 1	20	1/18/2024
Schedule One-on-One	15	1/14/2024
Week 2: Basic Data Types & Operators	**70**	**1/18/2024**
Class 9am		1/18/2024
zyBooks Participation Activities	15	1/23/2024
Class 9am - lab		1/23/2024
Lab Set 2	20	1/25/2024
Homework Exercise	35	1/25/2024
Week 3: Expressions & Interactivity	**28**	**1/25/2024**
Class 9am		1/25/2024
zyBooks Participation Activities	8	1/30/2024
Class 9am - lab		1/30/2024
Lab Set 3	20	2/1/2024
Week 4: Conditional Branches	**75**	**2/1/2024**
Class 9am		2/1/2024
zyBooks Participation Activities	20	2/6/2024
Class 9am - lab		2/6/2024
Lab Set 4	20	2/8/2024
Homework Exercise	35	2/8/2024
Week 5: Exam #1	**50**	
Exam Q&A 9am ONLINE	0	2/8/2024
Exam #1 9am ON CAMPUS ONLY - PHY 82	50	2/13/2024
Week 6: Loops	**34**	**2/15/2024**
Class 9am		2/15/2024
zyBooks Participation Activities	14	2/20/2024
Class 9am		2/20/2024
Lab Set 5	20	2/22/2024
Week 7-8: Functions	**88**	**2/22/2024**
Class 9am		2/22/2024
zyBooks Participation Activities	13	2/27/2024
Class 9am - lab		2/27/2024
Class 9am - lab		2/29/2024
Lab Set 6.1, Lab Set 6.2	40	3/1/2024
Homework Exercise	35	3/1/2024
Week 8-9: Arrays & Vectors	**32**	**3/5/2024**
Class 9am		3/5/2024
zyBooks Participation Activities	12	3/12/2024

Class 9am - lab		3/7/2024
Class 9am - lab		3/12/2024
Lab Set 7	20	3/14/2024
Week 10: Search and Sort Algorithms	**58**	**3/14/2024**
Class 9am		3/14/2024
zyBooks Participation Activities	3	3/19/2024
Class 9am - lab		3/19/2024
Lab Set 8	20	3/22/2024
Homework Exercise	35	3/22/2024
Week 11: Exam #2	**70**	**3/21/2024**
Exam Q&A 9am		3/21/2024
Project Proposal	20	4/4/2024
Exam #2 9am ON CAMPUS ONLY - PHY 82	**50**	**4/2/2024**
Week 12: Pointers	**25**	**4/4/2024**
Class 9am		4/4/2024
zyBooks Participation Activities	5	4/9/2024
Class 9am - lab		4/9/2024
Lab Set 9	20	4/11/2024
Week 13: Intro to Classes; OOP	**67**	**4/11/2024**
Class 9am		4/11/2024
zyBooks Participation Activities	12	4/16/2024
Class 9am - lab		4/16/2024
Lab Set 13	20	4/18/2024
Homework Exercise	35	4/18/2024
Week 14: OOP Part 2; Exceptions	**26**	**4/18/2024**
Class 9am		4/18/2024
zyBooks Participation Activities	6	4/23/2024
Class 9am - lab		4/23/2024
Week 14 Lab	20	4/25/2024
Week 15 Code Reviews	**40**	**4/25/2024**
Class 9am Presentation/Feedback Day #1		4/25/2024
Class 9am Presentation/Feedback Day #2		4/30/2024
Code Review - Presentation	30	4/30/2024
Code Review - Peer Feedback	10	4/30/2024
Week 16: Recursion	**58**	**5/2/2024**
Class 9am		5/2/2024
zyBooks Participation Activities	3	5/7/2024
Class 9am - lab		5/7/2024
Week 16 Lab	20	5/10/2024
Homework Exercise	35	5/10/2024
Week 17: Intro to Python, Review	**90**	**5/9/2024**
Class 9am		5/9/2024
Project	90	5/10/2024
Lab Activity (lowest dropped)	-	5/11/2024
Week 18: Finals Week	**144**	**5/14/2024**
Final Exam 9am ON CAMPUS ONLY - PHY 82	**125**	**5/14/2024**

Professionalism	19	
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	121
Lab Sets	260
Homework assignments	210
Exams	225
Project	150
Professionalism/1:1	34

Final grade is assigned using following scale:

895-1000	points	A
795- 894	points	B
695- 794	points	C
595- 694	points	D
< 595 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 Tuesday Class Points Awarded	Before Following Thursday 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 second weekly 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.

Code Review:
Students are to present a piece of code they have written and discuss their design and coding choices. These must be done in person or online with a camera on. Students should share their code as they discuss it. Students are also responsible for entertaining questions at the end of their presentation and are responsible for asking questions or making meaningful suggestions to at least two other students. See Canvas for details.

Exams:
Exams will be administered during class time in weeks 5 (covers weeks 1-4), 10 (covers weeks 6-9), and 18 (cumulative, with emphasis on weeks 11-18). Exams will cover material as indicated. A 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.

A note on the use of AI
It is crucial to address the potential perils associated with the misuse of Artificial Intelligence (AI) in academic settings. Using AI to cheat not only undermines the learning experience but also violates the principles of academic integrity.

Perils of AI Cheating:
- Ethical Breach: Utilizing AI to cheat goes against the core values of honesty, integrity, and personal responsibility in academic pursuits.
- Short-Term Gains, Long-Term Consequences: While AI might provide a temporary advantage, the long-term consequences include a lack of genuine understanding, hindering your overall academic and professional development.

- Violation of Academic Policies: Most educational institutions have strict policies against cheating. Using AI to gain an unfair advantage can lead to severe academic penalties and damage your academic record.
- Missed Learning Opportunities: The primary purpose of education is to foster genuine understanding and skill development. Cheating with AI denies you the opportunity to acquire essential knowledge and skills.

My Expectations:

I, as your instructor, emphasize the importance of upholding academic integrity. I trust you will approach your studies with honesty, diligence, and a commitment to genuine learning.

Remember the true value of your education lies not just in grades but in the skills, knowledge, and ethical foundation you acquire. Resist the temptation to misuse AI for academic dishonesty, and instead, channel your efforts towards becoming proficient, ethical computer scientists.

Let's create an environment where academic excellence is synonymous with integrity.

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 Spring 2024

Class begins	Monday	01/08/2024
Last day to drop a full-term class for a full refund	Friday	01/19/2024
Last day to register	Friday	01/26/2024
Last day to drop this class to avoid a "W" in person	Friday	01/26/2024
Last day to drop this class to avoid a "W" online	Sunday	01/28/2024
Last date to drop this class	Friday	03/08/2024
Spring recess (no classes held)	Mon-Fri	03/25-29/2024
No classes, campus is closed		
Martin Luther King, Jr. Day observed	Monday	01/15/2024
Lincoln Day observance	Friday	02/16/2024
Washington Day observance	Monday	02/19/2024
Good Friday	Friday	03/29/2024
Final Exam	Thursday	05/14/2024