

MATH239

STUDENT WARNING: This course syllabus is from a previous semester archive and serves only as a preparatory reference. Please use this syllabus as a reference only until the professor opens the classroom and you have access to the updated course syllabus. Please do NOT purchase any books or start any work based on this syllabus; this syllabus may NOT be the one that your individual instructor uses for a course that has not yet started. If you need to verify course textbooks, please refer to the online course description through your student portal. This syllabus is proprietary material of APUS.

Course Summary

Course : MATH239 **Title :** Data Analysis and Presentation

Length of Course : 8

Prerequisites : MATH220 **Credit Hours :** 3

Description

Course Description: This applied course introduces students to a variety of techniques for organizing, analyzing and presenting large data sets. Topics to be covered include descriptive statistics with graphics and sample estimation. Emphasis is placed on real-world applications such as those found in the social and physical sciences. Students will become familiar with statistical software packages. (Prerequisite: MATH220)

Course Scope:

Successful completion of this course will provide students with the skills necessary to organize and describe large data sets, use statistical tools to analyze data, and present the findings using a statistical software package. The course will focus on real-world applications in the social and natural sciences.

Students will be responsible for reviewing course materials each week, as well as participating in the online discussions. The discussions serve not only as a tool for collaborative inquiry but also as an opportunity to practice the statistical concepts that are covered in the course. Students are expected to maintain regular contact with the course instructor and other students. The discussions are set up to foster such interaction.

The development of the course project is on-going during the course. Students will complete each phase of the course project, as noted in the syllabus. The final deliverables, including the presentation and write-up, will be completed in accordance with the syllabus. In addition, students will complete all unit tests as assigned.

Objectives

After successfully completing this course, you will be able to

CO-1. Identify different types of data

CO-2. Organize data sets

CO-3. Produce descriptive statistics with graphics

CO-4. Summarize data numerically

CO-5. Use sample estimation to make inferences about a population

CO-6. Apply statistical analysis to real-world problems

CO-7. Communicate and defend results using a statistical software package

Outline

Week 1: What are data?

Learning Objectives

CO-1. Identify different types of data

Readings

Section 1.1 of Locke text

Chapter 1 of Hand ebook

In Lessons: Listen to Week 1 Overview Message

Review Lesson 1 Powerpoint

Read Lesson 1 Handout

Assignment

Forum Post #1 - Introductions forum

Week 2: Data Samples and Study Designs

Learning Objectives

CO-1. Identify different types of data

Readings

Sections 1.2 and 1.3

Chapter 3 of Hand ebook

In Lessons: Listen to Week 2 Overview Message

Review Lesson 2 Powerpoints

Read Lesson 2 Handout

Assignment

Forum Post #2

Unit test #1 (1.1 - 1.3)

Week 3: Categorical Variables

Learning Objectives

CO-2. Organize data sRepresentation" by Riendeau Article "Presenting Information with the Right Data Graphic" by Borsher and Kroeger Website: <http://www.researchtoaction.org/2011/09/presenting-complex-data-visually-using-web-based-tools-to-make-your-development-data-travel/> **Articles are housed in the Course Guide under eReserve. They are also linked within the classroom Lessons under "Reading & Resources"*** In Lessons: Listen to Week 3 Overview Message Review Lesson 3 Powerpoints Read Lesson 3 Handoutets

Readings

Section 2.1

Article "Effective Data Representation" by Riendeau

Article "Presenting Information with the Right Data Graphic" by Borsher and Kroeger

Website: <http://www.researchtoaction.org/2011/09/presenting-complex-data-visually-using-web-based-tools-to-make-your-development-data-travel/>

Articles are housed in the Course Guide under eReserve. They are also linked within the classroom Lessons under "Reading & Resources"*

In Lessons: Listen to Week 3 Overview Message

Review Lesson 3 Powerpoints

Read Lesson 3 Handout

Assignment

Forum Post #3

Week 4: Shape and Center of a Distribution

Learning Objectives

CO-3. Produce descriptive statistics with graphics

CO-4. Summarize data numerically

Readings

Section 2.2

Chapter 2 of Hand ebook

Article "High Probability of Success" by Hamilton

Articles are housed in the Course Guide under eReserve. They are also linked within the classroom Lessons under "Reading & Resources"*

In Lessons: Listen to Week 4 Overview Message

Review Lesson 4 Powerpoints

Read Lesson 4 Handout

Assignment

Forum Post #4

Unit test #2 (2.1 - 2.2)

Week 5: Measures of Spread and Big Data

Learning Objectives

CO-3. Produce descriptive statistics with graphics

CO-4. Summarize data numerically

Readings

Section 2.3

Article "Managing Data" by Lindley

Article "Trustworthiness of Big Data" by Mittal

Article "Big Data: The Next Big Thing in Innovation" by Gobble

****Articles are housed in the Course Guide under eReserve. They are also linked within the classroom Lessons under "Reading & Resources"*****

In Lessons: Listen to Week 5 Overview Message

Review Lesson 5 Powerpoints

Read Lesson 5 Handout

Assignment

Forum Post #5

Week 6: Outliers, Boxplots, Scatterplots and Correlation

Learning Objectives

CO-3. Produce descriptive statistics with graphics

CO-5. Use sample estimation to make inferences about a population

Readings

Section 2.4 and 2.5

Article "Get Rapt Attention From Your Audience: Nine Strategies for Organizing Your Presentation" by Boyd

****Articles are housed in the Course Guide under eReserve. They are also linked within the classroom Lessons under "Reading & Resources"*****

In Lessons: Listen to Week 6 Overview Message

Review Lesson 6 Powerpoints

Read Lesson 6 Handout

Assignment

Forum Post #6

Unit test #3 (2.3 - 2.5)

Week 7: Linear Regression

Learning Objectives

CO-5. Use sample estimation to make inferences about a population

Readings

Section 2.6

Article "Presenting Data: Can You Follow a Recipe" by Drummond and Tom

Article "10 Golden Rules for Presenting Financial Data" by Coulter

Article "The Art and Science of Presenting Financial Data" by Kroeger

****Articles are housed in the Course Guide under eReserve. They are also linked within the classroom Lessons under "Reading & Resources"*****

In Lessons: Listen to Week 7 Overview Message

Review Lesson 7 Powerpoints

Read Lesson 7 Handout

Assignment

Forum Post #7

Week 8: Presentation of Course Project

Learning Objectives

CO-6. Apply statistical analysis to real-world problems

CO-7. Communicate and defend results using a statistical software package

Readings

No readings this week

In Lessons: Listen to Week 8 Overview Message

Assignment

Forum Post #8

Course Project Presentation due in Forums

Write-up due in Assignments Folder

Evaluation

Reading Assignments:

Please refer to the Course Outline section of this syllabus for the weekly reading assignments. While reading

assignments are not graded, it is very important that you read the assigned material and work practice problems as necessary.

Forum Assignments:

The forums are designed for students to provide information and ask questions on course content for the week. Your forum posts must meet the minimum requirement for the number of posts and the content for that assignment. These forums should not be used to discuss specific exam questions, but can be used to ask questions relative to practice exercises, practice tests, and textbook problems.

Posts should be made as indicated in the forum instructions. Be sure to click on the link "Read Full Description" so that you will be familiar with each forum requirement and the grading rubric. (A significant post generally contains at least 100 words— single sentence responses such as "Now I understand" or "Thank you for your help" do not constitute significant posts.)

Grading for each forum will follow the point structure outlined in the description for each forum. The initial post is due by Wednesday at 11:55 ET. The peer post is due by Sunday at 11:55 ET.

Introductory Forum: It is very important that you submit and participate in the Introduction Forum. Please introduce yourself to me and the class. Share where you work or plan to work after completing your program, your family, and any hobbies or special interests. Also tell us why you are taking this course and what you hope to gain from obtaining your degree. In addition, please take a look at the course objectives in the syllabus and discuss the relevance to your career goals.

Instructions for introductory forum post: Your initial post should be at least 250 words. Please respond to at least 1 other student. Responses should be a minimum of 100 words. This forum submission serves as your official entry into the course and this is why we have drawn special attention to this assignment. You will be reminded of this Forum again in the Week 1 Lesson Module, but please keep in mind that this Introduction Forum must be submitted by 11:55 p.m., ET, on Sunday of Week 1 to maintain your registration in the course.

Unit Tests:

Three numbered unit tests are found via the navigation link labeled "Tests & Quizzes." Please complete each test by the due date noted in the syllabus and in the classroom. These are open-book and open-note tests, but are not collaborative efforts. They are timed, so be sure that you have the appropriate time available before you enter each test. These are single-access tests. Once you have accessed the test, it cannot be made up.

Course Project:

The course project allows you to utilize the skills that you have learned in the course to develop and present an analysis of a large data set. You will have the option of choosing your own data or sample data with between 200 - 250 data points. You will be required to include specific analyses in your report and present the results to your colleagues. There will be a focus on using technology throughout the project. Examples of tools for presentation include a narrated PowerPoint, Prezi, linking a video through YouTube, etc. Please note the file size limitations in Sakai and plan accordingly.

Specific details of the course project:

You may choose data from any source. Choose an area that interests you. If you need ideas for finding data, do a Google search for "free data". Find a set of data that includes 200-250 data points and two categorical variables. From this data you are going to perform a series of statistical computations and present the findings to your peers by means of a technology presentation tool. The presentation will be recorded, and you will orally present your findings to the class. Your presentation will be uploaded to the forum so that your peers can review it. In addition, you will include a formal write-up of the findings that will be submitted in the class assignments folder. You will have the opportunity to be creative in how you present the findings from your data set, and we will be discussing online tools and tips/strategies for presenting data throughout the class. This course project is the culmination of the content that we cover during the course. The course project presentation accounts for 15.5% of the final course grade, and a rubric will be used to score your work (see Assignments in the classroom). This course project will mirror the practice work that you will be completing in

the forums each week, so it is a good idea to find your course project data set early on and complete the required components as we practice them each week.

In your presentation, you will be required to show the following:

- Describe the nature of the data. What do the data represent? Why did you choose this data set? How many data points are included?
- Describe the types of variables, the type of sample, possible lurking variables, and any association or causation.
- Create a histogram, describe the shape of the distribution, and find the mean and median.
- Compute the standard deviation, the five number summary, and the range and interquartile range. Provide a visual representation of this information.
- Find possible outliers (there may be none, but you will need to show how you determined that), draw a boxplot, create a scatterplot, and compute the sample correlation r .
- If you found a moderate to strong linear relation between the variables, compute the regression equation and describe how you could use a regression line to make predictions.
- Conclude with a summary of the major findings. How have these findings informed the topic, and what are the implications of the findings?

In the presentation you do not need to show each step of the computations for every statistic. You will, however, be required to show the work in the write-up. Estimated length of the presentation is 5-7 minutes.

The write-up:

In addition to presenting the findings from your data set, you will submit a formal write-up of the results. This will be submitted to the Assignments Folder in the classroom. The write-up should include detailed calculations for each statistic. It should also include all of the summary charts/tables that were presented. The write-up consists of 15.5% of the final course grade. Please find the scoring rubric in the Assignments area of the classroom.

The write-up should follow a standard narrative format, including a title page, introduction, body, conclusion, and references where appropriate. You will use APA formatting as you write. Keep in mind that in statistics we are often tasked with presenting complex analyses in a straightforward and simplified manner. We know that visual representations of data are vital to this effort. In addition, we are often required to present our findings in written form. Here you will want to explain the findings in detail, focusing on the big picture of what the findings mean and why they are important. Estimated page length for the body of the write-up is 3-5 pages. Grades for the project will be posted within 7 days of the due date.

Grading:

Name	Grade %
Forums	24.00 %
Week 1 Forum	3.00 %
Week 2 Forum	3.00 %
Week 3 Forum	3.00 %
Week 4 Forum	3.00 %
Week 5 Forum	3.00 %
Week 6 Forum	3.00 %

Week 7 Forum	3.00 %
Week 8 Forum	3.00 %
Course Project Presentation	15.50 %
Course Project Presentation	15.50 %
Unit Tests	45.00 %
Unit Test #3	15.00 %
Unit Test #2	15.00 %
Unit Test #1	15.00 %
Course Project Write-up	15.50 %
Course Project Write-up	15.50 %
Assignments	0.00 %
APUS Honor Code and Pledge	0.00 %

Materials

Book Title: Statistics: Unlocking the Power of Data (custom) - The VitalSource e-book is provided via the APUS Bookstore; hard copy not available from the APUS Bookstore, please try other sources.

Author: Lock

Publication Info: Wiley

ISBN: 9781119919384

Book Title: You must validate your cart to get access to your VitalSource e-book(s). If needed, instructions are available here - <http://apus.libguides.com/bookstore/undergraduate>

Author: N/A

Publication Info: N/A

ISBN: N/A

Students will need a calculator (either a physical calculator or an online calculator) to successfully complete this course. The calculator should be capable of performing statistical functions, or a computer spreadsheet program like Microsoft Excel may be used. Students may make use of the above for all graded assignments and exams during the course.

Additional Resources

Additional readings will be required during the class. All of these readings are available in electronic form and can be found in the eReserves in the classroom.

Student companion site for textbook:

<http://bcs.wiley.com/he-bcs/Books?action=index&itemId=0470601876&bcsId=8088>

StatKey software:

<http://lock5stat.com/statkey/>

Web Sites

In addition to the required course texts, the following public domain web sites are useful. Please abide by the university's academic honesty policy when using Internet sources as well. Note web site addresses are subject to change.

Site Name	Web Site URL/Address
Khan Academy	https://www.khanacademy.org/
YouTube	http://www.youtube.com/
Free Online Calculators	http://www.calculator.com/
APUS Statistics Video Tutorials	http://www.apus.edu/media/mathWV/statistics.htm

Course Guidelines

Citation and Reference Style

- Attention Please: Students will follow the APA Format as the sole citation and reference style used in written work submitted as part of coursework to the University. Assignments completed in a narrative essay or composition format must follow the citation style cited in the APA Format.

Tutoring

- [Tutor.com](https://www.tutor.com) offers online homework help and learning resources by connecting students to certified tutors for one-on-one help. AMU and APU students are eligible for 10 free hours* of tutoring provided by APUS. Tutors are available 24/7 unless otherwise noted. Tutor.com also has a SkillCenter Resource Library offering educational resources, worksheets, videos, websites and career help. Accessing these resources does not count against tutoring hours and is also available 24/7. Please visit the APUS Library and search for 'Tutor' to create an account.

Late Assignments

- Students are expected to submit classroom assignments by the posted due date and to complete the course according to the published class schedule. The due date for each assignment is listed under each Assignment.
- Generally speaking, late work may result in a deduction up to 15% of the grade for each day late, not to exceed 5 days.
- As a working adult I know your time is limited and often out of your control. Faculty may be more flexible if they know ahead of time of any potential late assignments.

Turn It In

- Faculty may require assignments be submitted to Turnitin.com. Turnitin.com will analyze a paper and report instances of potential plagiarism for the student to edit before submitting it for a grade. In some cases professors may require students to use Turnitin.com. This is automatically processed through the Assignments area of the course.

Academic Dishonesty

- Academic Dishonesty incorporates more than plagiarism, which is using the work of others without citation. Academic dishonesty includes any use of content purchased or retrieved from web services such as CourseHero.com. Additionally, allowing your work to be placed on such web services is academic dishonesty, as it is enabling the dishonesty of others. The copy and pasting of content from any web page, without citation as a direct quote, is academic dishonesty. When in doubt, do not copy/paste, and always cite.

Submission Guidelines

- Some assignments may have very specific requirements for formatting (such as font, margins, etc) and submission file type (such as .docx, .pdf, etc) See the assignment instructions for details. In general, standard file types such as those associated with Microsoft Office are preferred, unless otherwise

specified.

Disclaimer Statement

- Course content may vary from the outline to meet the needs of this particular group.

Communicating on the Forum

- Forums are the heart of the interaction in this course. The more engaged and lively the exchanges, the more interesting and fun the course will be. Only substantive comments will receive credit. Although there is a final posting time after which the instructor will grade comments, it is not sufficient to wait until the last day to contribute your comments/questions on the forum. The purpose of the forums is to actively participate in an on-going discussion about the assigned content.
- “Substantive” means comments that contribute something new and hopefully important to the discussion. Thus a message that simply says “I agree” is not substantive. A substantive comment contributes a new idea or perspective, a good follow-up question to a point made, offers a response to a question, provides an example or illustration of a key point, points out an inconsistency in an argument, etc.
- As a class, if we run into conflicting view points, we must respect each individual's own opinion. Hateful and hurtful comments towards other individuals, students, groups, peoples, and/or societies will not be tolerated.

University Policies

[Student Handbook](#)

- [Drop/Withdrawal policy](#)
- [Extension Requests](#)
- [Academic Probation](#)
- [Appeals](#)
- [Disability Accommodations](#)

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