Catalog Description and Objectives

The learning outcome of this course is to demonstrate understanding of quantitative analysis which enables students to use and analyze quantitative data intelligently.

The purpose of the course is to provide students with statistical thinking and data analysis techniques for decision-making purposes. These techniques are developed by explaining the statistical concepts and tools, giving examples, and discussing detailed computer output.

Throughout the course, students learn about all the steps and procedures required to solve problems in science, social science, and business where data are useful – from definition of the managerial problem to the use of statistical analysis to address the problem. The course utilizes output from computer software (MS Excel, student version of MINITAB, or the software coming with the text) to analyze data.

Through the homework assignments involving large size data, students learn to use computer software for statistical analysis.

This course satisfies Loyola University’s core Knowledge Area requirement in “Quantitative Analysis”, Skills Area requirement of “Quantitative and Qualitative Analysis and Research Methods” and the “Critical Thinking Skills and Dispositions”.
Course Overview and Objectives

To give you a working knowledge of how to analyze and draw conclusions from statistical data.

We will not spend time proving theorems or deriving Formulas in this course. However, a “Working Knowledge” does not imply that all you have to know is how to plug numbers into formulas. You must also be able to interpret and draw conclusions from your results.

As a manager, you yourself may not have to perform statistical analysis, but you will certainly be required to read reports and literature which include statistical analysis.

To introduce you to a number of statistical techniques which are fairly widely used in industry, science, education and government.

To help prepare you for several advanced courses in the Business School, such as Operations Management, Cost Accounting, Marketing Research and Data Analysis.

To improve your ability to criticize statistical interpretations and conclusions in newspapers, magazines, and books. To recognize the misuses of statistics, and how to judge the claims of advertisers, politicians, journalists, economists, lawyers, social scientists, religion leaders, pressure groups, medical researchers, advocates of “politically correct” views, etc.

To enable you to be more critical consumers of information.
Course Objectives and Learning Outcomes

The primary goal of the course is to help students understand how the methods of statistics can be applied successfully to decision-making processes under uncertainty. This is accomplished by introducing students to the subjects of data collection, data summary, basic probability concepts, normal distribution, sampling and drawing conclusions about large populations based on information obtained from samples. The techniques of estimation, hypothesis testing and regression are used for making inferences.

Students completing this course should be able to:

- Generate, modify and interpret qualitative and quantitative data graphically and numerically.
- Develop and understand statistical models used to make decisions under uncertainty.
- Understand how quantitative and qualitative analysis is used to help businesses make ethical and better decisions in the face of uncertainty.

Skills objectives:

Students completing ISOM 241 should be able to:

Quantitative and Qualitative Analysis

- Represent and interpret quantitative information symbolically, graphically, numerically, verbally, and in writing form.
- Recognize the limitations of mathematical and statistical models.
- Develop an understanding of the rudiments of statistics, including sampling and hypothesis testing, and the uses of statistical reasoning in everyday life.

Critical Thinking Skills and Dispositions

- Analyze relationships among statements, questions, concepts, descriptions, or other forms of representation intended to express beliefs, judgments, experience, reasons, information, or opinions.
- Generate new ideas, hypotheses, opinions, theories, questions, and proposals; and develop strategies for seeking and synthesizing information to support an argument, make a decision, or resolve a problem.

Values:

- Discuss in lectures the importance of using statistics in an ethical and appropriate manner.
Required Materials

*Basic Statistics for Business & Economics*, (8th edition), by Lind, Marchal and Wathen. ISBN: 978-0-07-744674-4 Text is available at Campus Bookstore on Pearson. We will cover most of Chapters 1-3, 5-10, and about half of Chapter 13, and the first few pages of Chapter 14. In addition, I will be passing out quite a few handouts throughout the course, and we will analyze computer output.

Homework:

Homework will be regularly assigned, but never collected. I will go over most of the homework in class. Doing the homework will provide feedback on your understanding of the material and is an excellent preparation for the exams.

Course Requirements and Grading Criteria

There will be three, full-period exams, plus a two-hour Final exam. All exams are open book, open notes. Calculators are allowed. Final exam is not cumulative.

**First Exam:** Friday, September 19

**Second Exam:** Friday, October 10

**Third Exam:** Friday, October 31

**Final Exam** Monday, December 15, at 1:00 to 3:00PM

The first three exams will consist entirely of multiple choice questions. The Final Exam will be a mix of multiple-choice questions and computational problems. Some of the multiple-choice questions will be based on something I said in class.

The multiple-choice questions will be graded by Scantron. So bring a couple of No. 2 pencils to each exam.

An unexcused absence from an exam merits a zero. If you are physically incapacitated, contact me by the date of the exam. In the case of an excused absence, you must take the exam before I pass the graded exams back to class. Otherwise, the grade for the missed exam is zero.

A make-up exam will be given only under extraordinary circumstances.
<table>
<thead>
<tr>
<th>Course Grading Scale</th>
<th>Grading allocation:</th>
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<tbody>
<tr>
<td>93 - 100</td>
<td>A</td>
</tr>
<tr>
<td>92</td>
<td>A-</td>
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<tr>
<td>89 - 91</td>
<td>B+</td>
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<td>82 - 88</td>
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<td>81</td>
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<td>69</td>
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<td>67 - 68</td>
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<td>60 - 66</td>
<td>D</td>
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<tr>
<td>Under 60</td>
<td>F</td>
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**First 3 exams:** 60%

**Final Exam:** 40%

**Note:** If your course average is on the border between two grades, class participation can pull you up to the higher grade.

No extra credit options are available.

**Quinlan School of Business Policies:**

**Attendance**

Class attendance and participation are fundamental components of learning, so punctual attendance at all classes, for the full class meeting period, is expected of Quinlan students. Faculty may set participation policies unique to their courses and use class participation as a component of the final grade. The student is responsible for any assignments or requirements missed during an absence.

You are strongly urged to attend every class, but attendance will not be taken. Note that the students who perform poorly in my courses are usually those who miss many classes.
**Make-Up Examinations**

Loyola University academic policy provides that tests or examinations may be given during the semester or summer sessions as often as deemed advisable by the instructor. Because Quinlan faculty believe examinations represent a critical component of student learning, required examinations should be taken during the regularly scheduled class period. **Make-up examinations are discouraged.** Exceptions may be granted only by the faculty member or department chair, and only for unavoidable circumstances (illness verified by a signed physician’s note, participation in intercollegiate athletic events, subpoenas, jury duty, military service, bereavement, or religious observance). A make-up final examination may be scheduled only with the permission of the appropriate Quinlan Assistant or Associate Dean.

If a make-up examination must be given, it is the responsibility of the faculty member to prepare, schedule, and proctor the exam. The only regular exception is for a student athlete, who may use the testing services of the Athletics Department to complete a make-up examination. For a student with a documented special testing need, please consult University policy concerning use of the testing center in Sullivan Center at Lake Shore Campus.

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**Academic Integrity**

All members of the Quinlan School shall refrain from academic dishonesty and misconduct in all forms, including plagiarism, cheating, misrepresentation, fabrication, and falsehood…Plagiarism or cheating on the part of the student in individual or group academic work or in examination behavior will result minimally in the instructor assigning the grade of “F” for the assignment or examination. In addition, all instances of academic dishonesty must be reported to the chairperson of the department involved.

For further information about expectations for academic integrity and sanctions for violations, consult the complete Quinlan School of Business Honor Code and Statement of Academic Integrity on the Quinlan website:  
<table>
<thead>
<tr>
<th>Class Week &amp; Date</th>
<th>Topic &amp; Assignment/Readings</th>
</tr>
</thead>
</table>
| August 25         | Chapter 1: Introduction to Statistics  
|                   | Chapter 2: Frequency Distributions and Graphs 
|                   | *(Skip “Cumulative Frequency Distributions”)* |
| September 3       | Finish Chapter 2  
|                   | Chapter 3: Descriptive, Numerical Measures 
|                   | *(Skip “Mean Deviation”, “Chebyshev’s Theorem”, and “Empirical Rule”)* |
| September 8       | Finish Chapter 3  
|                   | Chapter 5: Probability Concepts 
|                   | *(Skip Formula [5-6], “Tree Diagrams”, and “Principles of Counting”)* |
| September 15      | Continue Chapter 5 |
| September 19      | **FIRST EXAM: SEPTEMBER 19** |
| September 22      | Continue Chapter 5 |
| September 29      | Finish Chapter 5  
|                   | Chapter 6: Discrete Probability Distributions 
|                   | *(Skip Formula [6-2], and “Poisson Probability Distribution”)* |
| October 8         | Finish Chapter 6  
|                   | Chapter 7: Continuous Probability Distributions 
|                   | *(Skip “Uniform Distributions”)* |
| October 10        | **SECOND EXAM: OCTOBER 10** |
| October 13        | Finish Chapter 7  
|                   | Chapter 8: Sampling Methods and the CLT |
| October 20        | Finish Chapter 8  
|                   | Chapter 9: Estimation and Confidence Intervals 
|                   | *(Skip Section 9.5)* |
| October 27        | Continue Chapter 9 |
| October 31        | **THIRD EXAM: OCTOBER 31** |
November 3  Finish Chapter 9:
Chapter 10: One-Sample Tests of a Hypothesis
(Skip Section 10.8)

November 10  Continue Chapter 10

November 17  Finish Chapter 10

November 24  Chapter 13: Linear Regression and Correlation
(Skip Section 13.4, Section 13.6, “The Standard Error of Estimate”, and from middle of page 417 to page 427)

December 1  Finish Chapter 13
Chapter 14: Multiple Regression
(Cover only pages 444-451)

December 15  **FINAL EXAM, at 1:00-3:00P.M.**
(Monday)

**Note:** You must take the Final Exam on the scheduled day and time.

**Topics Covered:**

Data Collection, Presentation and Description
Probability Theory
Probability Distributions
The Binomial Probability Distribution
The Normal Probability Distribution
Sampling Methods
Sampling Distributions
Statistical Estimation
Hypothesis Testing
Simple Regression and Correlation
Multiple Regression

**Note:** You should read every “Statistics in Action” application included in each Chapter we cover.

**Please note:** This class may occasionally deviate from the course outline above. The instructor reserves the right to make changes as needed to the course syllabus.