MgtOp 215 **BUSINESS STATISTICS** **Spring 2018**
Lecture 2 (MWF: 9.10-10.00): Labs 4, 5, 6 (GOLDEN)

Instructor Dr. Sung K. Ahn, Todd 466, 335-6819,
e-mail: ahn@wsu.edu
Home-page: https://faculty.business.wsu.edu/ahn/classes/

Office Hours MWF: 11.30 – 12.30 or by appointment
(My door is always open to you. You are welcome to visit my office any time during the day if you need help with statistics.)

Catalog Course **MgtOp 215 Business Statistics** 4 (3-2) Course Prerequisite: MATH 201, 202,
Description 171, or 172; MIS 250 or concurrent enrollment. Data presentation, probability, distributions, inferences, and linear regression as applied to business and economics.

Textbook Required: *Business Statistics: Concepts and Applications, 13th ed., by Berenson, Levine, and Szabat (2013) (The Second WSU Custom Edition with access code for MyStatLab® and PHStat® may be purchased at the Bookie.)*

Grading Two mid-terms (22.5% each), Final (35%), Assignments (15%), Quizzes (5%)

Scale A: 93+, A-: 90 to <93, B+: 87 to <90, B: 83 to <87, B-: 80 to <83,
C+: 77 to < 80, C: 73 to < 77, C-: 70 to < 73, D+: 67 to < 70, D: 60 to <67,
F: < 60 (I reserve the right to change the grading scale slightly, if I wish.)

Tests The tests will be closed book and notes; you may be allowed summary sheets.
The general content and format of the tests will be announced. The final exam will be comprehensive. There will be no make-ups unless you are in a dire emergency: it is your responsibility to inform me of such emergencies as soon as possible. The first mid-term exam will be on: Thur., Feb. 15 and the second mid-term exam on Thur., Mar. 29, both starting at **6**:00 p.m.   The final exam will be on Tue., May 1 starting at 7:00 a.m. (Unless you have three or more final exams on May 1, you must take the final exam on May 1. There is no exception on this policy).

Attendance Class and lab attendance are required. Attendance is will be checked randomly.
Students who attend all the classes randomly checked will receive 3% extra credit toward the final grade. Each absence will result in a loss of 0.5% extra credit. To get the attendance credit you must come to class (and lab) on time and remain until the end of class (and lab). Students with excused absences will not lose the attendance credit. (Excused absences are absences with "reasonable excuses" such as absences attributable to school-related activities, sickness, and situations out of students' control. Students are expected to notify me as soon as possible, preferably beforehand, about an excused absence.)

Quiz Almost every week a quiz will be given in the lab. Quizzes are worth 5% toward the final grade, and the two with the lowest scores will be dropped. Questions on a quiz will be very similar to homework problems turned in the previous week and returned during the lab session. Quizzes will be open book but closed notes. There will be no make-up for missed quizzes under any circumstance. (If you

miss a quiz even if you have "reasonable excuses," you need to take a zero on the quiz and drop it as one of the lowest scores. This is the reason to allow two lowest quizzed dropped.)

Assignments   Assignments consist of on-line assignments worth 10% toward the final grade, and hard-copy assignments worth 5%. On-line assignments must be completed using MyStatLab®. Go to the following web address and register: http://www.mystatlab.com and enter the course ID: **ahn40921**. On-line assignments will be made available a few hours after each class and will be due by 9 a.m. on Wednesday of the following week. No late on-line assignments can be submitted. For hard copy assignments, you are required to show your work in 'gory' detail. No credit will be given without proper work shown clearly. Hard-copy assignments are due at the beginning of class every Wednesday. Hard-copy assignments not turned in at the time they are collected are considered late. (If you come to class late on Wednesday after assignments are collected, yours is late.) Late hard copy assignments turned in by 5 p.m. on the same day of collection will be given 80% and on the next business day 50% of the credit. Any hard copy assignments more than one day late will not be collected nor be graded under any circumstances, unless an arrangement for an extension is given prior to the due date. Assignments are mostly from the textbook and will be assigned during the class: it is your responsibility to keep track of all the problems assigned. Some assignments require the use of MS Excel/PHStat.

Lab   The lab is designed to supplement the lecture: more examples and some solutions to the assignments will be provided; extensive discussion of the use of MS Excel/PHStat will be given; and quizzes will be administered.
      Section 4: F 11.10 – 13.00   Todd 330
              5: F 13.10 – 15.00   Todd 330
              6: F 15.10 – 17.00   Todd 330

Handout   Each handout will be distributed only once. Because of absences or other reasons, if you do not have handouts, you may pick one up from the box outside of my office (while they last) or download a PDF file from my home page.

Calculator   A calculator with statistics functions (such as mean and standard deviation) and math functions (such as logarithm, exponent, and combination) is strongly recommended.

Summary Sheets   For the exams you will be allowed to bring a summary sheet. Only formulae, definitions, theorems, and rules are allowed on summary sheets. No examples, especially, numerical examples, or solutions of homework or sample tests are allowed. (Violation of this is considered as cheating and will result in the forfeit of the final grade.) The summary sheets with your name on them must be turned in along with the exams. Even though summary sheets are allowed for the tests, try to memorize formulae, definitions, theorems, and rules.

T.A.   Mr. Gihan Edirisinghe   Office: Todd 477
      Phone: 335-1185   Email: gihan.edirisinghe@wsu.edu
      Office hours: M Th: 10-11 a.m., Tu: 3 - 4 p.m.

Math Skills Assessment	It is designed to assess your math skills. You are expected to have the good knowledge of the topics covered in the assessment. If not, you should review them by yourself. You are required to turn in the blue math skills assessment sheet. Otherwise, you will not get the course grade.

Instructor-specific expectations: During the class or lab, activities unrelated to this course such as using (smart) cell phones, text messaging, surfing the Internet, or reading newspapers or books (from other classes) are not allowed. Students engaged in such activities will be given a warning once, and given a lower grade by one letter grade per engagement of such activity after the first warning. (If a student is getting an A grade and has three violations, that student's will be a B+.)

Cheating: Cheating is defined in the Standards for Student Conduct WAC 504-26-010 (3). In MgtOp 215, cheating includes but not limited to the following actions which are thus considered as the violation of WSU academic honor code:
1. The inclusion of the items that are not allowed in the summary sheets of the exams,
2. Submission of assignments that are not the submitter's own work,
3. Copying other students work, however minor, during the exam,
4. Signing in for class on other student's behalf.

WSU General Honor Code: Academic integrity is the cornerstone of the university and will be strongly enforced in this course. Any student found in violation of the academic integrity policy will receive a grade of zero on the assignment or exam in question. A second offense, or an egregious first offense, will result in a grade of "F" for the course.   I report all offenses to the Office of Student Affairs. The penalty for violating the honor code is severe. The first offense will result in a grade of zero on the assignment in question. A second offense, or an egregious first offense, will result in a failing grade for the course. I will report all offenses to the Office of Student Affairs.

Students with Disabilities: Students with Disabilities: Reasonable accommodations are available for students with a documented disability. If you have a disability and need accommodations to fully participate in this class, please either visit or call the Access Center (Washington Building 217; 509-335-3417; http://accesscenter.wsu.edu, Access.Center@wsu.edu) to schedule an appointment with an Access Advisor. All accommodations MUST be approved through the Access Center.

Safety and Emergency Notification: Washington State University is committed to enhancing the safety of the students, faculty, staff, and visitors. It is highly recommended that you review the Campus Safety Plan (http://safetyplan.wsu.edu/) and visit the Office of Emergency Management web site (http://oem.wsu.edu/) for a comprehensive listing of university policies, procedures, statistics, and information related to campus safety, emergency management, and the health and welfare of the campus community.

Course Objectives:

The course provides an introduction to statistical thinking and methods for business students. Data collection and descriptive summary, modeling data by various probability distributions, statistical inferences, modeling variables for examining relationships and forecasting will be discussed. Statistical thinking and concepts will be presented whenever appropriate. The emphasis is on developing critical thinking and analytical skills for students as well as broadening the statistical knowledge of students. The goals to be accomplished in this course are:

- To summarize and present data in a meaningful way.
- To practice a scientific approach to problem formulation and solution.
- To understand and apply basic statistical methods to business and economic related problems.
- To learn information processing skills for data analysis with computer software and Internet.

This course meets Learning Goal 1 of the College of Business: Graduates will be able to solve business problems, supported by appropriate analytical techniques.

	At the end of this course, students should be able to:	Course topics (and dates) that address these learning outcomes are:	This outcome will be evaluated primarily by [assignment or activity]:
LG1	Use descriptive statistics to summarize and present data informative for business decision making	Descriptive statistics with data summary and numerical measures (Weeks 1- 3)	Assignments, quizzes, and exams
LG2	Understand the nature uncertainty	Basic probability concepts and Bayes' rule (Weeks 4 and 5)	Assignments, quizzes, and exams
LG3	Understand concepts or random variables and their application in uncertain business decision making	Probability distributions: discrete and continuous distributions (Weeks 5 – 7)	Assignments, quizzes, and exams
LG4	Understand the sampling distributions of the behavior of statistics and estimators;	Central limit theorem and sampling distributions and (Week 8)	Assignments, quizzes, and exams
LG5	Understand and apply statistical inferences in business decision making	Confidence intervals and hypothesis tests (Weeks 9-12)	Assignments, quizzes, and exams
LG6	Understand and apply regression analysis in business decision making	Correlation and inference based simple linear regression (Weeks 13-15	Assignments, quizzes, and exams

By accomplishing the above goals, you also will advance toward the *University* Learning Goals of 2) Critical and Creative Thinking.

The course serves as a prerequisite of business core courses: FIN 325 (Finance) and MgtOp 340 (Operations Management). Also, it is a prerequisite of advanced business courses: ACCTG 338 (Cost Accounting), MgtOp 412 (Statistical Methods for Management), MgtOp 418 (Quality Improvement for Management), HBM 491 (Operational Analysis), MKTG 368 (Marketing Research) and MgtOp 450 (Personnel and Human Resources Management).

MgtOp 215   **Course Outline**   **Spring 2018**

Dates	Chapters	Topics
Jan. 8		Class organization, Math skills assessment
10	1	Introduction of Statistics
12	2	Data and collection
15		No Class (MLK Holiday)
17		Stem-and leaf plot, Frequency distributions
19		Histogram, Ogive, Categorical data representation
22	3	Measures of Center and Dispersion
24		Measures of Center and Dispersion
26		Chebychev's theorem, Empirical rule, z-score
29		Percentiles, Box plot, Covariance and Correlation
31	4	Introduction to probability
Feb. 2		Probability rules and compound events, Conditional probability
5		Marginal probability, Multiplicative rule, with/without replacement
7		Independence, Bayes's rule
9	5	Random variable, Probability distribution, Expected value
12		Variance, Bernoulli r.v., Combination
14		Binomial distribution
15 (Thur.)		**Night Exam at 6:00 p.m.**
16		Poisson distribution
19		No Class (Presidents' Day Holiday)
21	6	Continuous random variables, Uniform random variable
23		No Class
26		Standard Normal distribution and its probabilities and percentiles
28		Probabilities and percentiles of the normal r.v.
Mar 2	7	Sampling distributions of the sample mean and proportion, CLT
5	8	Confidence intervals for the mean
7		z-interval, t- distribution, t-interval
9		C.I. for the proportion
12, 14, 16		No Classes (Spring Break)
19		Sample sizes
21	9	Hypothesis, Type I and II errors,
23		Significance level, and Power, Procedure for testing
26		Hypothesis tests for the mean: z-tests
28		t-tests
29 (Thur.)		**Night Exam at 6:00 p.m**
30		No Class
Apr. 2		Tests for the population proportion
4	10	Inference about population the variance
6		Inference about two population: means and variances
9	13	Covariance and correlation
11		Simple linear regression model
13		Least squares estimation
16		Inferences about regression model
18		Prediction
20		Residual Analysis

Dates	Chapters	Topics
23		(continued)
25		Comprehensive example of SLRM
27		Review
May 1		**Final Exam starting at 7 a.m.**

Note: The class schedule is tentative and subject to change.
Lecture notes in PDF can be down loaded from my web page:
http://public.wsu.edu/~ahn/

**IF YOU HAVE ANY TROUBLE WITH THIS COURSE, PLEASE FEEL FREE
TO COME AND SEE ME. I DO WANT YOU TO DO WELL IN THIS COURSE.**

The following are some tips on being successful in this course.

- Keep up with the class. Each lecture is built up on previous lectures. So if you do not review material from previous lecture(s), you are very likely to get lost and do poorly. The best way of keeping up with the class is to review the previous lecture before you come to class and do homework problems as soon as they are assigned, even though homework is collected only once a week. That way, you will be able to identify what you have and have not understood, and have enough time to ask the T.A or me questions. More importantly, you will be able to keep up with the class.
- Do not miss class. If you have to, make sure to catch up before the next lecture. Each lecture is built up on the previous lectures. So if you miss class or do not review material from the previous lectures, you are very likely to get lost and have difficulty in this class.
- Do your own homework: in order to do well in this course you need practice, practice, and more practice. If you think you understand the material, you will probably get a D. If you do understand the material, you will probably get a C. If you understand the material and have practiced enough, you will probably get a B. If you have practiced more than those who get a B, you will probably get an A. This is because your grade will be mostly based on your performance on the tests. To perform well on the tests and quizzes, you need practice.
- Do not put off homework until the last minute: you need time to ask questions about problems with which you have trouble to me, the TA or your class mates.
- Study groups are encouraged, but make sure that you know how to do problems all by yourself, and more importantly, that you can actually do them.
- This is not a math course, even though a lot of math language is used for convenience. So throw away math anxiety if you have any.
- This is not a difficult course. As long as you keep up with the class, do your share of practice, and devote your time and effort enough for a 4 credit hour course, you will do great. (A one-semester credit hour class requires up to two hours of work outside of the class per week. So you should be willing to devote consistently up to 8 hours outside of the class and lab per week.) You can do it! So, have a positive attitude. If you know someone who did poorly in this course, ask that person how much effort was put into this course. The answer would be probably not much.