

STT 315

Lectures 1 and 2, all sections Spring Semester 1998

(Draft 1-14-98, subject to change)

Course Administration: The course is given in lecture-recitation format.

Lecture 1, ODD SECTIONS : M+W, 12:40-2:00 p.m, 158 NR.

Lecture 2, EVEN SECTIONS : M+W, 3:00-4:20 p.m, 158 NR.

Each student must enroll in a THURSDAY recitation section and attend it regularly.
All unit quizzes are administered in recitations as are some other graded activities.

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Help Room C100 Wells Hall: There will be a TA or Help Room Assistant in C100 during the week (hours of operation to be announced). Every TA meets one office hour per recitation per week.

Televised Summaries: A 50 minute TV lecture summarizing essentials of the lectures and focusing on the recitations will be recorded at 8:00 a.m. on Thursday of each week for live broadcast and re-broadcast at the following times:

All are shown on **Campus Channel 5 (any TV equipped classroom)**, or

Thursdays 8 a.m., 5 p.m., 6 p.m., on **TCI 28**, and **Media One 98**

Saturdays 8 a.m., Sunday 10 a.m., on **TCI 27**, and **Media One 38**

Tapes will be on **reserve in the main library** and will be re-broadcast sequentially in marathon sessions Saturday and Sunday before the all mid-terms and the final.

Text/Course Pack. The required text is Complete Business Statistics, 3rd Ed., by Amir Aczel, Irwin Publ. Course pack **STT 315, Dr. Raoul LePage, Spring Semester 1998** will be available from Paper Image on 2-16-98. Please see "**Website**" below.

Website. Our course website is reached through <http://www.stt.msu.edu/~rdl/> where you click on STT 315 Spring 1998. You can view and download the current version of this syllabus, and other course information.

Grading Scale. Every project, quiz or exam you submit will be **graded** in the 4.0 scale. All quizzes count equally and all projects count equally. Your grade-lowest two projects will be dropped as will your grade-lowest quiz. The remaining **grades** will be combined into a single course grade according to the following weights:

project average = 15%

quiz average = 30%

pre mid-term = 8%

.85 mid-term + .15 post mid-term = 19%

pre-final exam = 10%

final exam = 18%

Please note: *Negative* grades can be earned for really sub-standard performance. Do not assume that you can skip an exam and preserve your average. This is particularly the case for the in-class mid-term exam, and the in-class final exam, where outstandingly bad performance will seriously lower your course average!

At the end of the course we "split the difference" so a course grade of 3.24xxx goes as 3.0 while one of 3.25xxx goes as 3.5. There are no make-up exams/quizzes/projects.

In *rare emergencies* points may **with prior approval** of Dr. LePage be shifted from one exam to another. Submit a request directly to Dr. LePage, in writing, with your reasons (e-mail preferred).

Originality. Unless we advise you to the contrary, outside work which you submit under your own name is regarded as being accomplished on your own, just as if it were an in-class examination. If you have any concerns about serious departures from this policy by anyone taking this course please communicate your concerns to Dr. LePage directly, in writing (e-mail preferred). **In-class exams are closed book.** They have provisions to catch and provide solid evidence of cheating. If it occurs we will invoke university procedures.

Pilot. Please check your Pilot account every Thursday or Friday. You may receive messages from Dr. LePage concerning the course.

Course Overview. This is a first course in Probability and Statistics for business majors. The prerequisite for the course is Math 120 or 124 or 132. The course is organized into weekly units. In recitation there is a graded quiz nearly every other week covering primarily the material since the previous quiz. The other weeks there is a graded project. The **mid-terms** (after Spring break and later than the middle of the semester) have three parts: (1) take-home pre-exam, (2) full period in-lecture closed book mid-term, (3) a fresh exam, given out as you leave the mid-term, to be taken home and submitted IN FULL as a take-home exam. The **pre-final exam** is also a take-home exam.

Course Calendar. Subscripts below indicate the units covered each lecture.

Lecture Lecture Recitation

January

	14 ₁	15 _{project in class}
19 ₁	21 ₁	22 _{project due}
26 ₂	28 ₂	29 _{quiz}

February

2 ₃	4 ₃	5 _{project due}
9 ₄	11 ₄	12 _{quiz}
16 ₅	18 ₅	19 _{project due}
23 ₆	25 ₆	26 _{quiz}

Lecture Lecture Recitation

March

2 ₇	4 ₇	5 _{project due}
16 _{review}	18 _{rev, pre-midterm out}	19 _{review}
23 _{review, pre mid back}	25 _{in-class mid term}	26 _{post-mid back}
30 ₈		

April

	1 ₈	2 _{quiz}
6 ₉	8 ₉	9 _{project}
13 ₁₀	15 ₁₀	16 _{quiz}
20 ₁₁	22 ₁₁	23 _{project}
27 _{pre-final out, review}	29 _{pre-final back, review}	30 _{review}

May

4_{EVEN SECTIONS, final exam, Monday, 3:00-5:00 p.m.}

5_{ODD SECTIONS, final exam, Tuesday, 12:45-2:45 p.m.}

Topics Emphases. Below, we list important topics *by unit*. If a topic does not appear below you can safely ignore it for quizzes and exams although it may be mentioned in lectures or recitations for completeness (permutations/combinations are re-assigned to later readings and exams as indicated). Everything mentioned will likely be on quizzes and exams. An asterisk indicates a supplement given in lecture. Additional Problems may be assigned in class.

Unit 1. Descriptive statistics, mean, variance, standard deviation, computer use

Section	Problems
1-2	1-13 to 1-17 odd
1-3	1-18 to 1-25 odd
1-4	1-26 to 1-33 odd
1-5	Make frequency histograms and relative frequency histograms for the data of each of 1-13 to 1-17 (odd) using class interval 3 and class marker 0 (i.e. bins ... $[0,3]$, $[3,6]$... etc.). For data on the boundary of two intervals, count it in the lower interval (so e.g. data 3 is counted in $[0,3]$ and not in $[3,6]$). *Calculate the mean and sd of grouped data from each of 1-13 to 1-17 odd after grouping into .. $[0,3]$, $[3,6]$, Consult Handout A (given out in lecture) if you choose to use the computer.

Unit 2. Union, intersection, complement, Basic probability, addition rule, trees

Section	Problems
2-2	2-1 to 2-12 odd (amend 2-11 "or a particular one of your ..")
2-3	2-13 to 2-27 odd
2-4	2-28 to 2-35 odd *Tree diagrams for all.

Unit 3. Conditional probability, multiplication rule, trees, independence, Bayes

Section	Problems
2-5	2-36 to 2-49 odd
2-7	2-60 to 2-69 odd *Tree diagrams for all.

Unit 4. Random variables, expectations, variances, standard deviations

Section	Problems
3-1	3-1 to 3-9 odd
3-2	3-10 to 3-28 odd

Unit 5. Binomial, Poisson, and hypergeometric distributions

Section	Problems
3-3	3-29 to 3-40 odd
3-4	3-41 to 3-47 odd Omit the geometric distribution.

Unit 6. Acceptance sampling from Handout B of the course pack

Problems from Handout B of the course pack.

Unit 7. Normal distribution, backward and forward table use

Section	Problems
4-3	4-1 to 4-21 odd
4-4	4-22 to 4-32 odd
4-5	4-33 to 4-45 odd

Unit 8. Sampling distributions, central limit theorem

Section	Problems
5-2	5-1 to 5-10 odd
5-3	5-11 to 5-26 odd

Unit 9. Quality control from Handout C of the course pack

Problems from Handout C of the course pack.

Unit 10. Confidence intervals

Section	Problems
6-2	6-1 to 6-17 odd
6-3	6-18 to 6-27 odd
6-4	6-39 to 6-45 odd

Unit 11. Testing hypotheses

Section	Problems
7-2	
7-3	7-1 to 7-6 odd
7-4	
7-5	

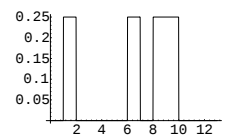
Mathematica. (OPTIONAL) To assist you (at your option), we provide you the option of using our prepared "electronic notebooks" which can perform many of the calculations needed for homework and projects which require you to perform statistical analyses. You may also choose to use these "electronic notebooks" to **check your**

answers on homework assignments and provide answers to other problems you make up for yourself. We do this in *Mathematica* which is a computer software package developed for getting a computer to perform mathematical operations in general. Using *Mathematica* we have written simplified "commands" to carry out most of the calculations and plots that you will study. Here are a few illustrations:

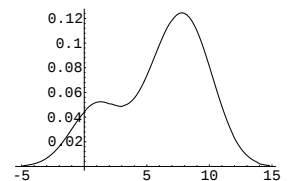
<u>notebook command</u>	<u>what is then done by <i>Mathematica</i></u>	<u>the result</u>
costs = {1,6,9,8}	defines a list "costs" to consist of 1,6,9,8	{1,6,9,8}
mean[{1,6,9,8}]	$(1+6+9+8)/4$	6
mean[costs]	$(1+6+9+8)/4$	6
s[costs]	$\sqrt{(((1-6)^2+(6-6)^2+(9-6)^2+(8-6)^2)/(4-1))} = \sqrt{[(25+0+9+4)/3]}$	3.55903

histogram[costs,2,1]* histogram of "costs" with origin 2, classwidth 1

(* histogram is not implemented on the computer)



smooth[costs,2] smoothed density of "costs" with "bandwidth" 2



See Chapter 1 for definitions of the mean, sample variance, and histogram. Smoothed densities will be described in the lecture.

Starting a *Mathematica* unit from a Windows 95 equipped computer: See Handout A, given in lecture.