BA 240 Statistical Analysis - Leslie Lum
Winter 2013 Course Syllabus

Schedule
(Subject to adjustment – changes will be announced on Canvas class site – check the site often for announcements or extra credit opportunities)

Week	Topics	Homework due Tuesday	Homework due Friday	Exams and Project
Jan 2	Review syllabus and course requirements. Watch The Joy of Statistics http://www.gapminder.org/videos/the-joy-of-stats/ MODULE 1 Read Describing data 1.1, 1.2, 1.3, 1.4, 1.5. and 1.6 Read 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8 TI instructions for standard deviation p. 63		Resume 1.12, 1.14, 1.18, 1.24 (Classify scale as well) Solution manuals are available in the Business Study Center C207. Text data files are on mybcc.net	
Jan 7	MODULE 1 http://eagereyes.org/about Visualization of data.	2.57, 2.67, 2.83 Plot stem leaf and do mean, median, mode, variance and standard deviation. For 2.177 only use Excel to plot histogram, show mean, median and mode, up to plus and minus three standard deviation, identify outliers Worksheet A Summation	2.166, 2.175, and 2.176	**Jan 11 RAT 1** **Office visit completed by January. 18**
Jan 14	MODULE 2 Read Probability 3.1,3.4, 3.5, 3.6, 3.7 Read Discrete Probability Distributions 4.1, 4.2, 4.3, 4.4 Read Normal distributions 5.1, 5.2, 5.3, 5.4 TI Instructions for binomial p. 213	General Discrete 4.22, 4,36, 4.114, 4.116 For all problems, plot the entire distribution and show mean and plus and minus 3 std on graph. **Team Project Selection Jan 16**	Binomial 4.60, 4.61, 4.62, For 4.125 plot the entire distribution and show mean and plus and minus 3 std on curve on graph.	**Team Project Selection Jan 16**
Jan 21	MODULE 2 Instructions for TI normal curve p. 253 Test Review: **4.18 GD**, 4.22, 4.35, **4.57 BI**, 4.59, 4.61, 4.116, 4.117, **4.119** 5.111, 5.119, 5.125, 5.121	Worksheet B Binomial/General Discrete	Normal 5.38, 5.40, 5.42, 5.56, 5.60. For all problems, plot the distribution and show mean and plus and minus 3 std on curve on graph Worksheet C Normal Worksheet D Regression	**Jan 24 RAT 2**
Jan 28	MODULE 3 Read Central Limit - 6.1, 6.2, 6.3 Confidence Interval - 7.1, 7.2, 7.3, 7.4, 7.5		Central Limit 6.34, 6.38, 6.58, 6.64 (Due Friday) Large 7.16, 7.18, 7.22	**EXAM 1 Module 1 and 2– Jan 28 and 29** **(Exam will take two sessions)**
Feb 4	MODULE 3 Feb 6 Lab Location N209 10:30	Small 7.36, 7.38, 7.39 (Use Excel to do 7.39) Prop. 7.50, 7.54, 7.56 Sample size 7.70, 7.72, 7.74, 7.78.	Worksheet E Sample Means	Feb 8 RAT 3

Feb 11	MODULE 4 Read One population hypothesis testing - 8.1, 8.2, 8.3, 8.4, 8.5. Test Review problems: 7.89, 7.90, 7.91, 7.92, 7.93, 7.94, 7.99, 7.103, 7.75, 7.77, 7.79 8.145, 8.130, 8.131, 8.135, 8.138, 8.139, 8.144	**Individual Project due Feb 13**	Large 8.32, 8.34, 8.46 Small 8.64, 8.68. For all problems, draw curve, show mean, areas of rejection, decision rule, calculation of test statistic, and conclusion including p-value.	**Feb 15 RAT 4** **Individual Project due Feb 13**
Feb 18	MODULE 4 and start Module 5 Read: Two populations 9.1, 9.2, 9.3, 9.4, 9.5	Prop 8.80, 8.84.8.86 For all problems, draw curve, show mean, areas of rejection, decision rule, calculation of test statistic, and conclusion including p-value.	Worksheet F Single Population Hypothesis	**INDIVIDUAL EXAM 2 Module 3 and 4 Feb 21, 22**
Feb 25	MODULE 5 More than two populations 10.1, 10.2	Large sample 9.14, 9.110 For all problems, draw curve, show mean, areas of rejection, decision rule, calculation of test statistic, and conclusion including p-value.	Pooled Variance 9.20, 9.28, 9.134 Prop 9.58, 9.62, 9.66 For all problems, draw curve, show mean, areas of rejection, decision rule, calculation of test statistic, and conclusion including p-value.	
Mar 4	MODULE 5 and 6 Read Multiple Regression and Chi Square 11.1, 11.2, 11.3, 11.4, 11.5, 11.6, 11.7, 11.8 12.1, 12.2, 12.3, 12.4 **Lab Mar 6 Lab N209 10:30** **Do Class eval at bellevuecollege.edu/classeval**	Paired 9.41, 9.42, 9.46, For all problems, draw curve, show mean, areas of rejection, decision rule, calculation of test statistic, and conclusion including p-value.	ANOVA <u>More than two populations</u> 10.32, 10.34 For all problems, show null and alternate, areas of rejection, decision rule, calculation of test statistic, and conclusion including p-value.	**Mar 8 RAT 5**
Mar 11	MODULE 5 and 6	Regression 11.102, 11.111, 11.113 May be completed on Excel. Chi Square: 13.24, 13.26, 13.28 For chi square problems, state the decision rule, show calculation of test statistic, and conclusion including p-value.	Worksheet G Two population hypothesis Worksheet H Final Regression review sheet	**Draft Team Project due Mar 13** **(Peer eval done)**
Mar 18	Test Review: 9.112, 9.113, 9.115, 9.117, 9.118, 9.120, 9.121, 9.122, 9.123, 9.125, 9.127, 9.130 10.35, 10.39 13.46, 13.50	**Mar 18 Final Team Project due** Final Exam Review		**Mar 18 Final Team Project due** **Mar 20 at 9:30 am** <u>Comprehensive Final</u>

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Course Requirements

	Weight	Your score in points
2 exams (20% each) and one comprehensive final (25%) Individual exams are two pages of notes (4 sides 8 ½ X 11) which may NOT include the practice exams which must be turned in with the exam. You may use a calculator. Laptops and cell phones are prohibited.	650	
Individual (10%) and Team Project (5%) Detailed instructions and project template on mybcc.net course site. **(Instructor reserves the right to adjust points based on contribution.)** **Complete instructions on the Project are on mybcc.net in the Project file.** **Videos on how to use Excel to complete the team project are available at:** Website: http://ba240.groups.live.com Login: ba240student@live.com Password: 2013Winter No spaces "W" is capitalized. Once you signed in, click on documents.	150	
Individual Readiness Assurance Tests. Individual (5%).	50	
Individual Readiness Assurance Tests. Team (5%)	50	
Class activities including in-class worksheets, participation and attendance. Also included in personal office visits to instructor. (5%)	50	
Homework and worksheets. Homework must be turned in at the beginning of class on the date due. You must be in class to get credit for the homework. (5%)	50	
TOTAL	1000	

Math 138 is required for this course. BA 240 transfers as STATS 311 at UW and is a rigorous 300 level course that requires your full participation in class and on your own time.

Time and place   Morning Section: Daily 10:30 am C165

Contact   Telephone: 425-564-4063
Email: llum@bellevuecollege.edu
BE SURE TO PUT BA 240 IN SUBJECT HEADING OF EMAIL FOR MORE TIMELY RESPONSE.
Office mail: D110
I am frequently in my office so please drop by to see me.

Office hours   Office Location C207
Lum Office Hours: MTWTh 9:30 to 10: 20 pm or by appointment.

Lecture Videos   Video lecture Links provided on last page of syllabus

Project Excel Demos video lectures at:
Website: http://ba240.groups.live.com
Login: ba240student@live.com
Password:2013Winter
No spaces "W" is capitalized.
Once you signed in, click on documents.
Business Transfer Website: http://bellevuecollege.edu/business/transfer/default.htm

Required Texts	<u>Statistics</u> by McClave and Sincich, Pearson/Prentice Hall 2006 (This book may be rented from the bookstore) The **textbook data files** are posted in a zip file in the MyBCC.net course website. All problem files are under Exercises. To use, open Excel first and then in the drop down menu right above the Cancel button, go to the tope for All Files (*.*). Browse to find the text data files and open it. You may have to format the file into columns before using it.
Other Requirements	Scantrons for quizzes. Calculator that can calculate standard deviations. For instructions on TI-83 statistical functions: **http://www.angelfire.com/pro/fkizer/Instructions/tiusrmanstat83.htm**
Resources	The solution manual is available at the Business Study Center in C207K. The best students **make extensive use of the study center**. Check C207K for hours. **Review sessions** may be scheduled prior to exams. These are often conducted by instructors in other sections. Attend the review sessions to help you do better in the exams.

How to succeed in this course	– This course requires that you participate in class. You will be called upon to answer questions and complete problems on the board.
	– This course requires that you work in teams for a project. Teams will be selected by the instructor and you will be expected to behave according to professional workplace standards in dealing with your team members. This includes in-class, out-of-class, and in email communication.
	– <u>Review all materials for a module answering the questions on your reading guide BEFORE</u> we cover the module. You will be tested on your reading on the individual and team RAT.
	– We will spend two to three sessions on each module applying the concepts that you have learned.
	– Your grade will be based on your individual Readiness Assurance Test, your team RAT, team problem solving and casework, team project, 3 individual exams.
	– The Team Project requires that you apply what you learn to real problems or issues. This requires that you apply research, analysis and evaluation skills that will be required in your professions.
	You must take **personal responsibility** for your learning to succeed in life:
	  • Attend all classes and participate fully in the team process
	  • Use the reading guide to read textbook sections, view video lectures and do homework before and during Module work WITHOUT the solution guide.
	  • Help your team members learn. You learn the most when you teach others the concepts.
	  • Do all supplemental problems at the end of the chapter in review for the test
	  • Do practice exams without consulting key
	  • Go to the Business Study regularly to study with tutors

Grading	95 - 100%	A	4
	90 - 94	A-	3.7
	86 - 89	B+	3.3
	83 - 85	B	3.0
	80 - 82	B-	2.7
	76 - 79	C+	2.3
	73 - 75	C	2.0
	70 - 72	C-	1.7
	66 - 69	D+	1.3
	60 - 65	D	1.0
	Below 60	F	0

A pass grade will not be given unless <u>all requirements</u> of the course are completed.

Standard of Behavior   All interactions will be evaluated as to whether they are acceptable in the business environment. This includes interactions in the class, on online discussion forums, email communications, with the instructor, with fellow students, and in the community. Inappropriate communications include jokes and discussions your classmates find offensive, excessive messages, and other communications which would be typically deemed inappropriate in the workplace. The student will be informed and expected to comply with requests for change and improvement. Cell phone and laptops are not to be used in the class.

Student Code   Cheating includes, but is not limited to, copying answers on exams, glancing at nearby exams, turning in assignments or papers that have been used in other classes, and giving or receiving help during an exam. Cheating includes, but is not limited to, purchasing or selling notes, assignments or examination materials. Having a cell phone in view for any reason during an exam will result in a zero in the exam.

Stealing includes, but is not limited to, taking the text, notes, exams, library books or other personal property of others without their permission.

Plagiarism is presenting the words, ideas, and/or work of others as if it is an individual's own work. It includes, but is not limited to, using other's papers as one's own and including parts of published works without giving credit where credit is due.

If you choose to cheat, steal or plagiarize, or if you assist anyone in cheating, the following actions will be taken:
You will receive zero on the assignment or assessment.
A report of the incident will be forwarded to the Dean of Student Services. He/she may file the report in your permanent record and/or take further disciplinary action.
If you feel you have been unfairly accused of any of the above, you may appeal. For a description of due process, see WAC 132H-120, available in the Dean's office.

"Cheating, stealing and plagiarizing (using the ideas or words of another as one's own without crediting the source) and inappropriate/disruptive classroom behavior are violations of the Student Code of Conduct at Bellevue College. Examples of unacceptable behavior include, but are not limited to: talking out of turn, arriving late or leaving early without a valid reason, allowing cell phones/pagers to ring, and inappropriate behavior toward the instructor or classmates. The instructor can refer any violation of the Student Code of Conduct to the Vice President of Student Services for possible probation or suspension from Bellevue College. Specific student rights, responsibilities and appeal procedures are listed in the Student Code of Conduct, available in the office of the Vice President of Student Services." The Student Code, Policy 2050, in its entirety is located at:
http://bellevuecollege.edu/policies/2/2050_Student_Code.asp

Affirmation of Inclusion   Bellevue Community College is committed to maintaining an environment in which every member of the campus community feels welcome to participate in the life of the college, free from harassment and discrimination. We value our different backgrounds at BC, and students, faculty, staff members, and administrators are to treat one another with dignity and respect.

Code of Honor   By being a student in this course you acknowledge that you are a part of a learning community at Bellevue College that is committed to the highest academic standards. As a part of this community, you pledge to uphold the fundamental standards of honesty, respect, and integrity, and accept the responsibility to encourage others to adhere to these standards.

Accommodations   The Disability Resource Center serves students with a wide array of learning challenges and disabilities. If you are a student who has a disability or learning challenge for which you have documentation or have seen someone for treatment and if you feel you may need accommodations in order to be successful in college, please contact DRC as soon as possible.

If you are a person who requires assistance in case of an emergency situation, such as a fire,

earthquake, etc, please meet with your individual instructors to develop a safety plan within the first week of the quarter.

The DRC office is located in B 132 or you can call at 425.564.2498. Deaf students can reach us by video phone at 425-440-2025 or by TTY at 425-564-4110.   Application information and other helpful links at www.bellevuecollege.edu/drc

Public Safety

The Bellevue College (BC) Public Safety provides personal safety, security, crime prevention, preliminary investigations, and other services to the campus community, 24 hours per day, 7 days per week. Their phone number is 425.564.2400. Public Safety is located in K100 and on the web at: http://bellevuecollege.edu/publicsafety/ for campus emergency preparedness information, campus closure announcements and critical information in the event of an emergency.

Participating in Business Learning Community

If you intend to and have not already done so, declare your business major. Make sure you have consulted with an advisor and laid out your courses. Consider joining the Business Leadership Club.

Social Science policies can be viewed at https://bellevuecollege.edu/socsci/policies.asp

Module	Knowledge DESCRIBE what the following are:	Comprehension IDENTIFY	Application USE	ANALYZE (hand, TI-83 and Excel)	CREATE (using Excel) TEAM PROJECT	EVALUATE
MODULE 1 Communicating Data Read 1.1, 1.2, 1.3, 1.4, 1.5. and 1.6 Read 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8	descriptive and inferential statistics sample, random qualitative and quantitative data continuous and discrete nominal, ordinal, interval and ratio data histogram, pie chart, scatter plot, simple linear regression, box plot and stem leaf mean, median, mode minimum, maximum, range, standard deviation (sum of squares) Percentile, z-score, outliers Skewness, kurtosis Summation	Classify data by qualitative, quantitative, continuous, discrete, nominal, ordinal, interval and ratio Identify mean, median and mode in a data set Identify minimum, maximum, range Describe what a histogram, pie chart, scatter plot, box plot and stem leaf shows. Describe what a linear regression is.	Calculate mean, median, mode, variance, min, max, range, standard deviation, percentile, or z-score for a data set of up to 25. Create a histogram, pie chart, scatter plot, or stem leaf with proper labeling from a data set of up to 25. Hand calculate simple linear regression including correlation and R square for a data set of up to 12.	Interpret mean, median, mode, variance, standard deviation, percentile, z-score relative to each other and what they mean for the population.	Select a set of more than 50 data. Generate descriptive statistics on Excel and interpret what it says about the data set. Organize visual display to effectively communicate what the data shows.	Compare and analyze various kinds of visual display of data. Compare and contrast measures of central tendency and variation and their implications to the data. Predict from visual display. Identify the limitations of data.
MODULE 2 Describing populations Read 4.1, 4.2, 4.3, 4.4 Read 5.1, 5.2, 5.3, 5.4	General discrete probability distributions. (Expected value or mean, standard deviation) Binomial probability distribution (mean and	Describe general discrete probability distribution. Give the formula for the mean/expected value and the standard deviation.	Create a general discrete table from data, plot the graph, calculate the mean and standard deviation. Create a binomial	Place mean and standard deviation on general discrete probability plot. Calculate binomial. Apply the empirical rule.	Create probability distributions. Construct normality plot. Calculate probability for various z-scores.	Compare discrete distributions. Evaluate normality.

	standard deviation). Trees (Bayesian). Normal probability distribution. Standard normal curve.	List the three conditions of a binomial distribution. Give the formula for binomial, mean, and standard deviation. Explain the empirical rule and how it relates to normal distributions.	table from data, plot the graph, calculate the mean and standard deviation. Identify normal probability distributions and do tests for normality. Calculate x and z and find probabilities using the z-table.		
MODULE 3 **Estimation** Read 6.1, 6.2, 6.3 7.1, 7.2, 7.3, 7.4, 7.5	Define central limit theorem, standard error, and sampling error. Define confidence level, alpha, and confidence intervals. Define margin of error. Explain what a t distribution is and when you use it.	Describe the central limit theorem and the relationship between the population and the sample means curve. Define standard error. Define confidence interval. Define sampling error.	Identify which should be used in large sample, small sample and large sample proportion. Apply t distribution and probability. Identify the margin of error. Describe the effect that sample size has on accuracy.	Calculate probability for the sample means curve. Calculate confidence intervals. Differentiate between t and z distributions. Calculate the sample size necessary for a margin of error.	Interpret confidence intervals. Evaluate whether two populations are the same.	Evaluate and interpret polls. Identify the limitations of polls. Evaluate the predictive quality of polls.
MODULE 4 and 5 **Hypothesis testing** Read 8.1, 8.2, 8.3, 8.4, 8.5. 9.1, 9.2, 9.3, 9.4, 9.5	Null hypothesis. Alternate hypothesis. Alpha. One-tail Two-tail One population Two population Critical t or z p-value	Define null. Define alternate. Type 1 and type 2 error. Setting alpha. Decision rule. Critical z or t.	Classify problem as large, small, proportion, pooled variance and unequal variance. Identify critical z or t.	Calculate test statistic. Find p-value.	Interpret test statistic. Evaluate p-value.	Analyze the cost of type 1 and type 2 error. Evaluate and improve on actual studies.
Analysis of	Null hypothesis	Define null.	Classify as one or	Calculate F-statistic.	Interpret test	Evaluate use of

Variance **More than two** **populations** **Read 10.1, 10.2,**	Alternate hypothesis Test statistic (F statistic	Define alternate. F-statistic.	two factor ANOVA. Checking ANOVA assumptions.	Find p-value.	statistic. Evaluate findings.	ANOVA and follow-on tests.
MODULE 6 **Multiple** **Regression** **Read 11.1, 11.2,** **11.3, 11.4, 11.5,** **11.6, 11.7, 11.8** **12.1, 12.2, 12.3,** **12.4**	Dependent variable. Independent variable. Intercept Slope Residual Correlation R square Prediction Prediction interval Confidence interval Assumptions (mean equal 0, variance equal, variance constant, normal) Outlier removal	Identify, define and discuss intercept, slope, residual, correlation, r-square.	Identify if regression is appropriate for the data. Describe the relationship between x and y.	Calculate intercept, slope, correlation, Rsquare, prediction, prediction interval, confidence interval.	Interpret results.	Evaluate if data transformation is necessary. Provide predictions from the analysis.
Chi-square **Read 13.2, 13.3,** **13.4**	Contingency table Null hypothesis Alternate hypothesis Test statistic Observed frequency Expected frequency	Identify null and alternate		Calculate expected frequency. Calculate chi- square.	Interpret results.	Evaluate the usefulness of test.

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LINKS TO RESOURCES	Power Point	Sample Excel Spreadsheets	VIDEO LECTURES	VIDEO PROBLEMS AND EXCEL DEMOS
Module 1 - Chapter 1, 2	Module 1	Car file data for Excel 1 Car file Demo Histogram Histogram/Normality	Module 1 Part 2 Communicating Data Module 1 Part 3 Graphs Module 1 Part 4 Central Tendency/Variability Module 1 Part 5 Linear Regression	Mean Median Mode Stem Leaf Problem 2.37 Excel Histogram Excel Central Tendency and Variability Excel Simple Linear Regression
Module 2 - Chapter 3, 4, 5	Module 2	z and t table Noncumulative Binomial Table	Module 2 Part 1 Probability Module 2 Part 2 General Discrete Module 2 Part 3 Binomial Module 2 part 4 Normal	General Discrete Problem 4.11 Mean and Standard Deviation Binomial Problem 4.115 Normal Distribution 5.37 Excel Normality Plot
Module 3 - Chapter 6, 7	Module 3	7.22 7.40	Module 3 Part 1 Central Limit Theorem Module 3 Part 2 Confidence Interval	Large Sample Means Confidence Interval Problem 7.22 Small sample means Confidence Interval Problem 7.40 Large sample proportion Confidence Interval Problem 7.48 Excel Random Sampling Excel Confidence Interval
Module 4 - Chapter 8 Module 5 - Chapter 9, 10	Module 4 Module 5	9.122	Module 4 Part 1 One sample hypothesis testing Module 5 Part 2 Two sample hypothesis testing Module 5 Part 3 ANOVA	One pop. large sample Problem 8.34 One pop. small sample Problem 8.61 One pop. proportion Problem 8.79 Two pop. pooled variance Problem 9.19 Two pop. proportion Problem 9.61 Two pop. paired Problem 9.122 ANOVA Problem 10.33
Module 6- Chapter 11, 12, 13	Module 6	Prediction Interval Chi Square	Module 5 Part 1 Multiple Regression Module 5 Part 2 Simple Chi Square Module 5 Part 3 Chi Square	Excel Demo for PROJECT Website: http://ba240.groups.live.com Login: ba240student@live.com Password: 2013Winter No spaces "W" is capitalized. Once you signed in, click on documents.