

Res Econ 212: Intro to Statistics for Social Sciences

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Course Description

This is the first course in a two-course sequence for Resource Economics majors, the first one being the General Education R2 course and the prerequisite to the second course. This course also satisfies the statistics requirements for many majors in Isenberg, Social and Behavioral Science, and Natural Sciences (always check your major requirements).

When students complete this course we want them to have a working understanding of the methods and skills used to organize data, conduct meaningful analysis and draw inferences from the data. As well as being an academic course, knowledge of statistics allows you to experience the world in a different light. The skills you will learn can be used in your everyday decision-making, communication, and interpretations of current news.

The structure of this course by which you will learn the above concepts fulfills the Social and Behavioral Science designation of the General Education (Gen Ed) Program. In particular, you will be working on a semester project that addresses an empirical question of your design. This project development is aimed to improve your ability to think critically and analytically, obtain and process information using theoretical concepts and empirical methods, and demonstrate clear and effective writing skills.

I want to show you through this course that, as well as being extremely useful in an age where numbers are increasingly used, and abused, STATS IS POWER. After taking this course you will be able to test your ideas (hypotheses) with a limited amount of information (data) and to judge the usefulness of survey results commonly found in the media. Teaching you key ingredients for the responsible consumption and production of statistical information is my ultimate goal.

Course Objective

At the end of this course students will be able to:

- Be able to conduct meaningful analysis and draw inferences from the data
- Be able to recognize scenarios where statistical analysis may be helpful.
- Apply statistical analysis to real word situations.

Number of Credits

This course consists of 4 credits.

Course Communications

Effective communication is important for successful learning, especially for on-line course. I strongly encourage you to ask, discuss, communicate with me for any issues of this courses. QUICKMAIL via Moodle can be used to send an email to the instructor. Responses will be sent to your OIT email/email registered in Moodle. Otherwise, emailing me directly works equally well. I will make a strong attempt to look at email every day except Saturday. We can also arrange for chat times etc as needed for office hours.

We will have weekly chats where you may ask me any question regarding the material covered in that week. I have also set up a welcome chat for Tuesday January 21st to answer any question you may have regarding the general guidelines of the course.

Prerequisites

Knowledge of high school algebra. You must have access to a personal computer and great access to the Internet. Most importantly, you must have a willingness to work hard and abandon any preconceptions that math is hard or not fun!

Required Materials

Textbook

The required textbook is Discovering Business Statistics, by Quinton Nottingham and James Hawkes. For this course, you should have an access on Hawkes Learning. To get this access, the software of the textbook is required. You can purchase this software from the following link:

<http://www.hawkeslearning.com/Support/GetYourAccessCode/>

If you want to have a physical book, you can purchase one from the following website:

<http://hawkespublishing.stores.yahoo.net/>

This textbook and its software will be used for the next level course, RESECON 213. If you plan to take RESEC 213, keep the textbook for the future use.

Personal Computer

This course requires to have a personal computer with reliable access on the Internet. Most assignment or reading will be on Moodle or Hawkes Learning so the reliable computer is necessary. Some assignments requires to use a statistical packages. All communication will be through Moodle or Hawkes Learning.

For this course, Microsoft Excel will be used. Thus, you should have MS Excel installed in your computer. If MS Excel is not installed, you can download for free. Check the following website of UMass OIT:

<https://www.umass.edu/it/software/microsoft-office-365-education>

Moodle

We will be using Moodle for this course. All the activities of this class will be posted in Moodle one week in advance so you can plan your time appropriately. All important information regarding due dates and exam dates are in this document, but it will also be published in Moodle. You can also see your grades on Moodle and in Hawkes Learning

To access Moodle please follow this instructions:

- Go to moodle.umass.edu
- Click "Log in with NetID"
- Enter your NetID
- Under "My Courses" click on: "RES-ECON 212 Intro to Statistics."

Piazza

Piazza is a Q&A website. We will use Piazza for academic matters only. In Piazza, questions can be answered by other students or by the instructor, so I strongly encourage you to ask questions and answer some of them if you can.

Here we will be able to ask questions regarding due dates, any difficulty you may have with homework, things that were not clear from class, etc. Piazza has the option of posting anonymously so you can ask anything without feeling self-concern about the relevance of the question. When asking or answering questions, please be respectful and use appropriate language

Answering questions in Piazza will contribute to your participation grade (more on this later)

Course Structure

Class Structure

Even though this course is on-line, I will assume that we have one class per week on Tuesdays, so the deadlines for reading and assignment will schedule accordingly. Each week you will need to complete two to four lessons. Each lesson consists of three parts: Learn, Practice and Certify (more on this later). Every two weeks we will have a Web Test regarding the content of the lessons for those weeks. Finally, there will a Midterm exam and a Final exam.

Lessons

For each week, reading and assignment will be assigned on Hawkes Learning as a form of Lesson. Lesson consists of three sections:

Learn: It provides the reading of the assigned chapter from the textbook. You should read this carefully before moving to Practice.

Practice: This provides opportunities to review what you have learning from Learn. This section is not graded as long as you complete all questions.

Certify: This part of the lesson will be graded. Two attempts will be given. In order to complete this section, you should have 8 of 10 points (80%, or above of Mastery Level). Certify is quite similar to Practice so before starting Certify, you should complete Practice.

In Lesson, there are bonus point opportunities. At the end of each chapter, there will be a review lesson. If you need extra points, please complete the review lesson.

Web Test

Every two weeks, there will be a short quiz called Web Test. Each Web Test will have 10 to 15 questions, similar to the questions in Certify. Two attempts will be given and the best score will be recorded into your grade.

Project

This assignment consist in a real world application of the topics learned in class. You will be working in your project starting on week 1. There will be two submissions of the project: a First Draft due before spring break (March 13th) and a Final Draft Due on the last week of class (April 29th). You will find the project guidelines and the data set that you must use in Moodle.

Midterm and Final

There will be one midterm (March 12th) and one final(May 6th) for this course. Each exam has two parts: part one is the questions of multiple choice an short answer questions. This will be conducted in Web Test of Hawkes Learning. Part two is a written questions/problems and conducted through Moodle. The questions of part two will be posted and submitted on Moodle. You will be given 24 hours once both part one and part two are posted.

Grading Policy

Weight	Assignment
35%	Lessons
15%	Web Test
15%	Project
15%	Midterm
20%	Final
10%	Bonus Points

Table 1: Grading components

The grading scale (subject to change in favor of students) used in this course is:

Letter grade	A	A-	B+	B	B-	C+	C	C-	D	F
Score	90-100	85-89	80-84	75-79	70-74	65-69	60-64	55-59	50-54	0-49
Points	4	3.7	3.3	3	2.7	2.3	2	1.7	1	0

Table 2: Grading scale

Course policies

- Every assignment and exam in Hawkes Learning and Moodle has the specific due date. If you miss the due data, there will be a late penalty: 10 % off from your total points and additional 10% off per day. Please submit your work accordingly.

- The project should be turned in on time. A tolerance of two days will be given for late submissions with a penalty of 20%. After the two days, no submission will be accepted.
- No Late exams. If you know that you will not be able to take the exam for any reason, you can take the exam earlier but not after the established date. In the case that you miss the midterm, you can make it up with the final (80% of the grade you get in the final exam will be allocated as the grade for the missed midterm).

Participation

- Participation is not mandatory, but you will be rewarded (bonus points). You can earn these points by answering or posting questions on Piazza, by dropping by on office hours to discuss some of the topics we cover in class, or by participating in the chat sessions for each week.

Office hours

- You should always feel free to drop by office hours or set up an appointment. I am here to provide you all with an additional resource to assure your success in this course.

Civility inside the classroom

- Avoid negative language that is considered derogatory in any way or may exclude members of our campus and classroom community. Please inform me immediately if there is ever any language used or actions taken by me or other students in the context of this course that you find offensive. We must all work together to create an environment that includes everyone.
- Respectful environment. In this class, you can express your opinion with complete safety. I encourage all of you to listen and analyze all points of view. If you do not agree with something that anybody in the class (including me) have said, you can reply with respect and in an ordered manner.
- You are welcome to use your laptop or tablet, but I advise you to not do so. If you decide to bring your computer or tablet, please seat in the left side of the class. I will reserve two/three lines of chairs for students who want to use these tools.

Emails

- If I need to contact you personally or through Moodle, I will use your UMass email address. Please make sure you check this mailbox regularly throughout the semester.
- If you have a question regarding the course please check the Syllabus first, Moodle second and Hawes Learning third. If you do not find an answer in this places, please post a question in Piazza, either me or any of your classmates will answer your question there. Try not to send me emails with questions that may be on everybody interest.
- If you decide to send me an email, I will respond to your questions within 24 hours. If your questions are about course material, I will respond copying your post and my response to the entire class (unless you ask me not to).
- I am more than happy to receive emails with constructive comments and suggestions regarding the class and assignments; however, please be respectful and use appropriate language in any emails to myself and other members of the class.

Accommodation policy

- UMass is committed to providing an equal educational opportunity for all students. If you have a physical, psychological, or learning disability on file with the Office of Disability Services (DS), you may be eligible for accommodations to help you succeed. If you have a documented disability that requires an accommodation, notify me ASAP. We will work together to make arrangements. If you have physical/mental impediments to your ability to complete coursework, or think you might have a disability, I encourage you to consult DS at <http://www.umass.edu//disability> or 160 Whitmore Admin. Building. The Center for Counseling and Psychological Health (CCPH) helps students who experience a variety of issues and provides individual and group counseling. Visit umass.edu/counseling to learn about their services (related to stress, eating disorders, suicidal thoughts, relationships, and much more).

Academic honesty

- The University's policies on Academic Honesty apply to all work in this course. For examples of cheating and further information on the University's Academic Honesty policy, please see <http://www.umass.edu/honesty>.

Tentative course outline

Date	Readings	Topic
January		
Week 1	Chapters 1, 2	1.1 - 1.3 Getting Started and 2.1 - 2.4 The Reality of Conducting a Study
February		
Week 2	Chapters 2, 3	Levels of Measurement and Data Classifications, Graphical Displays of Data: Pie Charts and Bar Graphs, Frequency Distributions
Week 3	Chapters 3, 4	Graphical Displays of Data: Line Graphs, Histograms, and Stem-and-Leaf Displays, Analyzing Graphs, Measures of Location, Measures of Dispersion
Week 4	Chapters 4, 5	Constructing Samples, Measures of Relative Position, Applying the Standard Deviation 4.8 Scatterplots and Correlation, Classical Probability
Week 5	Chapter 5	Probability Rules: Properties, Complement, and Addition Rules, Probability Rules: Independence, Multiplication Rules, and Conditional Probability, Basic Counting Rules
March		
Week 6	Chapters 5, 6	Additional Counting Techniques, Discrete Random Variables, The Binomial Distribution
Week 7		Midterm Exam (March 12th)
Week 8	Chapter 7	Introduction to the Normal Curve, Reading a Normal Curve Table, The Normal Distribution, z-Transformations
April		
Week 9	Chapters 8, 9	The Distribution of the Sample Mean, The Distribution of the Sample Proportion, Interval Estimation of the Population Mean 9.4a Student's t-Distribution
Week 10	Chapter 9	Interval Estimation of the Population Mean: Small Samples, Sigma Unknown, Precision and Sample Size: Means, Estimating the Population Proportion
Week 11	Chapter 10	Developing a Hypothesis and Reaching a Conclusion, Testing a Hypothesis about a Population Mean (z-Value), Testing a Hypothesis about a Population Mean (t-Value), Testing a Hypothesis about a Population Mean (P-Value)
Week 12	Chapter 10	Testing a Hypothesis about a Population Proportion (z-Value), Testing a Hypothesis about a Population Proportion (P - Value), Interval Estimation about a Population Variance, Testing a Hypothesis about a Population Variance
May		
Week 13		Final exam (May 6th)

Table 3: Readings