WASHINGTON COLLEGE

**Course Syllabus**

**BUS204 Quantitative Methods II – Spring 2014**
**MWF 2:30 p.m. – 3:20 p.m. Goldstein 100**


| | |
|---|---|
| Instructor: | Stephen D. Winand, M.B.A. |
| Office: | Daly 216 C |
| Office Hours: | MW 11: 00 a.m. - 12:00 p.m., and by appointment |
| Email: | swinand2@washcoll.edu |
| Office Phone: | (410) 778-8984 |


Text: Anderson, Sweeney, Williams, *Essentials of Modern Business Statistics with Microsoft Excel, 5e*, 2012

Course Description

How do business managers make decisions? Compare alternatives? Determine best strategies? In Quantitative Methods II, we'll look at ways in which to use numerical data to answer these questions.

This course, the second of a two-part series, covers the study of data analysis, models and decision making with business applications, using Microsoft® Excel. Topics include statistical inference, hypothesis testing, analysis of variance, regression analysis, and statistical quality control. This course presents both concepts and business application of statistical methods.

You will learn how to use the data gathered through sampling to make inferences about population parameters. You will learn how to design experiments that will enable you to answer business questions, and use analysis of variance to draw conclusions about the experiments. In this semester, you will be introduced to regression, one of the mainstays used in understanding the relation between specific inputs and an outcome, and an important tool for predicting future outcomes.

An emphasis is placed on the use of Excel when we cover regression; while exams will be "paper" exams, you will be expected to be familiar with Excel output and to be able to interpret the output from Excel functions. Finally, you will be introduced to a practical use of statistical analysis, statistical process control.

## Course Objectives

By the end of this course, you will be able to

- Describe the difference between descriptive and inferential statistics
- Identify the symbols for commonly used population parameters and sample statistics
- Define the purposes of the following analytical tools and use them to solve problems
    - Sampling distributions (Chapter 7)
    - Confidence intervals (Chapter 8)
    - Hypothesis testing (Chapter 9)
    - ANOVA (Chapter 10)
    - Simple and Multiple Linear Regression (Chapters 12 and 13)
- Construct and implement a research project using statistical sampling methods, create a proposal to the Review Board for Research on Human Subjects, and apply the analytical tools you learned to analyze the data collected
- Apply these statistical tools in a real-world setting by constructing control charts.

## Honor Code

When you joined Washington College, you pledged to uphold the Honor Code – I expect you to live up to your word. Your commitment is reflected by attaching the following pledge to all work submitted, along with your signature:

*"I(we) pledge (my) our word of honor that I(we) have abided by the Washington College Honor Code while completing this assignment."*

While I encourage you to study and work on homework together, the intent is that you help each other to understand the material, not supply answers to each other. You are permitted to help others and accept help from others during Brief Collaborative Quizzes (BCQs). All other work is to be your own individual effort, or the combined effort of members of your group.

## Grading Components

| | |
|---|---|
| Exam I | 25% |
| Exam II | 20% |
| Final Exam | 25% |
| Group Project | 20% |
| Quizzes | 5% |
| Experiential Events | 5% |

Final grades will be computed using the weightings shown above. Letter grades will be determined using the following numerical conversions.

| | | | |
|---|---|---|---|
| 99 to 100 = A+ | 82 to 87.9 = B | 70 to 71.9 = C- | 59.9 or Below = F |
| 92 to 98.9 = A | 80 to 81.9 = B- | 68 to 69.9 = D+ | |
| 90 to 91.9 = A- | 78 to 79.9 = C+ | 62 to 67.9 = D | |
| 88 to 89.9 = B+ | 72 to 78.9 = C | 60 to 61.9 = D- | |

I reserve the right to use subjective evaluation on the mastery of the subject matter to assign or remove +'s and - 's to grades beyond just the numerical calculation.

Grades will be posted on Canvas. Please review your grades throughout the semester and feel free to contact me if you have any questions. Exam grades are generally posted by the next class period; homework grades are posted the same day homework is collected.

Exams

Exams are administered via Canvas, covering groups of chapters as noted on the accompanying schedule. I will supply you with any reference material you may need, such as formulae. You will need to bring your own calculator. You will be asked to demonstrate your knowledge and understanding of key terms, to apply statistical techniques to solve business problems, and to analyze the results of Excel-produced statistical output. **Exams will be "paper" exams** – while you may be asked to interpret Excel results, you will not use Excel to take the exams.

Group Project

Detailed information on the group project will be provided separately. The project will include the design of primary research which will require you to collect and analyze survey information. Time will be allowed in class to work on the group project and you may ask questions of the instructor. You will need to create a proposal to submit to the Review Board for Research on Human Subjects; **part of the grade for this project will be based on your timeliness in meeting this requirement.**

Calculators

Calculators are acceptable for use in class and for tests. Calculators should be suitable for computing business functions including but not limited to square root, exponents, etc. Use of cell phone calculators is not acceptable. Be prepared, if your battery dies, I do not provide loaner calculators.

Homework

Think of homework problems as practice, just like practice for sports or musical performances. If you don't practice regularly and earnestly, it shows. I encourage you to study together because you can help each other by thinking through the homework problems and discussing various methods of attack. But remember, if you simply rely on your study mates to solve problems, then they will be prepared for the exams, not you. Each student is expected to create his or her own Excel spreadsheets.

You should come to class prepared to demonstrate the solution of the problems, or prepared with specific questions about places where you encountered difficulty. It's not sufficient to say, "I don't know how to do this." **Here are a couple of good questions:** "I'm not sure how to find the correct inputs to the problem" "There are two equations that are very similar – how do I know which is the correct one to use?"

We have a lot of material to cover this semester and it is important that you keep up. And don't worry – if you have a question, then undoubtedly one or more of your classmates have the

same question and they'll thank you for bringing it up! The Self Test questions at the end of most sections are very helpful in getting you started.

Quizzes

Quizzes will be administered via Canvas and will be given randomly and unannounced throughout the semester. . **Because these quizzes are unannounced, you will need to be present in class in order to take them**. If you are absent the class the quiz is announced, I will not accept your submission.

Experiential Events

Over the course of the semester you will be expected to attend two college events that take place outside of the classroom that enrich your learning experience, and write a one-page response paper describing the event. An example of such an event is the SIFE Career Expo, an event that helps you prepare for the Career Fair. I encourage you to review the College events calendar as well. I will periodically send notices of on campus events for you to attend. Don't wait until the end of the semester! I will not accept experiential event submissions after the last class of the semester.

Attendance Policy

**You need to come to class.** The material in each class builds a foundation for subsequent material; therefore, missing classes means that you might miss skills required in later courses such as Financial Analysis and Strategic Management. You are allowed to miss class three times over the course of the semester for any reason. If you miss class more than three times, you will lose one percentage point of your final grade for each class missed, regardless of the reason for the absence. That might not sound like much but it could make a difference in your letter grade (ex. going from 90.2 to 89.2 means going from an A- to a B+).

If you are absent, it is your responsibility to complete assignments and get notes from other students. **Students on probation must attend all classes without exception.**

Any exception to this policy will be made on an individual basis.

Cell Phones

Cell phones should be turned off, set to vibrate or silent while in class. Ringing phones will disrupt concentration and interrupt the continuity of the class. Texting or game playing in class will not be viewed favorably. Your attention should be on the concepts being discussed. **If you are texting, playing games, or other cell phone use in class, you may be asked to leave the class.** Any assignments completed for credit will not be accepted or allowed to be made up.

Learning Differences

If you are in need of special accommodations because of a documented learning disability or physical disability, please see the Director of the Office of Academic Skills (2nd Floor, Miller

Library). Once approved, the accommodation plan will be developed. It is your responsibility to share the accommodation plan with me prior to the due date for assignments.

Communications/Help from Your Instructor

Please check your email frequently; I occasionally send broadcast emails to clarify homework assignments or to announce schedule changes. I use Canvas to post materials such as, homework solutions for you to check your work, handouts from class, and grades.

Your best strategy for success is to review new material before class, complete all of your assignments, and ask questions about course content. This is a problem-solving course – to do well, you will have to consistently invest the time in learning and applying the material. **As with all four credit courses, you are expected to invest an average of three hours of work outside of class for every hour you spend in the classroom**.

If you still have questions about the material, please feel free to visit with me, either during my office hours or by appointment. Remember that we also have both a Math Center and an office of Academic Skills where there are tutors who can help you. Both resources are located in the Miller Library.

Schedule

I will provide a schedule for a complete list of topics to be covered, homework assignments and due dates for major items. This list is subject to change; any changes made will be announced in advance in class.

| | | | |
|---|---|---|---|
| | | **BUS204 Quantitative Methods II- Spring 2014** | |
| | | **Section 10 - MWF 2:30 p.m. - 3:20 p.m.** | |
| | | Schedule | |
| | | **Subject to Revision - Changes will be announced in class** | |
| | | | |
| **Day** | **Date** | **Topic** | **Homework** |
| Monday | 1/20/2014 | Distribute syllabus - review schedule | |
| | | **Sampling, and Estimation** | |
| Wednesday | 1/22/2014 | Review Chapter 6 Concepts - Normal and Standard Normal Probability Distr. | |
| Friday | 1/24/2014 | 7.1/7.7 Sampling Methods; Descriptive vs Inferential Statistics | |
| Monday | 1/27/2014 | 7.2 Simple Random Sampling/7.3 Point Estimation | 7.2: 5/ 7.3: 9,11,13 |
| Wednesday | 1/29/2014 | 7.4 Introduction to Sampling Distributions | |
| Friday | 1/31/2014 | 7.5 Sampling Distribution of x bar | 7.5: 21, 22, 24, 25 |
| Monday | 2/3/2014 | 7.6 Sampling Distribution of *p* bar | 7.6: 32, 33 |
| Wednesday | 2/5/2014 | **Group Project Introduction** | |
| Friday | 2/7/2014 | 8.1 Population Mean: σ known | |
| Monday | 2/10/2014 | 8.1 Population Mean: σ known | 8.1: 5, 8, 10 |
| Wednesday | 2/12/2014 | 8.2 Population Mean: σ unknown | 8.2: 16, 18, 19 |
| Friday | 2/14/2014 | **Group Project Work** | |
| Monday | 2/17/2014 | 8.3 Determining the Sample Size | 8.3: 26, 27, 28 |
| Wednesday | 2/19/2014 | 8.4 Population Proportion | 8.4: 37, 42,43 |
| Friday | 2/21/2014 | Exam Review: Chapters 7 and 8 | |
| Monday | 2/24/2014 | **Exam 1: Chapters 7, and 8** | |
| Wednesday | 2/26/2014 | **Exam Debriefing/Group Project Work** | |
| | | **Hypothesis Tetsting and Analysis of Variance** | |
| Friday | 2/28/2014 | 9.1: Developing Null & Alternative Hypothesis/ 9.2: Type I & Type II Errors | 9.1: 3,4 /9.2: 6,7,8 |
| Monday | 3/3/2014 | 9.3 Population Mean: σ known | 9.3:12, 16, 17 |
| Wednesday | 3/5/2014 | 9.4 Population Mean: σ unknown | 9.4: 28, 30, 32,33 |
| Friday | 3/7/2014 | 9.5 Population Proportion | 9.5: 37, 39, 40, 45 |
| Monday | 3/10/2014 | **Spring Break - No Class** | |
| Wednesday | 3/12/2014 | **Spring Break - No Class** | |
| Friday | 3/14/2014 | **Spring Break - No Class** | |
| Monday | 3/17/2014 | 10.4 Introduction to Analysis of Variance | |
| Wednesday | 3/19/2014 | 10.5 Analysis of Variance: Testing for the Equality of *k* Population Means | 10.5: 28, 30, 33, 34 |
| Friday | 3/21/2014 | Exam Review Chapters 9 and 10 | |
| Monday | 3/24/2014 | **Exam 2: Chapters 9 and 10** | |
| Wednesday | 3/26/2014 | **Exam Debriefing/Group Project Work** | |
| Friday | 3/28/2014 | 12.1 Simple Linear Regression Model/12.7 Excel's Regression Tool | 12.7 40a.b.,41a., 42a. |
| Monday | 3/31/2014 | 12.2 Least Squares Method/12.3 Coefficient of Determination | 12.2: 2, 7, 12, 14/12.3: 16, 19, 20, 22 |
| Wednesday | 4/2/2014 | **Advising Day - No Classes** | |
| Friday | 4/4/2014 | **Group Project Work** | |
| Monday | 4/7/2014 | 12.4 Model Assumptions/12.8 Residual Analysis: Validating Model Assumptions | 12.8: 49 |
| Wednesday | 4/9/2014 | 13.1 Multiple Regression Model/13.2 Least Squares Method/13.3 Multiple Coefficient of Determination | 13.2: 6, 9, 10/13.3: 16, 17, 18 |
| Friday | 4/11/2014 | 12.5/12.6/13.5 Testing for Significance | 12.5: 27/12.7: 40c.d.e., 41b.c., 42b.c.d./13.5: 24, 26 |
| Monday | 4/14/2014 | 13.7 Qualitative Independent Variables | |
| Wednesday | 4/16/2014 | **Group Project Work** | |
| | | **Applied Statistical Analysis** | |
| Friday | 4/18/2014 | Statistical Methods for Quality Control | TBA |
| Monday | 4/21/2014 | Statistical Methods for Quality Control | TBA |
| Wednesday | 4/23/2014 | **Group Project Work** | |
| Friday | 4/25/2014 | **Group Project Work** | |
| Monday | 4/28/2014 | **Group Project Due/Exam Review Chapters 12 and 13** | |
| Wednesday | 4/30/2014 | **Final Exam** | |