Title of Course, Course Number, and Number of Credits
Business Statistics II, ECON 2110, 3 credits

Instructor
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Description of the Course
A continuation of ECON 2100 – Business Statistics I. Topics covered include one-sample and two-sample tests of hypothesis, ANOVA, simple and multiple linear regression, and non-parametric methods such as Chi-square applications and the analysis of ranked data. Optional topics are index numbers, time series and forecasting, quality control, and an introduction to decision theory.

Course Prerequisite
ECON 2100 – Business Statistics I

Course Objectives
Statistical concepts are frequently used in economic, social science and business contexts. Business Statistics II is a continuation of the study of these widely-used concepts begun in Business Statistics I and will give the student a better understanding of the probabilistic nature of events and how statistics can be used to understand these events. A student who successfully completes this course should feel much more comfortable in reading about economics, the social sciences and business. S/he should also be able to read more critically about these subjects, using the statistical knowledge gained in this course.

The problems, examples, and projects used in this course are specifically designed to help students apply their newly-gained knowledge and skills to business and economic situations. This knowledge should then help them in future courses, as well as in the business world and beyond.
**Student Learning Outcomes**

By the end of this course, students should be able to:

♦ Construct a hypothesis.
♦ Conduct a test of hypothesis about population parameters, both using the five-step procedure and the p-value.
♦ Understand Type I and Type II errors and discuss their relationship.
♦ Carry out a hypothesis test for the equality of two population variances.
♦ Organize data into ANOVA tables.
♦ Understand and interpret the terms dependent and independent variable.
♦ Calculate and interpret the coefficient of correlation, the coefficient of determination, regression coefficients, the regression line, and the standard error of estimate.
♦ Conduct a test of hypothesis to determine whether regression coefficients are statistically significantly different from zero.
♦ Describe the relationship between several independent variables and a dependent variable using a multiple regression equation.
♦ Utilize the Chi-square distribution for goodness-of-fit tests.
♦ Apply nonparametric methods to analyze ranked data.
♦ Use Microsoft Excel to carry out the above techniques as applicable.

**Academic Integrity**

Violations of the Academic Integrity Policy (a.k.a. cheating in its various forms) will be severely punished. The *minimum* penalty is a grade of zero on the assignment in question, but it can go up to expulsion from the university. If you have not done so yet, please familiarize yourself with the Academic Integrity Policy (available online at [http://www.wpunj.edu/dotAsset/230122.pdf](http://www.wpunj.edu/dotAsset/230122.pdf)). All parts of that Policy are relevant and important, but for the online setting of the class, I especially would like to stress sections II.B. (on plagiarism) and II.C. (on collusion). Please make sure that you truly understand what all parts of the policy mean. To name a few examples, working together with another student on an assignment, getting help on an assignment from someone else (e.g., a tutor), and copying another student’s work are all violations of the Academic Integrity Policy.

**Teaching Methods and Expectations on Student Participation**

The course will be conducted in the following format: I will post notes for each chapter that will describe the main features of the chapter, examples, some references to additional readings, and practice problems. There will be class discussions of some topics using the Discussion Board in Blackboard.

You are required to access the Blackboard pages daily to check for announcements and other postings such as assignments. I strongly encourage you to keep up with the course since the material that is covered in about fifteen weeks in a fall or spring semester is compressed into about three weeks.

**Notes on Technology**

This online course will be conducted via Blackboard. If you have any problems, please click on the “Student Support” link below the login fields at bb.wpunj.edu. (You may need to scroll down a little.) You will find descriptions of many features as well as a link to contact the Help Desk.

The documents that I will be posting will typically be files in Microsoft Office format. The assignments that you submit must be in a format that I will be able to open with Microsoft Office 2010 products. **For some of the assignments, Microsoft Excel—in particular Excel’s Data Analysis feature—is required.** Users of Apple products are especially urged to ensure early on that they can use that feature since it may require extra steps.
Methods of Student Evaluation
The course grade is determined by your performance on the following items which follow the timetable on the next page. Please note that there will be no extra credit assignments.

Assignments: 90 points
There will be four (4) assignments, which will take the form of short-answer questions in which you describe a method we covered, calculate a numerical example, compare results from different methods, etc. For some of the assignments, Microsoft Excel—in particular Excel’s Data Analysis feature—is required. Users of Apple products are especially urged to ensure early on that they can use that feature since it may require extra steps.
Points for the individual assignments will vary and the emphasis will be on the material from Chapters 10 and 11 as well as 13 and 14.
You will submit your assignments by attaching them to an e-mail to me (GritschM@wpunj.edu). Assignments are due at 11:59 p.m. Eastern Time on the day specified.

Late submission policy: Your grade for an assignment will be lowered by three (3) points for each day that the assignment is turned in after the due date (including Saturdays and Sundays).
If I have not received one of your assignments at the end of the course, you will receive a score of zero (0) on that assignment.

Participation: 10 points
Two (2) times during the course, we will have an online discussion on a topic that is related to the course material. You will need to make at least two separate, meaningful posts to the Discussion Board in each of these online discussion periods to earn full credit (5 points per discussion).

In assigning your course grades, I will use the following grading scale:
93-100: A
90-92: A-
87-89: B+
83-86: B
80-82: B-
77-79: C+
73-76: C
70-72: C-
67-69: D+
60-66: D
0-59: F
### Timetable Including Due Dates

<table>
<thead>
<tr>
<th>Date</th>
<th>Readings* and Practice Problems</th>
<th>Assignment Available</th>
<th>Assignment Due</th>
<th>Discussions</th>
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<tbody>
<tr>
<td>Monday, December 22</td>
<td>Chapter 10: One-Sample Tests of Hypothesis</td>
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<td>Tuesday, December 23</td>
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<td>Wednesday, December 24</td>
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<td>Thursday, December 25</td>
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<tr>
<td>Friday, December 26</td>
<td>Chapter 11: Two-Sample Tests of Hypothesis</td>
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<td>Start Discussion 1</td>
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<td>Saturday, December 27</td>
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<td>Sunday, December 28</td>
<td>Chapter 12: Analysis of Variance</td>
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<td>Monday, December 29</td>
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<td>Tuesday, December 30</td>
<td>Chapter 13: Correlation and Linear Regression</td>
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<td>Thursday, January 1</td>
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<td>Saturday, January 3</td>
<td>Chapter 14: Multiple Regression Analysis</td>
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<td>Monday, January 5</td>
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<td>Start Discussion 2</td>
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<td>Wednesday, January 7</td>
<td>Chapter 15: Nonparametric Methods: Nominal Level Hypothesis Tests</td>
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<td>Thursday, January 8</td>
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<td>Friday, January 9</td>
<td>Chapter 16: Nonparametric Methods: Analysis of Ordinal Data</td>
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<td>Saturday, January 10</td>
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<td>Sunday, January 11</td>
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* The chapters refer to *Statistical Techniques in Business and Economics*, 16th ed. Boston: Irwin, McGraw-Hill, 2014 by Douglas Lind, William Marchal, and Samuel Wathen. *Note that purchasing the textbook is a course requirement.* Additionally, readings other than the textbook may be assigned.