



**UNIVERSITY OF
NORTHWESTERN**
ST. PAUL

OFFICE OF ADULT
& GRADUATE STUDIES

DAL5625

Business Stats and Analytics

Fall 2020

SYLLABUS

Version: OL v1:10/20

University of Northwestern – St. Paul
Office of Adult & Graduate Studies
3003 Snelling Avenue North
St. Paul, Minnesota 55113
ags@unwsp.edu

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Business Stats and Analytics

University of Northwestern – St. Paul

COURSE DESCRIPTION

This course is designed to equip participants to apply business statistics for the purposes of business intelligence: effectively communicating both technical information and informed recommendations to decision-makers. Emphasis will be placed on using a leading business analytical software to investigate, test, summarize, and visualize data. The course will introduce business case studies, data discovery projects, and best practices in presenting technical results. Emphasis will be placed on making interactive dashboards and effective technical presentations. (NOTE: This course requires a \$200 fee and is offered exclusively online)

Credits: 4

Prerequisites: C or better in BUA5620 Data Analysis and Decision Making

INSTRUCTOR INFORMATION

Please see “Contacting the Instructor” on the course site.

COURSE OUTCOMES

At the end of this course, a successful student will be able to

- CO-1. Critique the strategic use of statistical and visualization methods in business scenarios. (Evaluate)
- CO-2. Develop aesthetically effective dashboards and visualizations using commercial statistical software including JMP and Tableau. (Create)
- CO-3. Develop data stories and business recommendations incorporating advanced analytical elements such as applying descriptive and inferential statistics, discovering and interpreting data relationships, refining statistical models, and summarizing results. (Create)
- CO-4. Create persuasive and accessible presentations demonstrating business intelligence to address a variety of business situations. (Create)

MATERIALS

Required Textbooks and Materials

This course uses various web resources at no cost to students. Links to digital materials are provided on the course site. The following video is a primary resource used throughout the course.

Simplilearn. “Tableau Training for Beginners.” Segments linked from the course site.

Required Tools

For this course, students will need access to Microsoft Office (available at no cost to students through the University of Northwestern-St. Paul), a PDF reader, and a standard internet browser. Please refer to the

Tech Requirements found in the Technology Help section at the top of the course site for the full requirements.

Virtual Machine Access: For this course, students will gain access to the Data Mining data sets and software through the Amazon Web Service (AWS) on-demand cloud computing platform supported by the University of Northwestern IT services. Students will receive an account which allows the user to access the AWS platform environment (virtual machine / VM).

This platform contains the Data Mining data sets, analytic software tools, Firefox, Excel. The VM will be made available approximately two weeks prior to the start of class to allow students to access the platform and complete required documentation allowing use, software access and viewing of the introduction video's on using the VM environment and analytical software.

Approximately two weeks after class completion, student access to the VM platform will be deactivated, thus, any work the student wishes to retain must be downloaded prior to the VM closure. A notice from the UNW IT service department will be sent out approximately one-week prior to the cut-off date.

GRADING POLICIES AND PROCEDURES

Course Grade Explanation

Assignments	Grade Weight
Statistical Principles Quiz	2
Discussion Forums (5 x 3%)	15
Data Visualization Exercises (8 x 3%)	24
Data Story Reports (10 x 3%)	30
Individual Project	
Wk2 Individual Project Plan	3
Wk5 Individual Project	11
<u>Business Recommendation Team Presentation</u>	<u>15</u>
Total	100

Grading Scale Percentages

A	≥ 93	B	≥ 83	C	≥ 73	D	≥ 63
A-	≥ 90	B-	≥ 80	C-	≥ 70	D-	≥ 60
B+	≥ 87	C+	≥ 77	D+	≥ 67	F	< 60

Late Work

All assignments are due as described in the course syllabus. Students are responsible for meeting assignment deadlines. Late assignments will be deducted one full letter grade (e.g., A to B) per day; late assignments will not be accepted for a grade beyond 3 calendar days past the original deadline. Forum discussion activities must be completed on time; late forum posts will not receive any credit. Students should contact the instructor via e-mail if an extenuating circumstance exists.

Feedback Expectations

Students should expect feedback for their submitted assignments within 5 days of the assignment due date or the time of their submission, whichever is later.

INSTITUTIONAL POLICIES AND SERVICES

Guidelines and Information

Students are responsible for policies and procedures found in the Office of Adult & Graduate Studies Catalog located on theROCK. These policies include the following:

- Deadlines for dropping or withdrawing
- Attendance
- Class cancellations
- Plagiarism and cheating
- Grading System
- Complaints, exceptions, and appeals

Instructors may have course-related expectations that further detail the policies and procedures outlined in the catalog. Any such expectations must be provided to students in writing (e.g., handout, course site posting) prior to or at the beginning of the class.

Traditional undergraduate students enrolled in A&GS courses are subject to the traditional undergraduate student handbook for all non-course-specific policies and procedures.

Academic Integrity

Members of the Northwestern community mutually commit to personal integrity and honesty. Students submitting work are expected to convey their own thoughts unless the source is cited appropriately. Plagiarism, cheating, and other forms of academic dishonesty violate ethical and intellectual principles.

In every course, students are required to view the Understanding Plagiarism video and complete the Understanding Plagiarism Quiz prior to completing any of the course content. These items are part of the course orientation.

Academic Achievement

UNW students requesting academic accommodations in association with the Americans with Disabilities Act (ADA) are directed to notify [Disability Services](#) to begin the application process. Academic Achievement also provides the following: [Writing and Subject Tutoring](#), advocating, transitional skill building, [Academic Coaching](#) (organization, time management, test taking, etc.).

Contact Academic Achievement for more information: AcademicAchievement@unwsp.edu • 651-628-3316 • N4012 (Revised 06/20)

Support Services

Links to support services are available found in the Student Services section at the top of the course site.

COURSE POLICIES AND INFORMATION

Email and Announcements

Students are responsible to regularly check their Northwestern student email and the announcements in the course site in order to receive updates and information.

Attendance

Due to the accelerated nature of the online curricula, students are expected to participate in all course activities. Students must contact the faculty member in advance or as soon as possible if unable to participate in all or part of the course activities for a given week because of a medical (which includes having to quarantine or isolate due to COVID-19 exposure or confirmed illness), family, or work-related emergency. Students should refer to their course syllabus and/or faculty member for specific requirements. Students who do not participate in course activities and fail to withdraw from the course will receive a failing “F” grade.

Submission Standards

All assignments, unless otherwise stated, must be submitted on the course site in Microsoft Word document format (.doc or .docx). For all assignments, use a standard readable font, double-spaced, etc.

Critical Response to Alternate Viewpoints

When students are reading or viewing course materials, they may encounter viewpoints, words, or images that their instructors would not use or endorse. Students should know that materials are chosen for their value in learning to read, write, and view critically, not because the materials are necessarily Christian.

Scholarly Research

Quality participation in this course requires contribution of scholarly research to class interactions. Students can engage in external research via the Berntsen Library website by performing a search of the 60+ databases available to students. Also available on the library site are multiple tutorials to educate learners in effective search techniques. Other credible journals/articles are options as well.

ASSIGNMENTS

See the course site for complete details on the assignments.

Discussion Forums

Learning in this course relies on developing shared understanding through social learning and dialogue. Join the ongoing course conversation by initially posting to each week’s discussion forum based on the criteria outlined in the forum descriptions.

1. Posts should be concise and conversational, stating what you think, why you think that, and what more you would like to know or understand. Initial posts should be around 300 words.
 - Be intentional to support your claims in each post with at least two of the following, all three if possible: personal experience, course content, or credible external research.

Engage your classmates by replying in at least two peers’ discussion threads with questions, suggestions, examples, or counterexamples that extend or challenge their ideas and stimulate further conversation. Respond to any replies to your initial post. Replies should be around 200 words.

Initial participation in each forum is due by 11:59 p.m. CT on Day 4 and replies are due by Day 7. Earlier, more frequent participation is recommended since others depend on your contributions.

For further grading information, see the Discussion Forum Rubric on the course site.

Statistical principles Quiz

This quiz aims to help you review and recall key statistical skills that form a foundation for proficiently producing the visualizations and data stories required in this course. The quiz is meant to be a learning experience more than a measurement of your ability, so it is low stakes and allows infinite attempts with a short time limit per attempt. The goal is to help you master key concepts to the point that you can meaningfully address and apply them without extensive effort.

Data Visualization Exercises and Data Story Reports

This course includes many hands-on exercises inviting you to work with data to produce resources and data stories that are meaningful to non-technical audiences. Expect each Visualization Exercise and Report to take about 2 hours.

Most Exercises and Reports in this course support the needs of characters in the fictional organization SuperOffice. See the Course Introduction page for an overview of SuperOffice and how your efforts and skills practiced in this course could support similar real-life businesses.

Data Visualization Exercises

While other courses in the Data Analytics concentration focus on working with datasets, calculations, modeling, and running statistical analysis, this course focuses on the key step of moving from doing analysis to telling meaningful stories with data. Many business professional, decision-makers, and stakeholders want to be increasingly data-driven and leverage the possibilities of sophisticated analytics, but are themselves less proficient with technical aspects of working with data.

Visualizing and interpreting data in ways that accurately and intentionally persuade specific audiences is a key skill for your analytics repertoire. The Data Visualization Exercises throughout this course focus on first critiquing the effectiveness of visualization strategies and then producing your own effective visualizations and dashboards to meet various client needs.

See the course site for details and instructions for each individual Exercise.

For further grading information, see the Visualization Exercises Rubric on the course site.

Data Story Reports

While the Data Visualization Exercises in this course invite you to turn data into digestible charts and dashboards, the next step is to compile such data and visualizations into meaningful data stories, which usually take the form of Reports offering interpretations and recommendations.

See the course site for details and instructions for each individual Exercise.

For further grading information, see the Data Story Reports Rubric on the course site.

Individual Project

Tying to your real-world experience, the Individual Project (Due at the end of Week 5) asks you to combine the skills of visualization and telling data stories to produce a professional report for SuperOffice's Marketing Manager. For this project, create a 4-page (or longer) written report for SuperOffice that heavily relies on visuals created from Tableau.

1. **Topic Selection:** Select a topic of your interest related to SuperOffice's situation. *What is a question, need, or problem that data could more effectively address?*
2. **Use the data/dashboards you have made:** Use the Tableau data and dashboards you have already produced for SuperOffice.
3. **Report Goals:**
 - a. **Current State:** Use best practices of data storytelling to tell a compelling story of the current state of SuperOffice.
 - b. **Recommendations:** Provide an analysis plan and timeline, that will suggest additional data that SuperOffice should collect and what additional dashboards should be developed in the future.
4. **Format and Audience:** Format this report in a professional style as if you are submitting it to SuperOffice's marketing manager, in a form that could be read on a plane trip (*i.e.* this report should not look like simply an academic paper).
5. **Distribution Methods:** Also discuss how this report should be presented to various sales representatives in the South region of SuperOffice (this should be at least ½ a page)
6. **Responses to expected questions:** Anticipate the sorts of questions that the marketing manager and various sales representative would ask during such a presentation and indicate how you would explain your answers (this section should be at least 1 page)

You are strongly encouraged to work ahead. For further grading information, see the Individual Project Rubric on the course site.

Business Recommendation Team Presentation

Similar to your Individual Project, the Team Presentation asks you to synthesize various skills from this course to collaboratively produce a persuasive report that proposes how an organization of your choice (beyond SuperOffice) could solve a specific problem or reach a specific goal through more effective data analysis. For this project, you will go beyond the fictional organization of SuperOffice and find cloud or web-based data that is available for use.

While much of the implementation of your analysis plan will remain hypothetical (such as the actual production of all the visualizations, dashboards, etc. that a full analysis would require), remain as concrete as possible by demonstrating your understanding of the actual condition, possibilities, and limitations of the data you obtain, in order to realistically interpret and recommend how it could be transformed and applied.

Your team will produce a 15- to 20-minute narrated slideshow presentation. No written report is required.

1. Work in a group of 3 or 4 as assigned by the instructor
 - Analytics work in business is seldom a solo effort. The instructor will assign groups of 3-4. Teams should connect as soon as possible in order to be ready to describe their project topic by mid-Week 4, and submit a final presentation by Week 8.
2. Select one of the possible big data sets available in the Cloud.
3. Develop an analysis plan that includes the following
 - **Client Organization:** Describe the constituents and organization to whom you are presenting (Can be fictional, but should be professionally appropriate)
 - **Objectives:** What do you hope to achieve? What question or problem does your project aim to answer for the client organization?

- **Selection:** What data will you select (which parts of a set will you use and Why?)
 - **Data Discovery:** Describe, critique, and explain the condition, potential opportunities, and limitations of the data?
 - **Data Transformation:** How would you have to reorganize or transform the data into a more useful format. (You don't have to do this, just adequately describe what your project would require)
 - **Data Story:** How would you (hypothetically) use the tools of this course to make a data story
 - How would you (hypothetically) organize or coordinate visuals?
 - Provide example storyboards or mockups representing what your project aims to produce
4. Address the time investment required to actually implement this proposed project.
 - Calculate estimated total worked hours and multiply by an average cost of \$50 per worked hour to report the estimated implementation cost (not counting technology fees and other costs).
 - Discuss this cost relative to the possible benefits and other costs.
 5. Ensure each team members' contribution is clearly represented and evident
 6. Present a 15- to 20-minute narrated presentation (using Powerpoint or similar tools)
 7. Use plenty of screenshots, images, and examples in your slides to provide a compelling data story.
 8. Format and brand your presentation as if you were actually presenting to the client organization.

For further grading information, see the Team Presentation Rubric on the course site.

COURSE SCHEDULE

Format

This course is delivered in an online format that provides all learning activities online. The day the course starts is considered Day 1 of Week 1 for the course. For example, if a course begins on a Monday, then Day 1 is Monday, Day 4 is Thursday, and Day 7 is the following Sunday.

This course is an accelerated course. As a rule of thumb, students should expect to spend on average 17.5 hours on course work each week.

Due Dates

Unless otherwise noted, all assignments are to be submitted on the course site by 11:59 p.m. CT on Day 7 of each week. Please see the following schedule for details on when an assignment is due.

For any questions regarding these assignments, contact the instructor.

Orientation

- Read the Getting Started Page
- Participate in the Introductions Forum
- View and Complete Understanding Plagiarism Presentation and Quiz
- Complete Student Responsibilities Exercise

Complete Technology Orientation Tasks (Prior to Week 1 of the course)

- View IT Tutorial: Getting Started with Data Analytics Virtual Lab (AWS)
 - Register onto the AWS computer platform using the tutorials linked in Week 1
 - View the software orientation materials

Unit 1: Technical Competency

Week 1: What is Business Intelligence?

- Read the Weekly Overview
- Read and view Week 1 Resources
 - Read: “What is business intelligence? Your guide to BI and why it matters” (WO-1)
 - Read: 2019 Business Intelligence Trends (WO-1)
 - View: Tableau Training for Beginners (WO-2) (0:00:00 – 00:53:00)

Due Day 4

- Participate initially in the Wk1 Business Intelligence Forum (WO-1)

Due Day 7

- Complete participation in the weekly discussion forum
- Complete Statistical Principles Quiz (WO-2)
- Submit Descriptive Statistics Tableau Report (WO-3)

Week 2: How Do I Create Personalized Data Presentations?

- Read the Weekly Overview
- Read and view Week 2 Resources
 - View: Data Visualization Presentation (WO-1)
 - Read: Data visualization beginner's guide: a definition, examples, and learning resources (WO-1)
 - View: Tableau Training for Beginning (WO-2) (00:53:00 – 01:40:00)

Due Day 7

- Submit Visualization Exercises
 - Data Presentation Critique (WO-1)
 - Data Presentation Rubric (WO-1)
 - Sales Dashboard (WO-2)
- Submit Individual Project Plan (WO-3; graded on completion)

Week 3: How do I Read, Interpret, Summarize and Question Technical Data Reports?

- Read the Weekly Overview
- Read and view Week 3 Resources
 - Read: Business Reports (WO-1)
 - View: Tableau Training for Beginners (WO-2) (01:40:00 – 01:54:00)

Due Day 7

- Submit Visualization Exercises
 - Profit Dashboard (WO-2)
- Submit Business Report Critique (WO-1)
- Submit Linked Dashboards Report (WO-3)

Week 4: How Do I Tell a Compelling Data Story Through Visualization?

- Read the Weekly Overview
- Read and view Week 4 Resources
 - a. View: Story Telling with Data (15:52)
 - b. View: Visualizing Data for Better Policies—TED Talks (WO-1)
 - c. Read: Data Storytelling—Forbes (WO-1)
 - d. View: Tableau Training for Beginners (WO-2) (02:06:00 – 2:17:00)
 - e. View: Tableau Training for Beginners (WO-2) (02:17:00 – 03:07:00)

Due Day 4

- Participate initially in the Wk4 Data Story Forum (WO-1)
- Participate initially in the Wk4 Team and Topic Selection Forum (WO-3; graded on completion)

Due Day 7

- Complete participation in the Wk4 discussion forums
- Submit Visualization Exercises
 - Top Customers Dashboard (WO-2)
 - Joined Data Dashboard (WO-2)

Unit 2: Decision Making and Future Trends

Week 5: How do I Use Structured and Unstructured Data to Make Business Decisions?

- Read the Weekly Overview
- Read and view Week 5 Resources
 - a. Read: How to Give a Data Heavy Presentation—Harvard Business Review (WO-1)
 - b. View: Intro to JMP (WO-1)
 - c. View: “Unstructured Text Cluster Analysis” Powerpoint Presentation with Audio (WO-2)
 - d. View: “Variable Cluster Analysis” Powerpoint Presentation with Audio (WO-2)

Due Day 7

- Submit Visualization Exercises
 - Data Heavy Presentation Analysis (WO-1)
- Submit Unstructured Cluster Analysis Story in JMP (WO-2)
- Submit Variable Cluster Analysis Story in JMP (WO-2)
- Submit Individual Project (WO-1)

Week 6: How do I Create Models to Explain and Predict Data?

- Read the Weekly Overview
- Read and view Week 6 Resources
 - View: Theory of Regression Analysis Presentation (WO-1)
 - View: Theory of ANOVA Presentation (WO-2)
 - View: Principles, Components, Questions and Interpretations of Quantitative Models Presentation (WO-2)

Due Day 4

- Participate initially in the Wk6 Data Models Debate Forum (WO-3)

Due Day 7

- Complete participation in the Wk6 discussion forum
- Submit Regression Analysis JMP Report (WO-1)
- Submit ANOVA Analysis JMP Report (WO-2)

Week 7: What are Future Trends in Data Analytics?

- Read the Weekly Overview
- Read and view Week 7 Resources
 - Read: Forbes Article on Internet of Things
 - Explore: Data Analytics User Groups
 - Explore: COVID-19 Web Conference
 - View: SAS University Videos

Due Day 4

- Participate initially in the Wk7 Learning Reflection Forum (WO-2)

Due Day 7

- Complete participation in the Wk7 discussion forum
- Submit Visualization Exercises
 - Submit Getting Started with SAS Assignment (WO-3)
- Submit Future of Intelligent Use of Information Report (WO-2)

Week 8: How do I Put All This Together to Make Business Recommendations?

- Read the Weekly Overview
- Read and view Week 8 Resources
 - View: Creating Business Presentations Video (WO-1)
 - View: Event Simulation—BayesiaLab (WO-2)
 - View: Salesforce videos (WO-2)

Due Day 7

- Submit Simulation with BayesiaLab Evaluation Report (WO-2)
- Submit Salesforce Evaluation Report (WO-2)
- Submit Business Recommendation Team Presentation (WO-1)
 - You are encouraged to view other team's presentations, but replies are not required.