COLORADO STATE UNIVERSITY GLOBAL

MIS540: INTRODUCTION TO BUSINESS INTELLIGENCE

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 an overview of Business Intelligence (BI) for an enterprise, establishing the foundation for using data in cross-functional key areas, such as accounting, sales, production, customer data, and other elements. This examination will assist with generating actionable intelligence data for decision making in order to achieve or maintain competitive advantage in the workplace and evaluate how well corporate key performance indicators are being met. The course, also, discusses the challenges of data privacy and ethics in business intelligence.

COURSE OVERVIEW:

In this course, you will explore business intelligence techniques applied in different industries. In this course, you will gain fundamental business intelligence knowledge, specifically to what business intelligence is, including learning basic activities involved in running a successful business intelligence system. You will also practice business analytics principles, concepts, and applications using SAS software.

COURSE LEARNING OUTCOMES:

1. Gain an overview of business intelligence and uses of BI in organizations to meet strategic objectives.
2. Analyze business data and recommend techniques to transform data into a form used by organizations to gain business advantage.
3. Demonstrate the ability to provide data analysis and find applicable business intelligence solutions.
4. Explore data privacy and ethics in business intelligence.

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:

- Sharda, R., Delen, D., & Turban, E. (2017). *Business intelligence, analytics, and data science: A managerial perspective* (4th ed.). Boston: Pearson. eISBN-13: 9780134633282
- Elliott, A. C., & Woodward, W. A. (2015). *SAS essentials: Mastering SAS for data analytics* (2nd ed.). John Wiley & Sons. eISBN-13: 9781119042167
- SAS University Edition Software: https://www.sas.com/en_us/software/university-edition/download-software.html (This comes free with the text.)

Required Technology:

Please note the section at the bottom of this syllabus on "SAS Resources and Information on Certification."

Suggested:

- Schniederjans, M. (2015). *Business analytics principles, concepts, and applications with SAS: What, why, and how* (1st ed.). New York: New York. Pearson FT Press PTG.

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 Resources

Course Resources section provides resources for you and should be referenced throughout the course to assist in your understanding and practice using the different programs. Review the videos to learn more about the different analytics software and programs. For this course specifically, you should focus on Statistics, Python, R, and Tableau.

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 11:59 p.m. MT. Late posts may not be awarded points.
- **Critical Thinking:** Assignments are due Sunday at 11:59 p.m. MT.
- **Portfolio Project and Milestones:** Look for the Portfolio Milestones in weeks 3 and 5 which prepare you for your final Portfolio Project due in Week 8.

WEEKLY READING AND ASSIGNMENT DETAILS

MODULE 1

Readings

- Overview & Chapter 1 in *Business Intelligence, Analytics, and Data Science: A Managerial Perspective*
- Chapters 1, 2, 3, 4, & Appendix E in *SAS Essentials*
- Mills, R. J., Chudoba, K. M., & Olsen, D. H. (2016). IS programs responding to industry demands for data scientists: A comparison between 2011-2016. *Journal of Information Systems Education*, 27(2), 131-140.
- Villamarín García, J. M., & Díaz Pinzón, B. H. (2017). Key success factors to business intelligence solution implementation. *Journal of Intelligence Studies in Business*, *7*(1), 48-69.

Discussion (25 points)

Critical Thinking (65 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: Manufacturing BI Use Case: Increase Operation Efficiency

This assignment has two parts, A and B.

IMPORTANT: To receive full credit, you must complete both Part A and Part B of this assignment.

Part A

A manufacturing factory operation needs to build an integrated portal system for factory floor employees and staff to use to increase operational efficiency.

The portal will need to connect 300 parts and equipment suppliers, control guided machines on a factory line, move raw materials and finished products from one workstation to another, trigger blockage on the factory line, predict parts replacement, and automate parts ordering. Additionally, the portal should streamline operations for better decision making, inventory management, transactional processing tasks, report generation, and data storage, and communicate reports with authorized users.

Instructions:
You have been hired as a business intelligence consultant to build an integrated portal system which handles the tasks mentioned above. You need to present the following findings and recommendations on your portal choice:

- Provide an overall architectural design in the form of a write-up and/or diagram of your portal solution. Your solution must include directions on how internal staff should use the portal. Explain how to access, search, view, enter/change orders, create reports, and utilize other features. Use this site as an example: https://www.idashboards.com/dashboard-examples/
- Additionally, specify any application(s) or tool(s) that you believe will work to increase operation efficiency, and provide a rationale behind your portal selections and the tools that are utilized.

Submission Requirements:
Your findings should meet the following requirements:

- Three to five pages (750-1,250 words) in length
- Formatted according to APA guidelines as explained in the CSU-Global Guide to Writing & APA (subheadings, one-inch margins, and double spacing)
- Supported by three credible, academic outside sources in addition to course materials
- Write clearly and logically, as you will be graded on content, analysis, and your adherence to the tenets of good academic writing, which should be succinct where possible while also exploring the topics appropriately. Integrate and cite scholarly sources to support your work, and supplement your ideas.

Part B: Getting Started with SAS
In Part B of this assignment, you will get started with SAS from the *SAS Essentials* textbook.

Instructions:

1. To begin you will need to download SAS and install it on your computer. Refer to the SAS Instructions to download, configure, and run SAS University edition on your computer.
2. Study and practice with the SAS User Interface-Run-FirstProgram document.
3. Then download the program SECOND.SAS**.**
4. Save this file in the folder you created earlier during the SAS install directions. Build your file structure like this:

   SASUniversityEdition\myfolders\sasuser.###
   (where the ### is the version number for SAS)

   You configure SAS to be able to see this folder on your hard drive while you are in SAS. It will appear in your SAS libraries under SASUSER.

5. Open and run the SAS Program in the SASUSER.### (where ### is the SAS version number) folder called:

   SECOND.SAS

6. Run the program (SECOND.SAS) below and observe the output

```
DATA EXAMPLE;
INPUT AGE @@;
DATALINES;
12 11 12 12 9 11 8 8 7 11 12 14 9 10 7 13
6 11 12 4 11 9 13 6 9 7 13 9 13 12 10 13
11 8 11 15 12 14 10 10 13 13 10 8 12 7 13
11 9 12
;
PROC MEANS;
  VAR AGE;
RUN;
```

You will get a result like this:

The SAS System
The MEANS Procedure

Analysis Variable : AGE				
N	**Mean**	**Std Dev**	**Minimum**	**Maximum**
50	10.4600000	2.4261332	4.0000000	15.0000000

Tips and Tricks for Running SAS

Within a SAS program, each statement begins with an identifying keyword (DATA, PROC, INPUT, DATALINES, RUN, etc.) and ends with a semicolon ";".

FOR EXAMPLE:

DATA TEMP;
PROC PRINT DATA=TEMP;
RUN;

******* NOTE: All three lines start with a SAS keyword

Submission Requirements:

- Take screenshots of your code and the output and put them in a Word document to include in your assignment submission.

Option #2: Manufacturing BI Use Case: Single Integrated BI Solution

This assignment has two parts, A and B.

IMPORTANT: To receive full credit, you must complete both Part A and Part B of this assignment.

Part A

You are working in a manufacturing organization and the CEO has requested to improve its data processing and handling systems. Currently the organization has some legacy systems used in six different divisions independently, and some new high-tech systems used in two other divisions. You need to provide a single-solution framework that has the following characteristics:

- Easy and secure access to data from multiple divisions
- Easy and secure access to the business intelligence (BI) system from multiple regions
- Multiple-use purpose within the organization
- Self-service capabilities
- Integrated with legacy systems to eliminate legacy systems eventually
- Integrated corporate data governance and security policies requirements
- Salable and high performance
- Single sign-on system
- Internet and intranet communication options

Instructions:
Provide an overall architectural BI ecosystem. Your designed framework solution must include the above-mentioned characteristics.

Submission Requirements:
Your solution should meet the following requirements:

- Should be in the form of a write-up with or without design diagram
- Must include the explanation of each component used in the design, and the flow of the information from one component to another and its purpose
- Be three to five pages (750-1,250 words) in length
- Formatted according to APA guidelines as explained in the CSU-Global Guide to Writing & APA (subheadings, one-inch margins, and double spacing)
- Supported by three credible, academic outside sources in addition to course materials
- Be written clearly and logically, as you will be graded on content, analysis, and your adherence to the tenets of good academic writing, which should be succinct where possible while also exploring the topics appropriately. Integrate and cite scholarly sources to support your work, and supplement your ideas.

Part B: Getting started with SAS
In Part B of this assignment, you will get started with SAS from the *SAS Essentials* textbook.

Instructions:

1. To begin you will need to download SAS and install it on your computer. Refer to the SAS Instruction Sheet to download, configure, and run SAS University edition on your computer.
2. Study and practice with the SAS User Interface-Run-FirstProgram document.
3. Download the program SECOND.SAS.
4. Save this file in the folder you created earlier during the SAS install directions:

   SASUniversityEdition\myfolders\sasuser.###
   (where the ### is the version number for SAS)

   You configured SAS to be able to see this folder on your hard drive while you are in SAS. It will appear in your SAS libraries under SASUSER.
5. Open and run the SAS Program in the SASUSER.### (where ### is the SAS version number) folder called “SECOND.SAS”
6. Run the program (SECOND.SAS) below and observe the output:

```
DATA EXAMPLE;
INPUT AGE @@;
DATALINES;
12 11 12 12 9 11 8 8 7 11 12 14 9 10 7 13
6 11 12 4 11 9 13 6 9 7 13 9 13 12 10 13
11 8 11 15 12 14 10 10 13 13 10 8 12 7 13
11 9 12
;
PROC MEANS;
  VAR AGE;
RUN;
```

- You will get a result like this:

The SAS System
The MEANS Procedure

Analysis Variable : AGE				
N	Mean	Std Dev	Minimum	Maximum
50	10.4600000	2.4261332	4.0000000	15.0000000

Tips and Tricks for Running SAS

Within a SAS program, each statement begins with an identifying keyword (DATA, PROC, INPUT, DATALINES, RUN, etc.) and ends with a semicolon ";".

FOR EXAMPLE:

DATA TEMP;
PROC PRINT DATA=TEMP;
RUN;
******* NOTE: All three lines start with a SAS keyword

Submission Requirements:

- Take screenshots of your code and the output and put them in a Word document to include in your assignment submission.

MODULE 2

Readings

- Chapter 2 in *Business Intelligence, Analytics, and Data Science: A Managerial Perspective* (4th ed.)
- Chapters 11, 12, & 13 in *SAS Essentials*
- Ferguson, B. (2014). GE and the culture of analytics. *MIT Sloan Management Review, 55*(3), 1-4.
- Martens, D., Provost, F., Clark, J., & de Fortuny, E. J. (2016, December). Mining massive fine-grained behavior data to improve predictive analytics. *MIS Quarterly, 40*(4), 869-888.
- Maté, A., Trujillo, J., Garcia, F., Serrano, M., & Piattini, M. (2016). Empowering global software development with business intelligence. *Information and Software Technology, 76*, 81-91.

Discussion (25 points)

Critical Thinking (65 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: Healthcare BI Use Case: Consolidate

This assignment has two parts, A and B.

IMPORTANT: To receive full credit, you must complete both Part A and Part B of this assignment.

Part A

A large healthcare organization has 30,000 employees and 24 mobile units operating in 15 countries, producing a large amount of data from different stationary and mobile devices. It needs a business intelligence solution.

Your job is to consolidate the effort of data processing, offering a single-solution business intelligence framework with the following requirements:

1. Data transfer from mobile units to local offices
2. Consolidating data to the headquarters
3. Data access from the mobile units
4. Easy and secure access to corporate and patient information from any site
5. Data analytics capabilities
6. Safeguarding of data

For this assignment, you will provide a BI solution guide to how this healthcare organization can implement your BI solution with the above-mentioned characteristics. You are free to design a representation of your solution in image form for clarity.

Submission Requirements

Your solution should meet the following requirements:

- Three to five pages (750-1250 words) in length
- Formatted according to APA guidelines as explained in the CSU-Global Guide to Writing & APA (subheadings, one-inch margins, and double spacing)
- Supported by two credible, academic outside sources in addition to course materials. Integrate and cite scholarly sources to support your work, and supplement your ideas.
- Write clearly and logically, as you will be graded on content, analysis, and your adherence to the tenets of good academic writing, which should be succinct where possible while also exploring the topics appropriately.

Part B: SAS code for statistical analysis test

For Part B, you will write the SAS code for a statistical analysis test by using a data file called **hsb2.sas7bdat or** any public dataset.

Instructions:

1. Review the video provided on the SAS website with an example of a t-test analysis.

2. Choose to use either **hsb2.sas7bdat or** any public dataset. Information about **hsb2.sas7bdat** is below.

   About hsb2.sas7bdat Data File
   The data file ***hsb2.sas7bdat*** contains 200 observations from a sample of high school students with demographic information about the students, such as:
3. Their gender (**female**), socioeconomic status (**ses**) and ethnic background (**race**).
4. It also contains many scores on standardized tests, including tests of reading (**read**), writing (**write**), mathematics (**math**) and social studies (**socst**).
5. Next, select either the statistical analysis test that you presented in your Module 2 discussion post, or select another statistical analysis test of your choice.
6. Run your SAS statistical analysis test using the data file called: hsb2.sas7bdat or any public dataset and post the SAS output with your submission.
   a. Make sure that you download the data file to your folder:

      SASUniversityEdition\myfolders\sasuser
      ### *where the ### is the version number for SAS.*

      You will be able to link to your SAS data table file via the SAS software if you store it there. It will appear in your SAS libraries under SASUSER.

Submission Requirements

- Take screenshots of the output and your code in a Word document to submit as Part B of this assignment.

Option #2: Healthcare BI Use Case: Data Breach BI Solution

This assignment has two parts, A and B.

To receive full credit, you must complete both Part A and Part B of this assignment.

Part A: Healthcare BI Use Case – Mobile Medical Units: Data Security

A large healthcare organization has 30,000 employees and 24 mobile units operating in 15 countries, producing a large amount of data from different stationary and mobile devices. It needs a business intelligence solution.

One of the mobile medical units has had a data breach, and your job is to provide a standardized data security and privacy solution with the following requirements:

- Data transfer from mobile units to local offices
- Consolidating data to headquarters
- Data access from the mobile units
- Easy and secure access to corporate and patient information from any site
- Data analytics capabilities
- Data recovery from the hacked mobile medical unit
- Protection of data from a future security breach
- Privacy of data with some industry standardization

Instructions:

1. For this assignment, provide a BI solution guide for handling the hacked mobile medical unit.

2. Propose a business intelligence system that will detect data impacted by the hack.

Submission Requirements

Your solution should meet the following requirements:

- Three to five pages (750 to 1,250 words) in length
- Includes data security, privacy, recovery recommendations, and the standardization(s) used in this case study
- Formatted according to APA guidelines as explained in the CSU-Global Guide to Writing & APA (subheadings, one-inch margins, and double spacing)
- Supported by two credible, academic outside resources in addition to course materials. Integrate and cite scholarly sources to support your work, and supplement your ideas.
- Write clearly and logically, as you will be graded on content, analysis, and your adherence to the tenets of good academic writing, which should be succinct where possible while also exploring the topics appropriately.

Part B: SAS Code for Statistical Analysis Test

For Part B, you will write the SAS code for a statistical analysis test by using a data file called **hsb2.sas7bdat or** any public dataset.

Instructions:

1. Review the video provided on the SAS website with an example of a t-test analysis.
2. First, choose to use either **hsb2.sas7bdat or** any public dataset. Information about **hsb2.sas7bdat** is below.

About hsb2.sas7bdat Data File

The data file ***hsb2.sas7bdat*** contains 200 observations from a sample of high school students with demographic information about the students, such as:

- Their gender (**female**), socioeconomic status (**ses**) and ethnic background (**race**).
- It also contains many scores on standardized tests, including tests of reading (**read**), writing (**write**), mathematics (**math**) and social studies (**socst**).

3. Next, select either the statistical analysis test that you presented in your Module 2 discussion post, or select another statistical analysis test of your choice.
4. Run your SAS statistical analysis test using the data file called: hsb2.sas7bdat or any public dataset and post the SAS output with your submission.
    a. Make sure that you download the data file to your folder:

    SASUniversityEdition\myfolders\sasuser
    ### *where the ### is the version number for SAS.*

    You will be able to link to your SAS data table file via the SAS software if you store it there. It will appear in your SAS libraries under SASUSER.

Submission Requirements

- Take screenshots of the output and your code in a Word document to submit as Part B of this assignment.

MODULE 3

Readings

- Chapter 3 in Business Intelligence, Analytics, and Data Science: A Managerial Perspective
- Chapter 3 in *SAS Essentials*

Discussion (25 points)

Critical Thinking (65 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: Retail BI Use Case: Analytics Application

This assignment has two parts, A and B.

IMPORTANT: To receive full credit, you must complete both Part A and Part B of this assignment.

Part A

Refer to Table 1.1 Examples of Analytics Application in the Retail Value Chain from the *Business intelligence, analytics, and data science: A managerial perspective* text, and select one of the examples of analytic applications in the retail chain.

Provide detailed information on a business intelligence solution system that answers the listed business questions for your selected analytics application. Your BI solution must be detailed and address the questions that benefit the organization and provide insight for decision making.

Submission Requirements:

Your solution should meet the following requirements:

- Three to five pages (750-1,250 words) in length
- Formatted according to APA guidelines as explained in the CSU-Global Guide to Writing & APA (subheadings, one-inch margins, and double spacing)
- Supported by three credible, academic outside sources in addition to course materials
- Write clearly and logically, as you will be graded on content, analysis, and your adherence to the tenets of good academic writing, which should be succinct where possible while also exploring the topics appropriately. Integrate and cite scholarly sources to support your work, and supplement your ideas.

Part B: SAS code – Reading and Importing Files

1. For Part B, write SAS code to perform the following tasks:

    a. Read the file called: SOMEDATA.SAS7BDAT
    b. Import an Excel data file (CSV) called: CARSMPG.CSV

2. Make sure that you download the data files to your folder in this location:

    SASUniversityEdition\myfolders\sasuser.###
    (where the ### is the version number for SAS)

You will be able to link to your SAS data table file via the SAS software if you store it there.

You will have the following result from your run when you read the file:

Variable	Label	N	Mean	Std Dev	Minimum	Maximum
ID	ID Number	50	374.22	167.4983	101	604
AGE	Age on Jan 1, 2000	50	10.46	2.426133	4	15
TIME1	Baseline	50	21.268	1.716955	17	24.2
TIME2	6 Months	50	27.44	2.659062	21.3	32.3
TIME3	12 Months	50	30.492	3.025594	22.7	35.9
TIME4	24 Months	50	30.838	3.530733	21.2	36.1
STATUS	Socioeconomic Status	50	3.94	1.331104	1	5
SEX		50	0.4	0.494872	0	1

Submission Requirements:

- Submit your SAS code, and a screenshot of the output from the runs in a Word document.

Option #2: Retail BI Use Case: Analytics Application on Real-time Data

This assignment has two parts, A and B.

IMPORTANT: To receive full credit, you must complete both Part A and Part B of this assignment.

Part A

Referring to Table 1.1 Examples of Analytics Application in the Retail Value Chain from the Sharda text, select one of the examples of analytic applications in the retail chain.

Instructions:

Discuss how to conduct business intelligence processes on real-time data. Your assignment must include the following:

- An assessment as to whether a business intelligence solution of your selected analytics application consisting of real-time data has benefits or not.
- Detailed information on your BI solution system that answers the listed business questions for the selected analytics application while using real-time data, and whether it can be used.
- Your BI solution system must combine different data sources (stored data, public data, social media, marketing initiatives data, etc.), and be easy to use with secure access globally.

Submission Requirements:

Your solution should meet the following requirements:

- Three to five pages (750-1,250 words) in length
- Formatted according to APA guidelines as explained in the CSU-Global Guide to Writing & APA (subheadings, one-inch margins, and double spacing)
- Supported by three credible, academic outside sources in addition to course materials

- Write clearly and logically, as you will be graded on content, analysis, and your adherence to the tenets of good academic writing, which should be succinct where possible while also exploring the topics appropriately. Integrate and cite scholarly sources to support your work, and supplement your ideas.

Part B: SAS code – Reading and Importing Files

1. For Part B, write SAS code to perform the following tasks:

    a. Read a file called: SOMEDATA.SAS7BDAT
    b. Import an Excel data file (CSV) called: CARSMPG.CSV

2. Make sure that you download the data files to your folder in this location:

    SASUniversityEdition\myfolders\sasuser.###
    (where the ### is the version number for SAS)

    You will be able to link to your SAS data table file via the SAS software if you store it there.

    You will have the following result from your run when you read the file "SOMEDATA.SAS7BDAT":

Variable	Label	N	Mean	Std Dev	Minimum	Maximum
ID	ID Number	50	374.22	167.4983	101	604
AGE	Age on Jan 1, 2000	50	10.46	2.426133	4	15
TIME1	Baseline	50	21.268	1.716955	17	24.2
TIME2	6 Months	50	27.44	2.659062	21.3	32.3
TIME3	12 Months	50	30.492	3.025594	22.7	35.9
TIME4	24 Months	50	30.838	3.530733	21.2	36.1
STATUS	Socioeconomic Status	50	3.94	1.331104	1	5
SEX		50	0.4	0.494872	0	1

Submission Requirements:

- Submit your SAS code, and a screenshot of the output from the runs in a Word document.

Portfolio Project Milestone (50 points)

PORTFOLIO PROJECT MILESTONE (50 points)

Choose which portfolio project you'd like to submit.

Option #1: Global Organization BI Project Proposal

Submit a one-page description about your portfolio project. Include your approach to reduce the infrastructure costs, and three to five peer-reviewed sources formatted according to CSU-Global Guide to Writing & APA.

Option #2: Factory Machines Faults Detection

Submit a one-page description about your portfolio project. Include your approach to reduce the infrastructure costs, and three to five peer-reviewed sources formatted according to CSU-Global Guide to Writing & APA.

MODULE 4

Readings

- Chapter 2, 3, & 4 of *Business Intelligence, Analytics, and Data Science: A Managerial Perspective*
- Chapter 4 in *SAS Essentials*
- Thammasiri, D., Meesad, P., Meesad, P. & Kasap N. (2014). A critical assessment of imbalanced class distribution problem: The case of predicting freshmen student attrition. *Expert Systems with Applications, 41*(2), 321-330.

Discussion (25 points)

Critical Thinking (65 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: Food & Beverage BI Use Case: Wine Recognition using SAS

The dataset used for this assignment is the Wine Recognition Dataset. Remember you must save this file in your directory that SAS can see on your hard drive.

The information on the data set can be found at this website.

The data are the results of chemical analysis of wines grown in the same region but derived from three different cultivars (plant variety).

- The analysis determined the quantities of 13 constituents found in each of the three types of wines.
- There are 178 instances in total with 59, 71, and 48 instances in class 1, class 2, and class 3, respectively.
- First attribute in the data is the class identifier (1-3)—see the information for the other attributes.

Instructions:

1. Select randomly two variables and plot the data using different colors/signs to plot the points belonging to three different classes.
    - What can you say about the class separability in this space?
2. Repeat, but this time use the two variables that you found to be the most relevant for the classification process.
    - Explain the approach you applied to select these two variables and include the analysis you performed in your answer.
3. With your write-up, submit screenshots of the steps you took and the scatterplots.
4. Your write-up must include exact steps you took to complete this assignment.
5. If you had some challenges, please state the issue(s) as well.

Submission Requirements:

Your write-up should meet the following requirements:

- Three to five pages (750-1,250 words) in length
- Include the screenshot diagram(s) of the BI solution framework

- Formatted according to APA guidelines as explained in the CSU-Global Guide to Writing & APA (subheadings, one-inch margins, and double spacing)
- Supported by three credible, academic outside sources in addition to course materials
- Write clearly and logically, as you will be graded on content, analysis, and your adherence to the tenets of good academic writing, which should be succinct where possible while also exploring the topics appropriately. Integrate and cite scholarly sources to support your work, and supplement your ideas.

Option #2: Food & Beverage BI Use Case: Wine Recognition

The dataset used for this assignment is the Wine Recognition Dataset. Remember you must save this file in your directory that SAS can see on your hard drive.

The information on the data set is found at this website.

The data are the results of chemical analysis of wines grown in the same region but derived from three different cultivars (plant variety).

- The analysis determined the quantities of 13 constituents found in each of the three types of wines.
- There are 178 instances in total with 59, 71, and 48 instances in class 1, class 2, and class 3, respectively.
- First attribute in the data is the class identifier (1-3)—see the information for the other attributes.

Instructions:

1. Select randomly two variables and plot the data using different colors/signs to plot the points belonging to three different classes.
    - What can you say about the class separability in this space?
2. For this part, you can select one of these options:

    - Option 1: Create scatterplots for class 1 instances vs. the independent variable class 3.
        - What conclusions can you draw about the relationships between class 1 instances and the independent variables class 3?

    - Option 2: Select different variables and create scatterplots for the variables you have selected.
        - What conclusions can you draw about the relationships between the two variables?

3. Submit with your write-up, screenshots of your steps and the scatterplots.
4. Your write-up must include exact steps you took to complete this assignment.
5. If you had some challenges, please state the issue(s) as well.

Submission Requirements:

Your write-up should meet the following requirements:

- Three to five pages (750-1,250 words) in length
- Include the screenshot diagram(s) of the BI solution framework

- Formatted according to APA guidelines as explained in the CSU-Global Guide to Writing & APA (subheadings, one-inch margins, and double spacing)
- Supported by three credible, academic outside sources in addition to course materials
- Write clearly and logically, as you will be graded on content, analysis, and your adherence to the tenets of good academic writing, which should be succinct where possible while also exploring the topics appropriately. Integrate and cite scholarly sources to support your work, and supplement your ideas.

MODULE 5

Readings

- Chapters 3 & 5 of *Business Intelligence, Analytics, and Data Science: A Managerial Perspective*
- Chapter 4 in *SAS Essentials*
- Stieglitz, S., Dang-xuan, L., Bruns, A., & Neuberger, C. (2014). Social media analytics. *Business & Information Systems Engineering, 6*(2), 89-96.

Discussion (25 points)

Critical Thinking (65 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: Education BI Use Case: Student Retention & Reducing Costs

This assignment has two parts, A and B.

IMPORTANT: To receive full credit, you must complete both Part A and Part B of this assignment.

Part A

In this assignment, you will submit a business intelligence solution framework for a university with one online and two physical campuses. The solution will be used by university executives to improve overall student retention and overhead costs.

Instructions:

1. The BI solution must:

    - Provide real-time data access
    - Access historical institutional data from student databases from the past 15 years
    - Have analytic capabilities to combine data sources (i.e., students' data, course registrations, online/on-campus data, dates of course offerings, etc.)
    - Have the ability to predict students likely to drop out
    - Have easy and secure access to data from multiple divisions within the university departments
    - Have BI dashboards to present and view the results
    - Have model(s) (such as: artificial neural networks [ANN], Support Vector Machine [SVM], and Linear Regression [LR] models) you recommend using and their rationale
    - You will use SAS code for the model(s) that you will use for this BI framework solution.
        - FOR EXAMPLE: if you're using ANN model, write/locate ANN SAS code to include in your submission.

2. Explain in detail how your BI framework solution will work with the above-mentioned characteristics to help executives improve decision making. The executives are the CEO and president level as well as the vice presidents of different departments. Each department will focus on its own data while top executives will focus on the overall university total retention and costs.

Submission Requirements:

Your framework should meet the following requirements:

- Three to five pages (750-1,250 words) in length
- Include the screenshot diagram(s) of the BI solution framework
- Formatted according to APA guidelines as explained in the CSU-Global Guide to Writing & APA (subheadings, one-inch margins, and double spacing)
- Supported by three credible, academic outside sources in addition to course materials
- Write clearly and logically, as you will be graded on content, analysis, and your adherence to the tenets of good academic writing, which should be succinct where possible while also exploring the topics appropriately. Integrate and cite scholarly sources to support your work, and supplement your ideas.

Part B: SAS Code – Conditional Situations

For the Part B of this assignment, read certain records to create a new SAS data set called: MYDATA. Subjects less than or equal to 10 years are included in the data set named MYDATA.

1. Use the EXAMPLE.DAT file as the Input data file.

2. Save this file in your directory that SAS can see on your hard drive.

3. Using the SAS code below, view the file created in your Library and see that it works.

   Here is the SAS code:

```
*******************************************************
* This SAS code is an example from the text                    *
* SAS ESSENTIALS 2nd Ed, Wiley                *
* (C) 2016 Elliott, Alan C. and Woodward, Wayne A.    *
*******************************************************;
* This example illustrates finding the FIRST and LAST values in a group;
DATA MYDATA;
* Your INFILE statement will vary based on your directory
INFILE '/folders/myfolders/sasuser.v94/EXAMPLE.DAT';
INPUT   ID  $ 1-3 GP $ 5 AGE 6-9 TIME1 10-14 TIME2 15-19;
IF AGE LE 10;
PROC PRINT DATA=MYDATA;
RUN;
TITLE;FOOTNOTE;
```

3. Run this program.
4. State your understanding of the result and take a screenshot of the result for this assignment submission.

Submission Requirements:

- In a Word document, include your statements of understanding and a screenshot of the result.

Option #2: Education BI Use Case: Theater and Music Department Revenue

This assignment has two parts, A and B.

IMPORTANT: To receive full credit, you must complete both Part A and Part B of this assignment.

Part A

The department of theater and music at a university is interested in increasing its revenue from plays and musical events in order to fund scholarships.

Instructions:

1. For this assignment, present a business intelligence solution framework with the following characteristics:

    - Using data from all different sources
    - Providing real-time data access
    - Having access to historical institutional data from ticket sales, and fan databases for the past 10 years
    - Having analytics capabilities to combine data sources
    - Capable of predicting and explaining the increase ticket costs and ticket sales based on different seasonal events
    - Describe what model(s) (such as: artificial neural networks [ANN], Support Vector Machine [SVM], and Linear Regression [LR] models) you recommend using and why.
    - You will use SAS code for the model(s) that you will use for this BI framework solution. For example: if you're using ANN model, write/locate ANN SAS code to include in your submission.

2. Explain in detail how your BI framework solution will work with the above-mentioned characteristics to help the Theater and Music Department to increase their revenue from different sources.

Submission Requirements:

Your framework should meet the following requirements:

- Three to five pages (750-1,250 words) in length
- Include the screenshot diagram(s) of the BI solution framework
- Formatted according to APA guidelines as explained in the CSU-Global Guide to Writing & APA (subheadings, one-inch margins, and double spacing)
- Supported by three credible, academic outside sources in addition to course materials
- Write clearly and logically, as you will be graded on content, analysis, and your adherence to the tenets of good academic writing, which should be succinct where possible while also exploring the topics appropriately. Integrate and cite scholarly sources to support your work, and supplement your ideas.

Part B: SAS Code – Conditional Situations

For the Part B of this assignment, you will read certain records to create a new SAS data set called: **MYDATA**. Subjects less than or equal to 10 years are included in the data set named MYDATA.

Instructions:

1. Use the EXAMPLE.DAT file as the Input data file.

2. Save this file in your directory that SAS can see on your hard drive.

3. Using the SAS code below, view the file created in your Library and verify that it works. Here is the SAS code:

```
**********************************************************
* This SAS code is an example from the text                *
* SAS ESSENTIALS 2nd Ed, Wiley                *
* (C) 2016 Elliott, Alan C. and Woodward, Wayne A.    *
**********************************************************;
* This example illustrates finding the FIRST and LAST values in a group;
DATA MYDATA;
* Your INFILE statement will vary based on your directory
INFILE '/folders/myfolders/sasuser.v94/EXAMPLE.DAT';
INPUT   ID  $ 1-3 GP $ 5 AGE 6-9 TIME1 10-14 TIME2 15-19;
IF AGE LE 10;
PROC PRINT DATA=MYDATA;
RUN;
TITLE;FOOTNOTE;
```

4. Run this program.
5. State your understanding of the result and take a screenshot of the result for this assignment submission.

Submission Requirements:

- Include all of items in Instructions in a Word document for submission.

<u>Portfolio Milestone (100 points)</u>

Global Organization BI Project Proposal

Submit an outline of your Portfolio Project. Before you begin, it will be to your benefit to review the Functional Requirement Document available in the module section as it will help you organize for you portfolio project.

Submission Requirements:

Review the requirements of the project in Module 8 and complete an outline that meets the following criteria:

- The outline for your project must include all the heading and sub-headings.
- Your outline should be 1 to 2 pages in length.
- Within your outline, please include a list of at least five proposed peer-reviewed sources that conform to the CSU-Global Guide to Writing & APA.
- Be sure to use your instructor's feedback in the final version of the Portfolio Project assignment.

MODULE 6

Readings

- Chapters 2, 6, & 8 in *Business Intelligence, Analytics, and Data Science: A Managerial Perspective*
- Chapters 4, 5, 6, 7, & 8 in *SAS Essentials*
- De Ville, B., Neville, P., & SAS, I. (2013). *Decision trees for analytics: Using SAS enterprise miner*. Cary, N.C.: SAS Institute. (Please read only: Chapter 2, pages 16 to 37.)
- Phillips-Wren, G., Carlsson, S., RespiÌcio, A., & BreÌzillon, P. (Eds.). (2014). DSS 2.0 - Supporting decision making with new technologies. Amsterdam: IOS Press. (Please read only Chapter VI.)

Discussion (25 points)

Critical Thinking (65 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: Agriculture - BI Use Case: Farm to Market

This assignment has two parts, A and B.

IMPORTANT: To receive full credit, you must complete both Part A and Part B of this assignment

Part A

In this assignment, you will plan and design a BI solution framework for a large farming company to streamline its farming products ordering and deliveries to the market (wholesale markets and large grocery stores).

Instructions:

Your BI solution must include:

- Data accessed from different sources and historical data
- Real-time data capable of predicting products ordering
- Price adjustment ability based on market and environment change
- Records of past delivery methods, and ability to modify delivery methods for customers
- Online ordering and delivery system
- One single system for ordering and tracking

Submission Requirements:

Your framework should meet the following requirements:

- Three to five pages (750-1,205 words) in length
- Formatted according to APA guidelines as explained in the CSU-Global Guide to Writing & APA (subheadings, one-inch margins, and double spacing)
- Supported by three credible, academic outside sources in addition to course materials
- Write clearly and logically, as you will be graded on content, analysis, and your adherence to the tenets of good academic writing, which should be succinct where possible while also exploring the topics appropriately. Integrate and cite scholarly sources to support your work, and supplement your ideas.

Part B: Cleaning Messy Data Set

For the Part B of this assignment, you will clean up messy data. Messy data means those data sets that are not quite ready for analysis, such as blank or multiple answers in columns that should have one answer, non-number values for a cell in a table, and missing data.

You can correct these issues by using SAS code.

Instructions:

1. Download the messydata.sas7bdat needed. Make sure that you download the data files to your folder in this location:

   SASUniversityEdition\myfolders\sasuser.###

   (where the ### is the version number for SAS)
2. You will be able to link to your SAS data table file via the SAS software if you store it there. This directory is the SASUSER Library in the University Edition of SAS Studio.
3. Copy and paste the following code into SAS Studio. Included in the code is a procedure to attach labels to the variable to make the output more readable.

```
* (C) 2016 Elliott, Alan C. and Woodward, Wayne A.    *
*****************************************************;

* This example illustrates Cleaning a MESSY data file;
*****************************************************************;
STEP 1;
* THIS CODE MAKES A COPY OF THE ORIGINAL FILE;
* SO ALL CHANGES ARE MADE IN A COPY OF THE DATA SET;

DATA WORK.CLEANED;SET SASUSER.MESSYDATA;
LABEL
EDUCATION='Years of Schooling'
HOW_ARRIVED='How Arrived at Clinic'
TOP_REASON='Top Reason for Coming'
SATISFACTION='Satisfaction Score'
Subject="Subject ID"
DateArrived="Date Arrived"
TimeArrive="Time Arrived"
DateLeft="Date Left"
TimeLeft="Time Left"
Married="Married?"
Single="Single?"
Age="Age Jan 1, 2014"
Gender="Gender"
Race="Race"
Satisfaction="Satisfaction Score";

        * You don't really need the ARRIVAL Label;
TEMP=ARRIVAL;
DROP ARRIVAL;
```

```
LABEL TEMP='Arrival Temperature';
RUN;
* the code that shows the first 10 records:
PROC PRINT LABEL
DATA=WORK.CLEANED
(firstobs=1 obs=10);
VAR  SUBJECT EDUCATION TEMP
TOP_REASON SATISFACTION;
RUN;

TITLE;FOOTNOTE;
```

4. Run the code.
5. In the WORK library, save the changes in a file named "CLEANED."

Submission Requirements:

- For the Part B of this assignment, you will submit the following:
    - your SAS code,
    - a screenshot of the output from the run, and
    - a screenshot of the Output Data.
- Also, state other steps necessary for cleaning a data set beyond these steps in this assignment.

Option #2: Agriculture - BI Use Case: Agriculture Sales Prediction

This assignment has two parts, A and B.

IMPORTANT: To receive full credit, you must complete both Part A and Part B of this assignment.

Part A

A large agriculture company needs a BI system to make all different sources of data available to managers in a single viewable system.

The BI system is a dashboard project, which means having the key performance measures and analytical data available for view through the dashboard. This BI system will be used by managers who can look forward into data, adjust data for better products positioning, and streamline the delivery timeline by geographical distance, determine how sales vary by regions, identify the specific needs of customers and customers' complaint locations, and easily trace them back to the products to better target their prospects. The managers must be able to generate reports for their scenarios forward looking from the dashboard.

Instructions:

For this assignment, design a BI solution framework with a viewable dashboard that combines location, weather, soil and crop-related data, precise irrigation and fertilizer, customer data, past farm products sales, regional information, past delivery methods to their customers, and geospatial data to predict sale of agricultural products.

Submission Requirements:

Your project should meet the following requirements:

- Three to five pages (7500-1,250 words) in length
- An image(s) of the design layout and dashboard
- Formatted according to APA guidelines as explained in the CSU-Global Guide to Writing & APA (subheadings, one-inch margins, and double spacing)
  Supported by three credible, academic outside sources in addition to course materials
- Write clearly and logically, as you will be graded on content, analysis, and your adherence to the tenets of good academic writing, which should be succinct where possible while also exploring the topics appropriately. Integrate and cite scholarly sources to support your work, and supplement your ideas.

Part B: Cleaning Messy Data Set

For the Part B of this assignment, you will clean up messy data. Messy data means those data sets that are not quite ready for analysis, such as blank or multiple answers in columns that should have one answer, non-number values for a cell in a table, and missing data.

You can correct these issues by using SAS code.

Instructions:

1. Download the messydata.sas7bdat needed.
2. Make sure that you download the data files to your folder in this location:

   SASUniversityEdition\myfolders\sasuser.###
   where the ### is the version number for SAS.

3. *Link to our SAS data table file via the SAS software if you store it there. This directory is the SASUSER Library in the University Edition of SAS Studio.*

4. Copy and paste the following code into SAS Studio. Included in the code is a procedure to attach labels to the variable to make the output more readable.
   •

```
* (C) 2016 Elliott, Alan C. and Woodward, Wayne A.    *
*******************************************************;
* This example illustrates Cleaning a MESSY data file;
*************************************************************;
STEP 1;
* THIS CODE MAKES A COPY OF THE ORIGINAL FILE;
* SO ALL CHANGES ARE MADE IN A COPY OF THE DATA SET;
DATA WORK.CLEANED;SET SASUSER.MESSYDATA;
LABEL
EDUCATION='Years of Schooling'
HOW_ARRIVED='How Arrived at Clinic'
TOP_REASON='Top Reason for Coming'
SATISFACTION='Satisfaction Score'
Subject="Subject ID"
DateArrived="Date Arrived"
TimeArrive="Time Arrived"
```

```
DateLeft="Date Left"
TimeLeft="Time Left"
Married="Married?"
Single="Single?"
Age="Age Jan 1, 2014"
Gender="Gender"
Race="Race"
Satisfaction="Satisfaction Score";
        * You don't really need the ARRIVAL Label;
TEMP=ARRIVAL;
DROP ARRIVAL;
LABEL TEMP='Arrival Temperature';
RUN;
* the code that shows the first 10 records:
PROC PRINT LABEL
DATA=WORK.CLEANED
(firstobs=1 obs=10);
VAR  SUBJECT EDUCATION TEMP
TOP_REASON SATISFACTION;
RUN;
TITLE;FOOTNOTE;
```

5. Run the code.
6. In the WORK library, save the changes in a file named "CLEANED."

Submission Requirements:

- For the Part B of this assignment, you will submit the following:
    - your SAS code,
    - a screenshot of the output from the run, and
    - a screenshot of the Output Data.
- Also, state other steps necessary for cleaning a data set beyond these steps in this assignment.

MODULE 7

Readings

· Chapter 3, 6, & 7 of *Business Intelligence, Analytics, and Data Science: A Managerial Perspective*

Discussion (25 points)

Critical Thinking (60 points)

For this assignment, you will research potential career and internship opportunities that may include business intelligence as a requested or required skillset.

Instructions:

- Copy and include some of the ads, if possible.
- As you look for these positions, make notes of any educational requirements or specific certifications that are required or recommended.
- Include in your research, articles about the job duties and responsibilities of a position in business intelligence.
- What did you see that really interested you in learning more about a career in business intelligence?
- Did you find out anything about a career in business intelligence that concerned you?

Submission Requirements:
You will report your research in a one- to two-page paper that meets the following requirements:

- Includes your initial research findings on your opportunities in the business intelligence field.
- Formatted according to the CSU-Global Guide to Writing and APA

MODULE 8

Readings

- Chapter 8 in *Business Intelligence, Analytics, and Data Science: A Managerial Perspective*
- Horvitz, E. & Mulligan, D. (2015). Data, privacy, and the greater good. *Science, 349*(6245), 253-255. Retrieved from http://erichorvitz.com/data_privacy_greater_good.pdf
- Jain, P., Sharma, P., & Jayaraman, L. (2014). *Behind every good decision: How anyone can use business analytics to turn data into profitable insight.* New York: AMACOM. (Please read only Section 4.)
- Tole, A. A. (2015). Cloud computing and business intelligence. *Database Systems Journal, 5*(4), 49-58. Retrieved from http://www.dbjournal.ro/archive/18/18_5.pdf

Discussion (25 points)

Portfolio Project (200 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'll be graded on your project.

Option #1: Global Organization BI Project Proposal

Organizations race to unlock the value in the vast amount of data their business produces. Propose a business intelligence solution that helps solve the challenges associated with large amounts different types of data, from a variety of sources for the hypothetical organization indicated below.

The organization has the following characteristics:

- Is global
- Has multiple websites in 20 different languages
- Lists more than 50,000 products
- Has 1,100 offices worldwide
- Plans to expand to an additional 2,000 locations in the immediate future

The organizational BI proposal design must address the characteristics mentioned above, as well as the following:

- Provide massive computing and analytics capabilities
- Supply an easy-to-use user interface
- Provide scalable and secure systems
- Promote fast communication and collaboration capabilities
- Analyze high volumes of data
- Receive data from connected devices
- Reduce infrastructure costs
- Interconnect with a data warehouse
- Deliver Cloud-based access

Instructions:
Your proposed BI system must be presented in a Functional Requirements Document that describes every section how this proposed BI system must work.

Your document must include:

- Introduction (such as: purpose, scope, system description, points of contact, document references, and glossary)
- Assumptions and constraints
- Context
- Specific function-related requirements for how the system will work and its features
- Interface requirements (a dashboard layout design) that demonstrates how this BI system would operate and what it might look like
- Data requirements
- Operational requirements
- User permissions and modes of operation
- Tools and environments necessary for use
- Users access and interactions
- Technologies and tools that are needed to integrate to the proposed BI system
- An explanation of how—and what will be needed—to have a secure and scalable BI system
- Detailed information about the overall purposed BI design with diagrams(s) of components connections and data flow
- An outline of detailed information on how this BI system can be used by all within the organization from any place
- An incorporated collaboration and communication system
- Information on approach(s) to reduce infrastructure costs

Submission Requirements:
- Your completed Functional Requirements Document should be six to eight pages (1,500-2,000 words) in length, complete with a title page, table of contents, and a minimum of five peer-reviewed references.
- The CSU-Global Guide to Writing & APA will help you with formatting.
- To help you stay organized, there are two milestones to help you build your proposal. You can find the detailed descriptions of these portfolio milestones in Module 3 and Module 5.

Option #2: Factory Machines Faults Detection

Business intelligence is used in many industries to improve processes. In this assignment, you will apply a business intelligence solution to detect flaws in a hypothetical factory line prior to parts-related issues slowing production.

The factory has the following characteristics:

- Produces auto parts for eight different automobile manufacturers (Ford, Toyota, Chevy, etc.)
- Receives orders online all the time, in no predictable time frame
- The orders vary; some may be for 10,000 parts whereas others are for 800,000 parts

- The assembly line produces 5,000 parts per day
- There are five different types of large assembly machines on the floor. They are connected and work together as a unit. Parts begin on the first assembly line, and move to the next until the fifth assembly line, which is the finishing line, where the parts are completed.
- During daily operations, parts could become unusable due to wear and tear or improper usage.

Taking into account the factory characteristics above, the BI design for the factory must also be able to detect any defects in any assembly machines, and address the following requirements:

- Provide an easy-to-use user interface
- Supply scalable and secure systems
- Be interconnected to a data warehouse
- Receive data from sensors on the assembly lines, and the interconnected devices
- Receive data from the connected devices
- Furnish real-time data and ensure stationary data is collected, used, and stored by your cloud-based BI system
- Utilize massive computing and analytic capabilities analyzing high volume of data
- Be equipped with continuous real-time monitoring to predict down time and potential problems
- Provide insight from sensor data to guide equipment usage, and schedule for the highest throughput
- Have the ability to pinpoint answers related to any issues, such as:
    - Why the line has stopped
    - Part failure
    - Electrical, overheating, or weather issues
    - History of other assembly line (machines) shutdowns
    - Scheduled services reports
    - Indicators when scheduled service was missed

Instructions:
Your proposed BI system must be presented in a Functional Requirements Document that describes every section of how this proposed BI system must work.

Your document must include:

- Introduction (such as: purpose, scope, system description, points of contact, document references, glossary, etc.)
- Assumptions and constraints
- Context
- Specific function-related requirements for how the system will work and its features
- Interface requirements (a dashboard layout design of how this BI system could be used and what the display might look like)
- Data requirements
- Operational requirements
- User permissions and modes of operation
- Tools and environments to be used
- User access and system interactions
- Technologies and tools needed to integrate into the BI system
- Details on what will be needed to have a secure and scalable BI system
- Information about the overall purposed BI design with diagrams(s) of components, connections, and data flow

Submission Requirements:

- Your complete proposal should be six to eight pages (1,500-2,000 words) in length, complete with a title page, table of contents, and a minimum of five peer-reviewed references.
- The CSU-Global Guide to Writing & APA will help you with formatting.
- To help you stay organized there are two milestones that you use to help build your proposal. You can find the detailed descriptions of these portfolio milestones in Module 3 and Module 5.

COURSE POLICIES

Course Grading

20% Discussion Participation
45% Critical Thinking Assignments
35% Final Portfolio Project

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

IN-CLASSROOM POLICIES

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 Requirements* 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 Requirements* when citing in APA (based on the APA Style Manual, 6th edition) for all assignments. For details on CSU-Global APA style, please review the APA resources within the CSU-Global Library under the "APA Guide & Resources" link. A link to this document 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.

SAS Resources and Information on Certification

Information about SAS Certification

Taking SAS certification exams help you validate your skills and increase your value to an employer. You can choose SAS certifications across many subjects, including programming, data management, and analytics, to name a few. For more information on SAS certification go here: https://www.sas.com/en_us/certification.html. All students, teachers, professors or staff associated with an academic institution qualify for 50% discount on all SAS certification exams. Please contact certification@sas.com to receive the discount code that will reduce the exam fee by 50% during the registration process.

Resources for Learning SAS

SAS Certification Prep Guides: https://www.sas.com/store/books/categories/certification-guide/cBooks-cbooks_categories-cbooks_categories_12-p1.html
Visit SAS Communities Visit our online sites to share and connect with other SAS users and build your SAS skills. Don't miss key communities including: SAS Certification, SAS Training, SAS Academy for Data Science, SAS Programming, New SAS User, SAS Analytics U and SAS Viya for Learners. https://communities.sas.com/t5/Learn-SAS/ct-p/learn