CSC205: LOGIC AND DESIGN

Credit Hours: 3

Contact Hours: This is a 3-credit course, offered in accelerated format. This means that 16 weeks of material is covered in 8 weeks. The exact number of hours per week that you can expect to spend on each course will vary based upon the weekly coursework, as well as your study style and preferences. You should plan to spend 14-20 hours per week in each course reading material, interacting on the discussion boards, writing papers, completing projects, and doing research.

Faculty Information: Faculty contact information and office hours can be found on the faculty profile page.

COURSE DESCRIPTION AND OUTCOMES

Course Description:

This course provides students with a broad view of principles and theories of computer programming. This course also provides students an introduction to information management methods and techniques used to solve fundamental computer programming problems. In addition, students learn the relationship between operating system drivers and programming concepts. Students develop an understanding of software engineering methods, processes and techniques used to build software systems using fundamental software development methods and tools.

Course Overview:

This course will teach the fundamentals of logic and design. Students will learn to think logically and design programs. Examples will be implemented to give students an understanding of how languages work to implement the programmer's logic and design. Students will also get a foundation in understanding how software engineers use methods, processes, techniques and measurements to effectively build software systems that satisfy the requirements of stakeholders and analyze fundamental software development concepts that affect software development methods and tools. Critical thinking will be embedded in the course, giving students real world practice scenarios to work through.

Course Learning Outcomes:

1. Identify information management methods and techniques that are appropriate to solve a given fundamental programming problem.
2. Explain the relationship between drivers in an operating system and basic programming.
3. Discuss the principles that influence programming language features.
4. Analyze fundamental software development concepts that affect software development methods and tools.
5. Explain how software engineers use methods, processes, techniques and measurements to effectively build software systems that satisfy the requirements of stakeholders.

PARTICIPATION & ATTENDANCE

Prompt and consistent attendance in your online courses is essential for your success at CSU-Global Campus. Failure to verify your attendance within the first 7 days of this course may result in your withdrawal. If for some reason you would like to drop a course, please contact your advisor.

Online classes have deadlines, assignments, and participation requirements just like on-campus classes. Budget your time carefully and keep an open line of communication with your instructor. If you are having technical problems, problems with your assignments, or other problems that are impeding your progress, let your instructor know as soon as possible.

COURSE MATERIALS

Required:

Farrell, J. (2018). *Programming logic and design, comprehensive* (9th ed.). Boston, MA: Cengage Learning. ISBN 978-1337102070

The Draw.io flowchart creation tool: https://www.draw.io/.

NOTE: All non-textbook required readings and materials necessary to complete assignments, discussions, and/or supplemental or required exercises are provided within the course itself. Please read through each course module carefully.

COURSE SCHEDULE

Due Dates

The Academic Week at CSU-Global begins on Monday and ends the following Sunday.

- **Discussion Boards:** The original post must be completed by Thursday at 11:59 p.m. MT and peer responses posted by Sunday at 11:59 p.m. MT. Late posts may not be awarded points.
- **Opening Exercises:** Take the Opening Exercise before reading each week's content to see which areas you will need to focus on. You may take these exercises as many times as you need. The Opening Exercises will not affect your final grade.
- **Mastery Exercises:** Students may access and retake Mastery Exercises through the last day of class until they achieve the scores they desire.
- **Critical Thinking:** Assignments are due Sunday at 11:59 p.m. MT.

WEEKLY READING AND ASSIGNMENT DETAILS

Module 1

Readings

· Chapter 1 in *Programming Logic and Design* (9th Ed.)

Opening Exercise (0 points)

Discussion (25 points)

Mastery Exercise (10 points)

Critical Thinking (55 points)

Choose one of the following two assignments to complete this week. Do not do both assignments. Identify your assignment choice in the title of your submission.

Option #1: Addition Pseudo-code and Flowchart

Create a pseudo-code document and flowchart with Draw.io based upon the following problem:

Add two numbers entered by a user

Upload both documents for evaluation by your instructor. Be sure that you discuss the pseudo-code in high level language. It should match up with the flowchart.

Option #2: User Question Pseudocode and Flowchart

Create a pseudo-code document and flowchart with Draw.io based upon the following problem:

Ask the User a question. Read in an answer. Insert the response into an answer.

Upload both documents for evaluation by your instructor. Be sure that you discuss the pseudo-code in high level language. It should match up with the flowchart.

Portfolio Project Reminder (0 points)

Be sure to review the Portfolio Project Description and Portfolio Project Rubric in the Module 8 folder for details.

Module 2

Readings

· Chapter 2 in *Programming Logic and Design* (9th ed.)

Opening Exercise (0 points)

Discussion (25 points)

Mastery Exercise (10 points)

Critical Thinking (55 points)

Choose one of the following two assignments to complete this week. Do not do both assignments. Identify your assignment choice in the title of your submission.

Option #1: Vehicle Tax

When purchasing a vehicle in Madison County, the cost per 100 dollars of the vehicle in tax is $0.85. As such, the assessor of the county would like a program that showcases the appropriate tax collection on a vehicle given the purchase price. Furthermore, the assessor would also like a selection for the total taxes collected given the number of cars input. So, you must be sure to include buttons for taxes on a single vehicle entered. There must be a second button to store the amount and add it to any previous amounts stored. There should be a third button to tabulate and display the total taxes gathered to the screen.

- Create a chart that lists the variables involved.
- Create a pseudo-code document that discusses how you might accomplish this program.
- Finally, create a diagram for the flowchart and the UI of the program.

Option #2: Power Company Pay Structure

The local power company has three different pay periods. Some workers are paid via the job, some are paid weekly, and others are paid only once a month. The accounts payable department has had a horrific time paying all of these by hand and trying to ensure that the appropriate pay goes to the appropriate employee. The accounts payable department has asked HR to have a program created that allows them to input the name of the employee and have the program showcase the employee's pay. In order to do this, your program will have to draw on an external database or stylesheet to populate the data. Assume this has already been done for you. You must have a button to import the data. You should then have a text box for input of the employee name. The third button should then populate the pay field based upon the name.

- Create a pseudo-code document that discusses how you might accomplish this program.
- Finally, create a diagram for the flowchart and the UI of the program.

Module 3

Readings

· Chapters 3 & 4 in *Programming Logic and Design* (9th ed.)

Opening Exercise (0 points)

Discussion (25 points)

Mastery Exercise (10 points)

Critical Thinking (60 points)

Choose one of the following two assignments to complete this week. Do not do both assignments. Identify your assignment choice in the title of your submission.

Option #1: Salesperson Sales

Cecilia's Boutique wants several lists of salesperson data. Design a flowchart or pseudo-code for the following:

A program that accepts one salesperson's ID number, number of items sold in the last month, and total value of the items, and displays data message only if the salesperson is a high performer—defined as a person who sells more than 200 items in the month. Ensure that the output showcases the appropriate flag so that Cecilia can provide an accolade to the salesperson.

Option #2: Salesperson Performance

Cecilia's Boutique wants several lists of salesperson data. Design a flowchart or pseudo-code for the following:

A program that accepts the salesperson's data and displays a message only if the salesperson is a high performer—defined as a person who sells more than 200 items worth at least $1,000 in the month. Ensure that the output showcases the appropriate flag so that Cecilia can provide an accolade to the salesperson.

Module 4

Readings

·   Chapter 5 in *Programming Logic and Design* (9th ed.)

Opening Exercise (0 points)

Discussion (25 points)

Mastery Exercise (10 points)

Critical Thinking (60 points)
Choose one of the following two assignments to complete this week. Do not do both assignments. Identify your assignment choice in the title of your submission.

Option #1: Bob's E-Z Loan Application
Design an application for Bob's E-Z Loans. The application accepts a client's loan amount and monthly payment amount. Output the customer's loan balance each month until the loan is paid off. Showcase your pseudo-code and flowchart to complete this program.

Option #2: Hunterville College Tuition
Design a program for Hunterville College. The current tuition is $20,000 per year, and tuition is expected to increase by 3 percent each year. Display the tuition each year for the next 10 years.

Module 5

Readings

·   Chapter 6 in *Programming Logic and Design* (9th ed.)

Opening Exercise (0 points)

Discussion (25 points)

Mastery Exercise (10 points)

Critical Thinking (70 points)
Choose one of the following two assignments to complete this week. Do not do both assignments. Identify your assignment choice in the title of your submission.

Option #1: Tom's Athletic Club
Trainers at Tom's Athletic Club are encouraged to enroll new members. Write an application that allows Tom to enter the names of each of his 25 trainers and the number of new members each trainer has enrolled this year. Output is the number of trainers who have enrolled 0 to 5 members, 6 to 12 members, 13 to 20 members, and more than 20 members.

Option #2: Most Commonly Used Passwords

Search the web to discover the 10 most common user-selected passwords, and store them in an array. Design a program that prompts a user for a password, and continues to prompt the user until the user has not chosen one of the common passwords. Ensure that you store their password and can add that to the list so they cannot choose that password when they must change their password in the future.

Module 6

Readings

· Chapters 7 & 8 in *Programming Logic and Design* (9th ed.)

Opening Exercise (0 points)

Discussion (25 points)

Mastery Exercise (10 points)

Critical Thinking (70 points)
Choose one of the following two assignments to complete this week. Do not do both assignments. Identify your assignment choice in the title of your submission.

Option #1: Classified Ad Selection
The Daily Trumpet newspaper accepts classified advertisements in 15 categories, such as Apartments for Rent and Pets for Sale. Develop the logic for a program that accepts classified advertising data, including a category code (an integer 1 through 15) and the number of words in the ad. Store these values in parallel arrays. Then sort the arrays so that records are sorted in ascending order by category. The output lists each category number, the number of ads in the category, and the total number of words in the ads in the category.

Option #2: Roofing Customer List
Gimme Shelter Roofers maintains a file of past customers, including a customer number, name, address, date of job, and price of job. It also maintains a file of estimates given for jobs not yet performed; this file contains a customer number, name, address, proposed date of job, and proposed price. Each file is in customer number order. Design the logic that merges the two files to produce one combined file of all customers, whether past or proposed, with no duplicates; when a customer who has been given an estimate is also a past customer, use the proposed data.

Module 7

Readings

· Chapter 9 in *Programming Logic and Design* (9th ed.)

Opening Exercise (0 points)

Discussion (25 points)

Mastery Exercise (10 points)

Module 8

Readings

· Chapter 10 in *Programming Logic and Design* (9th ed.)

Opening Exercise (0 points)

Discussion (25 points)

Mastery Exercise (10 points)

Portfolio Project (350 points)
Choose one of the following two assignments to complete this week. Do not do both assignments. Identify your assignment choice in the title of your submission.

Option #1: Work Reflection
Compile your work from past weeks to now. Make adjustments that your instructor has given you and make adjustments based upon the new learning you have done in the successive weeks. Do any of your flowcharts or pseudo-code have a place where a different method, modularization, or looping could be more effective? Ask these questions when reviewing your programs. Submit the completed works with a short discussion on why changes were made. If no changes were made, explain the reasons behind that.

Instructions:
- Your paper should be three to four pages long, or approximately 300 words (excluding cover page and references).
- Your responses should be well supported.
- Your paper must include a minimum of two credible, non-text references and be formatted according to *CSU Global Guide to Writing & APA*.
- Use the CSU-Global library to find references.
- Be sure to discuss and reference concepts taken from the assigned textbook reading and relevant research.

Option #2: Reflection and Redesign

Select two of your projects from the previous modules. Using the techniques you have learned up to now, redesign them and make them more complex. Be sure to create a new flowchart and table. Discuss the changes that you made to the projects and why you made these changes.

Instructions:
- Your paper should be three to four pages long, or approximately 300 words (excluding cover page and references).
- Your responses should be well supported.
- Your paper must include a minimum of two credible, non-text references and be formatted according to *CSU Global Guide to Writing & APA*.
- Use the CSU-Global library to find references.
  Be sure to discuss and reference concepts taken from the assigned textbook reading and relevant research.

Grading Scale	
A	95.0 – 100
A-	90.0 – 94.9
B+	86.7 – 89.9
B	83.3 – 86.6
B-	80.0 – 83.2
C+	75.0 – 79.9
C	70.0 – 74.9
D	60.0 – 69.9
F	59.9 or below

Course Grading

20% Discussion Participation
0%   Opening Exercises
8%   Mastery Exercises
37% Critical Thinking Assignments
35% Final Portfolio Project

For information on late work and incomplete grade policies, please refer to our **In-Classroom Student Policies and Guidelines** or the Academic Catalog for comprehensive documentation of CSU-Global institutional policies.

Academic Integrity
Students must assume responsibility for maintaining honesty in all work submitted for credit and in any other work designated by the instructor of the course. Academic dishonesty includes cheating, fabrication, facilitating academic dishonesty, plagiarism, reusing /repurposing your own work (see CSU-Global Guide to Writing & APA for percentage of repurposed work that can be used in an assignment), unauthorized possession of academic materials, and unauthorized collaboration. The CSU-Global Library provides information on how students can avoid plagiarism by understanding what it is and how to use the Library and internet resources.

Citing Sources with APA Style
All students are expected to follow the CSU-Global Guide to Writing & APA when citing in APA (based on the most recent APA style manual) for all assignments. A link to this guide should also be provided within most assignment descriptions in your course.

Disability Services Statement
CSU-Global is committed to providing reasonable accommodations for all persons with disabilities. Any student with a documented disability requesting academic accommodations should contact the Disability Resource Coordinator at 720-279-0650 and/or email ada@CSUGlobal.edu for additional information to coordinate reasonable accommodations for students with documented disabilities.

Netiquette
Respect the diversity of opinions among the instructor and classmates and engage with them in a courteous, respectful, and professional manner. All posts and classroom communication must be conducted in accordance with the student code of conduct. Think before you push the Send button. Did you say just what you meant? How will the person on the other end read the words?

Maintain an environment free of harassment, stalking, threats, abuse, insults, or humiliation toward the instructor and classmates. This includes, but is not limited to, demeaning written or oral comments of an ethnic, religious, age, disability, sexist (or sexual orientation), or racist nature; and the unwanted sexual advances or intimidations by email, or on discussion boards and other postings within or connected to the online classroom. If you have concerns about something that has been said, please let your instructor know.