MSOM 621: Business Analysis and Modeling

Prerequisite(s): None

Credits: 3

I. Course Description

This course teaches professional competence in business analysis and modeling, including: linear programming, goal programming, inventory, simulation modeling and the information systems used in decision-making and analysis. Students will learn to use problem solvers for optimization and simulation. Students will learn about approaching a problem from a model viewpoint, using tools to assess a problem, apply creative thinking along with data to solve a business issue and measure and improve performance or processes. Students will apply analytics to problems using models to solve real world issues.

II. Course Objectives

1. Demonstrate an understanding of business analysis and modeling
2. Develop recommendations for modeling that can be used in decision-making and analysis.
3. Explain how to solve problems using a model viewpoint
4. Analyze the use of tools to assess and solve problems
5. Explain the process of improving performance and processes
6. Develop an understanding of how to use creative thinking along with analytics to solve business issues
7. Explain how to use problem solvers for optimization and simulation
8. Demonstrate an understanding of applying analytics to problems using models

III. Course Textbooks and Readings

Students must purchase in advance texts and/or materials for this course.

> ### Essentials of Business Analytics, 1st edition
> Authors: J. Camm, J. Cochran, M. Fry, J. Ohlmann, D. Anderson, D. Sweeney, & T. Williams
> Publisher: Cengage
> ISBN: 9781285187273
>
> ### Management by Proverbs: Scriptural Wisdom for Superior Results
> Author: Michael Zigarelli
> Publisher: Xulon Press June 2020
> ISBN: 9780578718217

IV. Weekly Information

Module One – Week 1

Introduction to Business Analysis and Modeling

Objectives

At the end of this module, you should be able to:

    1.1 Describe the different types of decisions

    1.2 Outline the process of business analytics

    1.3 Define the categories of analytical methods and models

Reading

Chapter 1 - *Essentials of Business Analytics*

Lecture
Chapter 1 PowerPoint

Deliverables

Discussion: Introduction
Discussion: Manager's Decision Making

Module Two – Week 2

Data

Objectives

At the end of this module, you should be able to:

    2.1 Describe the types of data

    2.2 Identify measures of location and measures of variability

    2.3 Outline the principles of tables and charts

Reading

Chapters 2 and 3 - *Essentials of Business Analytics*
Principles 6 and 7 in Part 2 - *Scriptural Wisdom for Superior Results*

Lecture
Chapters 2 and 3 PowerPoint

Deliverables

Discussion: Benefits of Tables
Part I of Course Project: Selection of course project and outline
Assignment: Word Problems (13 word problems on descriptive statistics and data visualization)

Module Three – Week 3

Regression Models and Forecasting

Objectives

At the end of this module, you should be able to:

3.1 Describe how to use regression models to solve problems

3.2 Describe categorical independent variables

3.3 Define what a confidence interval is and its role in hypothesis testing

3.4 Outline the process of using regression analysis for forecasting

Reading

Chapters 4 and 5 - *Essentials of Business Analytics*
Principles 8 and 9 in Part 2 - *Scriptural Wisdom for Superior Results*

Lecture
Chapters 4 and 5 PowerPoint

Deliverables

Discussion: Management by Proverbs (Planning)
Written Assignment: Case Study (3-5 page case study on forecasting)

Module Four – Week 4

Data Preparation

Objectives

At the end of this module, you should be able to:

4.1 Describe the process of data preparation

4.2 Describe the components of unsupervised and supervised learning

4.3 Outline the process for building spreadsheet models

Reading

Chapters 6 and 7 - *Essentials of Business Analytics*
Principle 10 and the case study in Part 2 - *Scriptural Wisdom for Superior Results*

Lecture
Chapters 6 and 7 PowerPoint

Deliverables

Discussion: Decisions and Variables
Assignment: Word Problems (13 word problems on data mining and spreadsheet models)
Part II of Course Project

Module Five – Week 5

Optimization Models

Objectives

At the end of this module, you should be able to:

5.1 Describe the simple maximization problem

5.2 Describe the use of linear optimization models

5.3 Discuss the types of integer linear optimization models

Reading

Read Chapters 8 and 9 - *Essentials of Business Analytics*

Lecture

Chapters 8 and 9 PowerPoint

Deliverables

Discussion: Management by Proverbs (Executing with Excellence)
Discussion: Capital Budgeting Problem
Written Assignment: Case Study (3-5 page case study on investment strategy using optimization models)

Module Six – Week 6

Monte Carlo Simulation

Objectives
At the end of this module, you should be able to:

6.1 Describe the use of nonlinear optimization models

6.2 Describe the Monte Carlo Simulation

Reading

Read Chapters 10 and 11 - *Essentials of Business Analytics*

Lecture

Chapters 10 and 11 PowerPoint

Deliverables

Discussion: Data Mining Techniques
Discussion: Monte Carlo Simulation
Written Assignment: Case Study (3-5 page case study on Monte Carlo Simulation)

<u>**Module Seven – Week 7**</u>

Problem Formulation

Objectives

At the end of this module, you should be able to:

7.1 Describe the use of problem formulation

7.2 Explain the differences of decision analysis without probabilities and with probabilities

Reading

Read Chapter 12 - *Essentials of Business Analytics*

Lecture

Chapter 12 PowerPoint

Deliverables

Discussion: Management by Proverbs (Golden Rule)
Discussion: Business Analytics and Decisions
Final Part of Course Project

<u>**V. Course Project**</u>

Overview
This project supports all the course objectives and requires the student to apply all of the critical thinking principles and methodologies learned throughout the course.
- Each of the three parts will be added to each other to make one large, complete paper.
- Part I (Modules 1-2; due in Week 2) – Includes outline of the project
- Part II, with Part I corrections (Modules 3-4; due in Week 4) – Includes 15-20 pages of course project
- The final paper will be submitted the final week of class and includes Part I, Part II, and Part III. (Modules 5-7; due in Week 7) – Includes complete course project with 28-30 pages (not including title page and reference page)
- The professor will grade each part independently and it will be up to the student to correct prior parts with the feedback from the professor. For example, when the student submits Part II, they will also include the correct Part I basis the professors comments.

- The final paper will have Part III and the corrected versions of Part I and Part II.

Submission Requirements
- The paper must follow APA 6th edition formatting with a cover page and reference page
- The paper is to be written in Time New Roman, 12-point font and double spaced
- Submit your paper to the Dropbox by the end of the indicated module
- A minimum of three peer-reviewed sources must be used per module. Appropriate research materials can be found at the CSU Online Library.
- Please submit your paper using this file name format – LastnameFirstinitialPart #.docx_For example: **DoeJPartI.docx** would be the proper format for John **Doe's** file submission for **Part I**

Details

For the course project, you will examine either a problem or an issue using business analysis and the various tools that you have learned in this course. You must choose a problem or issue that is very specific, focused on one area, and also an area that you have a solid understanding of the inputs, processes, and outputs. This is not required, but it would be beneficial to you used a specific problem or issue in your workplace. This would allow you to put into practice the theories and analyses that you have learned in this course. You would also be able to improve this area in your workplace.

You will work on this project throughout the course and will use the various tools, concepts, and applications that you learn in each module and apply them to this course project. You will also use the key concepts from the textbook that we have discussed in terms of key components of business analysis. Specifically, your course project should contain the following details:

- Introduction/Executive Summary: This section should describe the problem or issue that you have identified. You should provide a clear understanding of the inputs, outputs, and processes of this area. Finally, you should include a summary of the entire project within the executive summary.

- Description of Problem: Provide detailed information on the problem or issue and why this is an area of importance to fix. Include specific information as to who uses this process, what areas of the business operations need this process, and why has this become an issue or problem.

- Methodology: Discuss the possible alternatives for solving this problem or issue

- Data collection: What type(s) of data do you need? How you will collect this data?

- Data Analysis: Discuss how you will complete the data analysis and discover the necessary means to solve this problem or issue

- Conclusion/Recommendations: Provide a complete summary of your recommendations for implementing a "fix" to this problem or issue. In addition, explain how the recommendations should be implemented. This should be your interpretation of the analysis. Your next steps should be logical to the situation and to the organization.

Your final course project should be similar to the style of the case studies that you have read in the textbook. The introduction is the first part of the case. The remainder of the case studies contains the details of how the data was collected and how the data analysis was completed. The ending should include the findings and recommendations.

Your submission should be approximately 28-30 pages in length; not including the title page and reference page. You are required to use at three sources per module; a minimum of 21 sources.

Part 1: You will submit an outline of the project. Your outline should include the company you have chosen to use for this project and the problem or issue you will analyze and provide recommendations for solving. In addition, your outline should include an overview (at a minimum) of the elements described above. **Part 1 is due at the end of Week Two.**

Part 2: You will submit approximately 15-20 pages of your course project. This submission should be comprehensive and include most of the elements described above. Changes or revisions will be provided by your instructor based on your submission. **Part 2 is due at the end of Week Four.**

Part 3: You will submit your final course project. The final course project should be at least 28-30 pages in length and include a title page and a reference page. In addition, your final submission should reflect any recommended changes to Parts 1 and 2 based on feedback from your instructor. **Part 3 is due at the end of Week Seven.**

VI. Course Information and Grading

Course Requirements (Weekly)
Each module will be based on the inclusion and grading of the following segments. The overall program outcomes will be measured based on the following standardized grading scale percentages.

39% Case Study/Word Problem Assignments
39% Course Project
22% Discussion Boards
_____
100 %

Class Discussions

Successful online learning requires active and meaningful participation in the Discussion Board Forum. Critical thinking, appropriate use of judgment and professional comments are required for all responses. Simple agreement or disagreement with a fellow student does not constitute a quality response. Student opinions are important but must be supported by relevant data obtained in the literature or text.

1. One initial discussion board post is due by the fourth day (Thursday @ 11:59 pm) of each weekly module and two response posts are due by the last day (Sunday @ 11:59 pm) of each weekly module.
    a. Undergraduate Word Count Requirements:
        i. Initial post must be >200 words

        ii. Responses must be >150 words
   b. Graduate Word Count Requirements:
        i. Initial post must be >250 words
        ii. Responses must be >200 words

2. Participation – <u>Students must meet initial and response post deadlines to be eligible for full points</u>. Late initial posts may be accepted with a 33% reduction in the overall score assessed for each day late. Two response posts are required. If only one is received, then the overall score will be reduced by 25%. If no response posts are received, then the overall score will be reduced by 50%.

3. Students should be respectful and write in a proper and professional manner.

Please refer to the Discussion Board Rubric located within course syllabus for specific requirements and guidance on delivering a substantial discussion.

Late and Make-up Assignments

All deliverables are due by 11:59 PM on the due dates indicated. When substantive emergencies occur, acceptance of late submissions is left to the discretion of the course instructor.

Assignments that are submitted after the due date <u>with prior written approval</u> (text or email) from the instructor may receive the following deductions:

1. Late assignments are subject to a deduction of 10% of the available points for each day late.

2. Assignments submitted later than one week after due date will not be accepted and will receive a zero (0).

3. No work may be submitted after the last day of the course.

4. See Class Discussions for late discussion post policy.

Written Work

- All graded assignments must be typewritten, as designated by the professor of record for the course.
- All referenced materials must be presented according to the Publication Manual of the American Psychological Association (APA), based on the most current published edition. (current, 7th edition) (Except for English courses that specify use of MLA format.)
- All required written assignments are due on the last night of each lesson week at 11:59pm EST. This information is included in the course scheduler and calendar of every course.
- All written and graded assignments are considered the property of the College of Adult and Professional Studies and should be returned to the appropriate professor of record for the related course.
- SafeAssign may be used to check for plagiarism.

Grading Scale and Assigned Letter Grades

The College of Adult and Professional Studies follows the following numerical and letter grading scale. Grades will be posted by the Sunday night following the closing of the module. No grades will be given to students over the phone.

A: 930 - 1,000 points
B+: 900 - 929 points
B: 830 - 899 points
C: 750 - 829 points
F: 0 - 749 points

Discussion Board Rubric – Introduction (First week only)

Criteria	Minimal	Effective
Percent Possible: 0 or 50 Initial Post Introduction.	Percent Possible: 0 No post or did not follow in-structions at all.	Percent Possible: 50 Posted following instructions.
Percent Possible: 0 or 50 **Response Posts** Welcome.	Percent Possible: 0 No post or did not follow in-structions at all.	Percent Possible: 50 Posted following instructions.

Discussion Board Rubric - Initial Post

Initial Post Rubric	Minimal	Competent	Effective	Mastery
Grade	**0-74%**	**75-82%**	**83-92%**	**93-100%**
Content	• Provides weak contribution to the discussion board • Does not convey concept understanding • Shows evidence of critical thought but is not concise or complete	• Makes mostly complete response to the questions • Mostly restatement of materials • Conveys thoughts adequately; however, need to further develop critical aspects	• Advances the discussion and body of knowledge providing relevant, original thoughts to the question • Conveys thoughts in a well-rounded manner that show understanding, critical thought, and application of concepts	• Relevant and thought-provoking viewpoints • Innovative and indicates a high level of thought • High level of critical thought, analysis, and application of concepts and ideas
Support & References	• Does not cite any peer-reviewed sources • Addresses questions in a manner that is unclear • Not appropriate APA format	• Student cites 1 peer-reviewed source • Not in appropriate APA format	• Student cites 2 peer-reviewed sources in the body of the post • Not in appropriate APA format	• Student cites 2 peer-reviewed sources in the body of the posts • Proper APA format
Mechanics/ Length	• Post is less than 196 • Poorly written • 0 points for posts submitted after 11:59 PM EST on Thursday	• Post is 197-221 words • A few writing errors	• Post 222-250 words • Well written	• Post exceeds 250 words • Very well written

Discussion Board Rubric - Peer Response

Peer Response Rubric	Minimal	Competent	Effective	Mastery
Grade	**0-74%**	**75-82%**	**83-92%**	**93-100%**
Content	• Shows minor comprehension of concepts and viewpoints from peers • Responses are vague and do not show understanding or comprehension	• Shows adequate understanding of the knowledge and concepts posted by peers • Responses are mostly, "I agree…" • Source is somewhat relevant and published in last 5 years	• Advances discussion providing additional commentary and critique • Responses are correct but mostly restate the peers' viewpoints without development of critical thought • Source is relevant and published in last 3 years	• Advances discussion providing additional commentary that is relevant or offers an alternative • Critical thought development is evidenced by thoughtful and meaningful responses • Source is relevant and published in last 3 years
Support & References	• Does not cite any peer-reviewed sources • Not appropriate APA format	• Student cites 1 peer-reviewed source • Not in appropriate APA format	• Student cites 2 peer-reviewed sources • Not in appropriate APA format	• Student cites 2 peer-reviewed sources in the body of the posts • Proper APA format
Mechanics/ Length	• Post is less than 158 words • Poorly written • 0 points for posts submitted after 11:59 PM EST on Sunday	• Post is 158-178 words • A few writing errors	• Post 178-200 words • Well written	• Post exceeds 200 words. • Very well written

Assignment/Case Study/Course Project Rubric

Assignment Rubric	Minimal	Competent	Effective	Mastery
Grade	**0-74%**	**75-82%**	**83-92%**	**93-100%**
Critical Thinking	• Consistently below expectations • Lacks significant details of the assignment • Lacks critical thought, analysis, and application • Partially addresses the topic	• Inconsistent comprehension • Marginal responses • Content, concepts, ideas/responses are not fully developed	• Demonstrates satisfactory understanding • Lacks answer to all questions/full scenario • Demonstrates some knowledge of content and professional vocabulary • Content needs additional focus for innovative responses other than restatement of text	• Relevant use of vocabulary throughout • Demonstrates superior knowledge of concepts and theories • Addresses problem/issue directly • Demonstrates active critical thinking relevant to problem identification and effective solutions
References & Organization	• Does not cite any peer-reviewed sources • Not appropriate APA format • Does not meet page number or word count requirement as specified in instructions • Poorly written • 0 points for late assignments	• Sources are outdated or ineffective • Lacks focus on content • Unorganized • Some writing errors • Not in appropriate APA format • Does not meet page number or word count requirement as specified in instructions	• Student cites some relevant, current peer-reviewed sources • Follows directions • APA formatting demonstrated but not extensive • Meets page number or word count requirement as specified in instructions	• Professional writing structure • Well-organized response • Student cites appropriate, current peer-reviewed sources • Proper APA format • Exceeds page number or word count requirement as specified in instructions