

**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.

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## COURSE DESCRIPTION AND OUTCOMES

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### COURSE DESCRIPTION:

An introduction to computer science fundamentals, which includes: the ability to identify problem-solving methods; algorithm analysis and strategy; exploration of computer systems functional components; exploration of the interrelationships between varying computer science concepts; and an overview of information management and information assurance and security. Students get the foundational knowledge of computer science concepts that will be utilized throughout the course of study.

### COURSE OVERVIEW:

This course will introduce you to the field of computer science and the fundamentals of computer programming. Computer Science Fundamentals is specifically designed for students with no prior programming experience and taking this course does not require a background in computer science. This course will touch upon a variety of fundamental topics within the field of computer science including brief overviews of some computer programming languages. We will begin with an overview of the course topics as well as a brief history of software development. We will cover basic object-oriented programming terminology and concepts such as objects, classes, inheritance, and polymorphism, as well as the fundamentals of programming languages, relational operators, control statements, exception handling, and file input/output. By the end of the course, you should have a strong understanding of the fundamentals of computer science. This course will lay the groundwork for a strong education in computer science and a successful career devoted to implementing the principles you will learn as you progress through the computer science discipline.

### COURSE LEARNING OUTCOMES:

1. Explain algorithm strategies and analysis techniques.
2. Apply fundamental data structures, and computational theories and complexities.
3. Identify computer systems' functional components.
4. Discuss how to harness parallelism to sustain system performance.
5. Apply programming concepts related to algorithm construction and design.

6. Explain foundational concepts of information security as they relate to balancing key security properties: confidentiality, integrity and availability.
7. Describe how information is captured, stored, transformed, and represented so humans can gain access and make decisions with that data and information.

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## PARTICIPATION & ATTENDANCE

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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 seven 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.

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## COURSE MATERIALS

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### Required:

Vahid, F. & Lysecky, S. (2019). *CSC200: Computer science fundamentals*. Retrieved from <http://www.zybooks.com>. ISBN: 978-1-5418-4994-5

**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.

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## COURSE SCHEDULE

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### 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 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.

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## WEEKLY READING AND ASSIGNMENT DETAILS

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### MODULE 1

#### Readings

- Chapters 1 & 2 in *CSC200: Computer Science Fundamentals*

- Carlucci Aiello, L. (2016). The multifaceted impact of Ada Lovelace in the digital age. *Artificial Intelligence*, 23558-62. doi:10.1016/j.artint.2016.02.003

### **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* complete both assignments. Identify your assignment choice in the title of your submission. Note that while there are two options for the Critical Thinking Assignment, there is only one rubric. Review the rubric to confirm you are meeting the assignment requirements.

#### **Option #1: History of Ada Lovelace**

Ada Lovelace is considered the world's first programmer. In a 2-3 page paper, discuss why she is considered as such, what we learned from her, and what we have learned since her time.

Your submission should be 2-3 pages in length (excluding cover page and references) and formatted according to the CSU-Global Guide to Writing and APA. Be sure to discuss and reference concepts taken from the course reading material and relevant research. You must include a minimum of three credible, academic or professional references beyond the text or other course materials. Review the grading rubric to see how you will be graded for this assignment.

#### **Option #2: Comparison of Programming Languages**

FORTRAN and COBOL were two high-level languages defined during the second generation of computer software. Compare and contrast these languages in terms of their history, their purpose, and their importance in computer science.

Your submission should be 2-3 pages in length (excluding cover page and references) and formatted according to the CSU-Global Guide to Writing and APA. Be sure to discuss and reference concepts taken from the course reading material and relevant research. You must include a minimum of three credible, academic or professional references beyond the text or other course materials. Review the grading rubric to see how you will be graded for this assignment.

#### **Portfolio Project Reminder (0 points)**

A final Portfolio Project is due at the end of the course. You have *two options* from which to choose for this final project. This week, you should review the Portfolio Project options and the Portfolio Project Grading Rubric.

Keep in mind that you have two preliminary deliverables for your Portfolio Project (in Weeks 3 and 5).

## **MODULE 2**

### **Readings**

- Chapter 3 in *CSC200: Computer Science Fundamentals*

- Klein, B. (2017). *Data types and variables*. Retrieved from [https://www.python-course.eu/python3\\_variables.php](https://www.python-course.eu/python3_variables.php)
- Krill, P. (2017). Java, C, C++ face growing competition in popularity. *InfoWorld.com*.
- Yegulalp, S. (2018). Beyond Java: Programming languages on the JVM. *InfoWorld.com*.

### 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* complete both assignments. Identify your assignment choice in the title of your submission. Note that while there are two options for the Critical Thinking Assignment, there is only one rubric. Review the rubric to confirm you are meeting the assignment requirements.

#### Option #1: Creating Simple Java Code

Write a Java program to print the sum (addition), multiplication, subtraction, and division of two numbers.

Start your code by copying/pasting this information into an editor like notepad, notepad++, or IDLE:

```
public class Main {  
    public static void main(String[] args) {  
        // Write your code here  
    }  
}
```

#### Sample input:

Input first number: 125  
Input second number: 24

#### Sample Output:

125 + 24 = 149  
125 - 24 = 101  
125 x 24 = 3000  
125 / 24 = 5

Your submission should include the .txt file with the entire code, including the input and output.

Review the grading rubric to see how you will be graded for this assignment.

#### Option #2: Creating Simple Python Code

Read two integers and print three lines. Select three different operators to use in this activity. You do not need to perform any rounding or formatting operations.

**Input Format:** The first line contains the first integer. The second line contains the second integer.

**Output Format:** Print the three lines as described above.

#Store Input Numbers

#Add (subtract, multiply, divide, floor divide, remainder) two numbers

#Display the sum (difference, for example)

**Sample Input:**

4

3

**Sample Output:**

4 // 3 = 1

4 / 3 = 1.3333333333333333

4 & 3 = 1

Edit your Python program using your choice of editor such as Notepad, Notepad++, or Idle. Idle is a simple Python interactive development environment. Submit the document as a .txt file.

Your submission should include the .txt file with the entire code, including the input and output.

Review the grading rubric to see how you will be graded for this assignment.

## MODULE 3

### Readings

- Chapter 4 in *CSC200: Computer Science Fundamentals*
- AL-Azzam, S., & Qatawneh, M. (2018). Parallel processing of sorting and searching algorithms comparative study. *Modern Applied Science*, 12(4), 143-150.
- Liu, T., Liu, Y., Qian, C., & Qian, D. (2017). IOPA: I/O-aware parallelism adaption for parallel programs. *PLoS ONE*, 12(3).  
doi:<http://dx.doi.org.csuglobal.idm.oclc.org/10.1371/journal.pone.0173038>

### 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* complete both assignments. Identify your assignment choice in the title of your submission. Note that while there are two options for the Critical Thinking Assignment, there is only one rubric. Review the rubric to confirm you are meeting the assignment requirements.

### Option #1: Problem Solving Strategies in Practice

Describe the different problem-solving strategies. Apply those problem-solving strategies to the following situations:

- Buying a toy for your four-year-old niece or nephew
- Organizing an awards banquet for your child's soccer team
- Buying a dress or suit for an awards banquet at which you are being honored.

Examine the solutions above and determine three things they have in common.

Your submission should be 3-5 pages in length (excluding cover page and references) and formatted according to the CSU-Global Guide to Writing and APA. Be sure to discuss and reference concepts taken from the assigned textbook reading and relevant research. You must include a minimum of three credible, academic or professional references beyond the text or other course materials. Review the grading rubric to see how you will be graded for this assignment.

### **Option #2: Algorithms in Practice**

Discuss what an algorithm is and how you perceive it. Then, write an algorithm for the following tasks:

- a. Making a peanut butter and jelly sandwich
- b. Getting up in the morning
- c. Doing your homework
- d. Driving home in the afternoon.

Your submission should be 3-5 pages in length (excluding cover page and references) and formatted according to the CSU-Global Guide to Writing and APA. Be sure to discuss and reference concepts taken from the assigned textbook reading and relevant research. You must include a minimum of three credible, academic or professional references beyond the text or other course materials. Review the grading rubric to see how you will be graded for this assignment.

### **Portfolio Project Milestone (25 points)**

Given the below example, complete the following activities in a Word document. Include a brief discussion (2-4 sentences) on each activity.

Example: Write an algorithm that sets bottom equal to the last element in the stack, leaving the stack empty.

Answer: `WHILE (NOT IsEmpty(myStack))  
Pop(myStack, bottom)`

1. Write an algorithm that sets bottom equal to the last element in the stack, leaving the stack unchanged.
2. Write an algorithm to create a copy of myStack, leaving myStack unchanged.
3. Write an algorithm that sets last equal to the last element in a queue, leaving the queue empty.

Your submission should meet the following requirements:

- Be approximately 1-2 pages in length, not including the cover page and reference page.
- Follow the CSU-Global Guide to Writing and APA.
- Be clear and well-written, concise, and logical, using excellent grammar and style techniques. You are being graded in part on the quality of your writing. If you need assistance with your writing style, start with *Tools for Effective Writing* in the CSU-Global Library, accessible from the Library's homepage.

Review the grading rubric to see how you will be graded for this assignment.

## Readings

- Chapters 5 & 6 in *CSC200: Computer Science Fundamentals*

### 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* complete both assignments. Identify your assignment choice in the title of your submission. Note that while there are two options for the Critical Thinking Assignment, there is only one rubric. Review the rubric to confirm you are meeting the assignment requirements.

#### Option #1: Operating Systems and Multiprogramming

Discuss what an operating system is and provide some examples of newer operating systems available today. Distinguish between application software and system software. Give an example of each.

Explain the term **multiprogramming**. The following terms relate to how the operating system manages multiprogramming. Describe the part each plays in the process:

- Process
- Process management
- Memory management
- CPU scheduling.

Your paper should be 3-5 pages in length (excluding cover page and references) and formatted according to the CSU-Global Guide to Writing and APA. Be sure to discuss and reference concepts taken from the assigned reading and relevant research. You must include a minimum of three credible, academic or professional references beyond the text or other course materials. Review the grading rubric to see how you will be graded for this assignment.

#### Option #2: Multitasking and Multi-core Operating Systems

Address the following items in an APA-formatted essay submission:

- a. What is a multitasking operating system?
- b. Identify some situations in which you can take advantage of a PC's multitasking capabilities.
- c. What is a multi-core operating system?
- d. What is the difference between a firmware update and an operating system update?

Your paper should be 3-5 pages in length (excluding cover page and references) and formatted according to the CSU-Global Guide to Writing and APA. Be sure to discuss and reference concepts taken from the assigned reading and relevant research. You must include a minimum of three credible, academic or professional references beyond the text or other course materials. Review the grading rubric to see how you will be graded for this assignment.

## MODULE 5

### Readings

- Chapters 7 & 8 in *CSC200: Computer Science Fundamentals*
- Li, C. (2018). Consumer behavior in switching between membership cards and mobile applications: The case of Starbucks. *Computers in Human Behavior, 84*, 171-184.

### **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* complete both assignments. Identify your assignment choice in the title of your submission. Note that while there are two options for the Critical Thinking Assignment, there is only one rubric. Review the rubric to confirm you are meeting the assignment requirements.

#### **Option #1: Understanding Java in Computing**

In a 3-5 page paper, answer the following questions in a well-written and APA-formatted essay submission:

- What is a Java applet?
- How do you embed a Java applet in an HTML document?
- Where does a Java applet get executed?
- What kinds of restrictions are put on Java applets? Why?
- What is a Java Server Page?

Your paper should be 3-5 pages in length (excluding cover page and references) and formatted according to the CSU-Global Guide to Writing and APA. Be sure to discuss and reference concepts taken from the assigned textbook reading and relevant research. You must include a minimum of three credible, academic or professional references beyond the text or other course materials. Review the grading rubric to see how you will be graded for this assignment.

#### **Option #2: Creating a Basic HTML Document**

Distinguish between an HTML tag and an attribute. Then, create an HTML document for a webpage that has each of the following features:

- a. Centered title
- b. Unordered list
- c. Ordered list
- d. Link to another webpage
- e. A picture.

This submission includes two deliverables. First, a paper distinguishing between an HTML tag and an attribute, which should be 1-2 pages in length (excluding cover page and references) and formatted according to the CSU-Global Guide to Writing and APA. Be sure to discuss and reference concepts taken from the assigned textbook reading and relevant research. You must include a minimum of one credible, academic or professional reference beyond the text or other course materials. Second, an HTML document should be submitted as an .html file including features a-e above (you can use Notepad to create this webpage and rename it with the .html tag). Submit both activities as a .zip file so only one file needs to be uploaded. Review the grading rubric to see how you will be graded for this assignment.



### **Portfolio Project Milestone (25 points)**

This milestone builds upon the last by adding a few more activities. Like the previous milestone, complete the following activities in a Word document. Include a brief discussion (2-4 sentences) on each activity:

1. Write an algorithm that sets last equal to the last element in a queue, leaving the queue unchanged.
2. Write an algorithm to create a copy of myQueue, leaving myQueue unchanged.
3. Write an algorithm Replace that takes a stack and two items. If the first item is in the stack, replace it with the second item, leaving the rest of the stack unchanged.
4. Write an algorithm Replace that takes a queue and two items. If the first item is in the queue, replace it with the second item, leaving the rest of the queue unchanged.

Your submission should meet the following requirements:

- Be approximately 1-2 pages in length, not including the cover page and reference page.
- Follow the CSU-Global Guide to Writing and APA.
- Be clear and well-written, concise, and logical, using excellent grammar and style techniques. You are being graded in part on the quality of your writing. If you need assistance with your writing style, start with *Tools for Effective Writing* in the CSU-Global Library, accessible from the Library's homepage.

Review the grading rubric to see how you will be graded for this assignment.

## **MODULE 6**

### **Readings**

- Chapters 9 & 10 in *CSC200: Computer Science Fundamentals*

### **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* complete both assignments. Identify your assignment choice in the title of your submission. Note that while there are two options for the Critical Thinking Assignment, there is only one rubric. Review the rubric to confirm you are meeting the assignment requirements.

#### **Option #1: Security Policies Online**

Find an example of a security policy posted on a website and list three of the most important statements it makes regarding the management of information. Why do you think the statements you chose are important? Be sure to cite your website within your paper.

Your paper should be 3-5 pages in length (excluding cover page and references) and formatted according to the CSU-Global Guide to Writing and APA. Be sure to discuss and reference concepts taken from the assigned textbook reading and relevant research. You must include a minimum of three credible, academic or professional references beyond the text or other course materials. Review the grading rubric to see how you will be graded for this assignment.

## **Option #2: CIA Triad and Data Integrity Violations**

The goals of information security—confidentiality, integrity, and availability—are referred to as the CIA triad. In this week’s critical thinking activity, discuss the concept of the CIA triad, while providing relevant examples of each of the three goals. Additionally, give three examples of data integrity violations. Please provide detailed information on all three examples within your paper.

Your paper should be 3-5 pages in length (excluding cover page and references) and formatted according to the CSU-Global Guide to Writing and APA. Be sure to discuss and reference concepts taken from the assigned textbook reading and relevant research. You must include a minimum of three credible, academic or professional references beyond the text or other course materials. Review the grading rubric to see how you will be graded for this assignment.

## **MODULE 7**

### **Readings**

- Chapter 11 in *CSC200: Computer Science Fundamentals*
- Malik, S., & Al-Emran, M. (2018). Social factors influence on career choices for female computer science students. *International Journal of Emerging Technologies in Learning (IJET)*, 13(5), 56-70.
- Ruan, J., Chan, F., Zhu, F., Wang, X., & Yang, J. (2016). A visualization review of cloud computing algorithms in the last decade. *Sustainability*, 8(10), 1008.

### **Opening Exercise (0 points)**

### **Discussion (25 points)**

### **Mastery Exercise (10 points)**

## **MODULE 8**

### **Readings**

- Chapter 12 in *CSC200: Computer Science Fundamentals*
- Ortiz, J., Chih, W., & Tsai, F. (2018). Information privacy, consumer alienation, and lurking behavior in social networking sites. *Computers in Human Behavior*, 80, 143.
- Wu, Y., Venkatraman, S., & Chiu, M. (2016). Research collaboration and topic trends in Computer Science based on top active authors. *PeerJ Computer Science*, 2(1), 1-21.

### **Opening Exercise (0 points)**

### **Discussion (25 points)**

### **Mastery Exercise (10 points)**

### **Portfolio Project (300 points)**

Choose one of the following two Portfolio Projects to complete. Do not do both assignments. Identify your assignment choice in the title of your submission. Review the Portfolio Project Grading Rubric to understand how you will be graded on your project.

#### **Portfolio Project Option #1: Algorithm Design and Word Document**

The final project includes three deliverables:

1. Both of your Portfolio Milestones’ submissions combined into one document

2. Development of an algorithm
3. A Word document.

### **For your Algorithm Design**

Algorithms appear almost everywhere in life. For example, a store clerk uses an algorithm with tasks such as scanning items, bagging groceries, and accepting your payment. Other algorithms, such as those that make up computer operating systems, are much more complex. In general, the goal of algorithm design is to complete a job in fewer steps. From what you have learned in the course, use critical thinking to create your own algorithm to complete a computing task. You can use C++, Java, or Python3 to create your algorithm.

Tips:

- Remove unwanted comments.
- Use proper logic.
- Use fast calculating iterations.
- Have a clear plan before creating the algorithm.
- Make it small.
- Make it efficient.

### **For your Word Document**

There are four steps to algorithm methodology. In a 3-4 page paper, discuss your algorithm design in relation to these four steps. Describe how you went through each step of the methodology to create your algorithm.

Your paper should be 3-4 pages in length (excluding the cover page and references, which are required) and formatted according to the CSU-Global Guide to Writing and APA. Be sure to discuss and reference concepts taken from the textbook and relevant research. You must include a minimum of three credible, academic or professional references. Review the grading rubric to see how you will be graded for this assignment.

Create a zip file that includes all three requirements and upload that zip file for grading.

### **Portfolio Project Option #2: Algorithm Design and PowerPoint Presentation**

The final project includes three deliverables:

1. Both of your Portfolio Milestones' submissions combined into one document
2. Development of an algorithm
3. A PowerPoint presentation.

### **For your Algorithm Design**

Algorithms appear almost everywhere in life. For example, a store clerk uses an algorithm with tasks such as scanning items, bagging groceries, and accepting your payment. Other algorithms, such as those that make up computer operating systems, are much more complex. In general, the goal of algorithm design is to complete a job in fewer steps. From what you have learned in the course, use critical thinking to create your own algorithm to complete a computing task. You can use C++, Java, or Python3 to create your algorithm.

Tips:

- Remove unwanted comments.
- Use proper logic.
- Use fast calculating iterations.
- Have a clear plan before creating the algorithm.
- Make it small.
- Make it efficient.

**For your PowerPoint Presentation**

There are four steps to algorithm methodology. In an 8-10 slide PowerPoint presentation, discuss your algorithm design in relation to these four steps. Describe how you went through each step of the methodology to create your algorithm:

- Your presentation must be 8-10 slides in length, not including the title and reference slides, which are required.
- Include images and content *with detailed, thorough speaker notes* for each slide. Be sure to discuss and reference concepts taken from the textbook and relevant research.
- You must include a minimum of three credible, academic or professional references.
- Your presentation must follow the CSU-Global Guide to Writing and APA.
- Review the grading rubric to see how you will be graded for this assignment.

Create a zip file that includes all three requirements and upload that zip file for grading.

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## COURSE POLICIES

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### Course Grading

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

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

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## IN-CLASSROOM POLICIES

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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 and 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 and 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](mailto:ada@CSUGlobal.edu) for additional information to coordinate reasonable accommodations.

### **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.