MATH120

Course Summary

Description

Course Description: This is an introductory statistics course designed to help students achieve a basic understanding of the statistical methods available to analyze and solve the wide variety of problems encountered in workplace environments. The course is designed for students who seek an understanding of how statistics can be applied in areas that require the use of descriptive and inferential statistical methods. The emphasis of the course will be on the proper use and interpretation of statistical techniques. This is a MATH General Education course without any required prerequisites.

Course Scope:

Successful completion of this course will provide students with a working knowledge of the basic principles of statistics and enable them to solve problems. This course provides students with lectures, discussion and practice in using the concepts of descriptive and inferential statistics. The course emphasizes calculation, practical application and interpretation. It begins with sample and population parameters, proceeds to measures of central tendency, dispersion, and position, introduces linear regression, several key probability distributions, and concludes with the simple hypothesis tests. This course will use Microsoft Excel and an online- Statistics Lab.

Objectives

After completing the course, the student should be able to:

CO-1. Explain the use and misuse of statistical concepts.

CO-2. Compute measures of central tendency and measures of dispersion to summarize data collected from real world scenarios.

CO-3. Solve basic probability problems.

CO-4. Apply probability distributions to real world problems.

CO-5. Employ inferential statistics to analyze sample statistics and relate them to the population.

CO-6. Explain the relationship between variables with simple linear regression techniques.

Outline

Week 1: Data Classification, Descriptive Statistics

Learning Objectives

CO1 and CO2

LO1.1 – Define Statistics

LO1.2 – Distinguish between population parameters and sample statistics

LO1.3 – Explain the difference between descriptive statistics and inferential statistics

LO1.4 – Classify data by type and level of measurement

LO1.5 – Apply sampling techniques based on experimental design

LO1.6 – Construct tables, graphs, and charts of qualitative and quantitative data

Reading And Study

Textbook Sections: Chapters 1 and 2.1-2.2

MS Excel Tutorials

Assignments

Week 1 Forum: Introductions

MyStatLab Homework 1 Complete Honor Pledge

Week 2: Descriptive Statistics, Linear Regression and Correlation

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Learning Objectives

CO1, CO2, and CO6

LO2.1 – Find measures of central tendency, measures of variation, and measures of position of quantitative data

LO2.2 – Define linear regression

LO2.3 – Interpret the correlation coefficient and the coefficient of determination in a linear regression model

LO2.4 – Find the equation of a regression line

LO2.5 – Use the linear regression model to predict the dependent variable

Reading And Study

Textbook Section: 2.3-2.5 and 9.1-9.3

Assignments

Week 2 Forum

MyStatLab Homework 2

MyStatLab Quiz 1

Week 3: Probability

Learning Objectives

CO1 and CO3

LO3.1 – Apply the basic concepts of probability to real world scenarios

LO3.2 – Find the probability of events using conditional probability and the multiplication rule

LO3.3 – Find probabilities using the addition rule for mutually exclusive and non- mutually exclusive events

LO3.4 – Use permutations and combinations to find probabilities

Reading And Study

Textbook Section: Chapter 3

Assignments

Week 3 Forum

MyStatLab Homework 3

Week 4: Discrete Probability Distributions

Learning Objectives

CO1 and CO4

LO4.1 – Discuss random variables from both a discrete and a continuous perspective

LO4.2 – Construct a discrete probability distribution

LO4.3 – Find the mean, variance, standard deviation, and expected value of a discrete probability distribution

LO4.4 – Solve for probabilities, mean**,** variance, and standard deviation of a binomial distribution

Reading And Study

Textbook Sections: 4.1-4.2

Assignments

Week 4 Forum

MyStatLab Homework 4

MyStatLab Quiz 2

Week 5: Normal Probability Distribution, The Central Limit Theorem

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Learning Objectives

CO1 and CO5

LO5.1 – Explain the normal distribution

LO5.2 – Find areas under the standard norm curve

LO5.3 – Find probabilities of a normal distribution using a table and technology

LO5.4 – Apply techniques to find z-scores, x-values and specific data values of a normal probability distribution

LO5.5 – Explain sampling distributions

LO5.6 – Apply the Central Limit Theorem to find the probability of a sample mean

Reading And Study

Textbook Sections: 5.1-5.4

Assignments

Week 5 Forum: Midterm Critique

MyStatLab Homework 5

Week 6: Confidence Intervals

Learning Objectives

CO1 and CO5

LO6.1 – Explain point estimates and margin of error

LO6.2 – Construct Confidence Intervals for a population mean (sigma known or unknown) and population proportion

LO6.3 – Determine the minimum sample size required when estimating the sample mean or proportion

Reading And Study

Textbook Section: 6.1-6.3

Assignments

Week 6 Forum

MyStatLab Homework 6

MyStatLab Quiz 3

Week 7: Hypothesis Testing with One Sample

Learning Objectives

CO1 and CO5

LO7.1 – Explain the concepts of a statistical hypothesis

LO7.2 – Apply the concepts of hypothesis testing for the mean (sigma known or unknown) and proportion

with one sample

Reading And Study

Textbook Section: 7.1-7.3

Assignments

Week 7 Forum

MyStatLab Homework 7

Week 8: Course Review Final Examination

Learning Objectives

CO1, CO2, CO3, CO4, CO5, and CO6

LO8.1 – Demonstrate understanding of statistical concepts presented in this course

LO8.2 – Express attributes of course concepts as applied to future engagements and activities

Reading And Study

Textbook Sections

Chapter 1

Chapter 2

Chapter 3

Chapter 4

Sections: 4.1-4.2

Chapter 5

Sections: 5.1-5.4

Chapter 6

Sections: 6.1-6.3

Chapter 7

Sections: 7.1-7.3

Chapter 9

Sections: 9.1-9.3

Assignments

Week 8 Forum: Final Debriefing

“Review for Final Exam” Final Exam

Evaluation

Honor Pledge: The honor pledge is an intricate part of the APUS Culture. This assignment is worth 1% of the final grade for this course**.** For this assignment, students are required to acknowledge the honor pledge below:

> *As a member of the American Public University System learning community, I will respect and abide by the APUS Honor Code. I understand and will abide by the University's policy of academic integrity, as described in the Student Handbook and the University Catalog. I accept responsibility for my actions, and I will not condone or assist other students in dishonesty or plagiarism. Finally, I will accept the consequences of any violations on the University's academic policies.*

Forum Assignments: The University requires weekly contact from each student. This requirement can be met by participating in the weekly Forums. A total of 16% of the final grade will be based on participation in the weekly Forums. Forum postings are expected to be written in complete sentences using correct grammar and spelling. Any posting which requires research must be accompanied by a citation of the references used. Forums are due Thursday of each week. Comments to fellow students must be completed by Sunday of each week.

Homework: Homework problems are assigned for each section of the book that we study. The Homework can be found in the Lab by clicking on the left MyStatLab Tab in the Classroom. Inside the homework you will find tools that you can use to help you to be successful, these tools include:

- **Help Me Solve This:** walks you step-by-step through the assigned problem**.** Once it has guided you to the solution, you must choose similar exercise in order to get a new problem to do for credit.
- **Show Me An Example:** demonstrates a similar problem for you. This feature is especially handy if you want to know the format it wants for an answer. If the example has the answer in decimal form, then that's what you should use for your problem.
- **Video:** shows a video tutorial of the concept associated with the problem.
- **Text:** takes students to the Section in the text book where the concept is covered.

These homework problems count as 35% of your final grade and they are an important factor in your success at mastering the subject. Statistics is not a spectator sport - one learns statistics by using critical thinking and by putting the pencil to the paper!

> **Quizzes:** There will be three graded quizzes during the course. Each will be a 25 question online, open-book, open-note exam. You may not consult with any other person while taking the exam. A total of 27% of the final course grade comes from these quizzes. These assignments will follow the same format as the homework. The questions are selected to provide the student with hands on experience in applying the techniques and processes discussed.
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> **Final Exam**: The final exam will count as 22% of the final grade. It will also be a 25 question online, open-book, open-note exam. You may not consult with any other person while taking the exam. This examination will be based on all material covered during the semester. The questions will require computations and application of the material covered during the semester.

Please coordinate with the professor for any special arrangements. Unless the professor approves alternate arrangements, students should plan to take the final examination during the last week of the course. You will **not** need a proctor to take this exam.

Grading:

Name	Grade %
Forums	16.00 %
Introductory Forum	2.00 %

Week 2 Forum	2.00 %
Week 3 Forum	2.00 %
Week 4 Forum	2.00 %
Week 5 Forum	2.00 %
Week 6 Forum	2.00 %
Week 7 Forum	2.00 %
Week 8 Forum	2.00 %
Homework	35.00 %
Homework average	35.00 %
Assignments	27.00 %
Quiz 1 Week 2 Critique	9.00 %
Quiz 2 Week 4 Critique	9.00 %
Quiz 3 Week 6 Critique	9.00 %
Final Exam	22.00 %
Final Exam Critique	22.00 %
APUS Honor Code and Pledge	1.00 %
APUS Honor Code and Pledge	1.00 %

Materials

Book Title: Elementary Statistics: Picturing the World, 6th ed. - the VitalSource e-book is provided via the APUS Bookstore

Author: Larson & Farber

Publication Info: Pearson

ISBN: 9780321901118

Book Title: MATH120 Pearson MyLab access provided inside the classroom

Author:

Publication Info: Pearson

ISBN: N/A

Required Course Textbooks

Author	Book Title	Publication Info	ISBN
Larson, R. and Farber, B.	Elementary Statistics: Picturing the World (6th ed.)	Pearson	ISBN-10: 0321911210 ISBN-13: 9780321911216

Elementary Statistics: Picturing the World (6th ed.) - The Vital Source e-book is provided via the APUS

Bookstore. Included with the e-Book is a subscription to MyStatLab - an online resource provided by the publisher with video lectures and guided Practice Problems to aid in understanding the material more easily. Homework, unit tests, and supplementary information are available through MyStatLab. The advantage of using MyStatLab is the variety of help buttons that can be used for guidance in solving each problem.

Students will need access to Microsoft Excel to successfully complete this course. Instructions will be provided to student on the use of Microsoft Excel. Microsoft Excel is used because it is a common software that is found in the typical work environment and on most computers. Students may make use of the Microsoft Excel for all graded assignments during the course.

Supplementary Materials

The lessons contain links to online supplementary materials for this class. You may click on the links in the lessons directly to view them. In addition to these, 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. Additionally, the APUS Library has Statistics Tutorials.

Site Name	Web Site URL/Address
Khan Academy	http://www.khanacademy.org/
PatrickJMT	http://patrickjmt.com/
Purplemath	http://www.purplemath.com/modules/

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 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

The mission of American Public University System is to provide high quality higher education with emphasis on educating the nation's military and public service communities by offering respected, relevant, accessible, affordable, and student-focused online programs that prepare students for service and leadership in a diverse, global society.