YEAR COURSE OFFERED:  2016

SEMESTER COURSE OFFERED:  SUMMER 2ND 6 WEEKS

DEPARTMENT:  MATHEMATICS

COURSE NUMBER:  MATH 3339

NAME OF COURSE:  STATISTICS FOR THE SCIENCES

NAME OF INSTRUCTOR:  EMANUEL I. PAPADAKIS

The information contained in this class syllabus is subject to change without notice. Students are expected to be aware of any additional course policies presented by the instructor during the course.

Prerequisites: Math 1431: Calculus I


This section uses face to face and supplementary online instruction. Office hours will be announced via Blackboard. My office number is 681 and is located in PGH.

Class days: Monday-Thursday. Fridays are only for exams or for a workshop except for the first Friday of classes. We will also have workshops during the week

Description of course delivery style

The textbook is primarily designed to teach statistical methods and certain concept of probability without the overload of calculus technicalities. Unlike other books it enables the instructor and the students to begin using data from day one and have a faster access to statistical methods than in more classical delivers of the same course where probability comes first but the data analysis has to wait until the very end of the course. Although you will encounter less calculus technicalities compared to past years, the rigor and objectives of the course remain the same with all other sections of 3339, but to address the needs of the current student population the style will be different using a lot of examples from biology and medicine. To modernize the course and to conform with other sections the use of R now becomes mandatory. R is a free statistical software. You can download and install R and R Studio. The latter is a useful cell quite reminiscent of Matlab that makes the use of our and the installation of new packages easier than R itself.

The following table is only an outline of the course and it only provides a list of the topics we will cover.
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Topics we will cover

Displaying and Describing data
Uncertainty in inferences
Basic Concepts of probability and hypothesis testing
Analyzing proportions, Discrete and continuous Random variables, Bernoulli and Binomial Distributions
Goodness of fit.
The normal distribution.
The Central Limit Theorem
Inferences for a normal population, or for a population with a not necessarily normal distribution.
Comparison of two means and two proportions (Chapter 13 will be omitted)
Linear regression
We may cover simple ANOVA.

Grading policies

In this course we have three exams, one every two week always on Fridays. Exams, (E1), (E2) and (E3) of 70 points each, for a total of 210 marks approximately. Below H stands for the total homework points and B for the total bonus points (see bonus policy). There will be three homework assignments which you turn in on Thursdays. Total stands for the maximum cumulative number of points a student can make in this course, excluding bonus points.

Homework assignments do not always worth the same number of points. You must work on ALL problems in a homework assignment even if you can’t solve all problems. Attempting a problem automatically makes you eligible for some partial credit for this problem. Problems suggested for home study are not necessarily the homework problems. Once you submit a homework, you are assumed to be able to explain your solution to me on the board if I ask you to do so. Failure to demonstrate that you have an adequate understanding of your homework solution(s) will void the entire homework. Justifications are very important and account for half of your points in a homework or exam problem.

Final grade at this point is \( \frac{100(H+E_1 + E_2+E_3+B)}{\text{Total}} \) and you can see this grade under the tag "Grade before final Exam" as well as all other grades in Blackboard. Grades are updated as the course progresses. Homework total is set to 84; each homework assignment gives 42 points.

The final exam is optional. If a student chooses to take the final then the following grade calculation scheme applies: The grade of the final exam, is denoted by F and is out of 200 marks. The goal of the final exam is to give a chance to eliminate low grades. However, this requires adequate preparation because this exam is longer and comprehensible in contrast to Exams 1 and 2 which are sectional. \( \text{The final exam replaces grades, so you may wish to attempt it only: If you don’t submit your final exam paper for grading then your grade as formed with all exams and} \)
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homework prior to the final exam becomes your final grade in this course. EXAMS 1, 2, 3 ARE SECTIONAL BUT THE FINAL EXAM IS COMPREHENSIBLE. During exams you can have a formula kit of your own making.

Recall that the final exam replaces grades, so once you submit the final exam, grade replacement is immediately effective on the grades you intent to replace. This implies that these grades are replaced with your scores from the final exam and there is no way of rolling back to the original grades. Below you see the schedule for grade replacements. Of course, you may attempt the final, you may decide that it is better to not submit the exam, then you walk away with your exam in hand, and your overall grade before the final exam becomes your final grade in the course. On the front cover of the blue notebook INDICATE which grade(s) you wish to replace and which problems of the final exam you want us to grade in order to replace the grade(s). Don't solve more then what you need. If you score 185 or more points then your course grade is automatically set to A.

Final grade calculation algorithm:
Set $100(Q + H + M1 + M2 + M3 + B)/[Total] = Tavg$. The final replaces up to 200 points but not bonus points. Typically, your final exam points will be used to replace the lowest two of your grades.

**Bonus policy:** Bonus marks are added to your grades. There is no bonus for homework.

1. If you score in any 2 of the 3 exams any score over 52, or 50, then you receive a 8% bonus on each one of these exams.

2. If you improve your grade in the sequence of the 3 exams then you receive a 20% bonus on the improvement.

3. If each homework is over 32 points then you receive 10 bonus points.

4. If the grade of homework 2 exceeds the grade of homework 1 by 7 points and both homework grades are over 20 points then you receive 6 bonus points.

5. However, if the grade of homework 2 is 40 or more, then regardless of the grade of homework 1, you receive 4 bonus points.

   Bonus is not awarded for grade replacements with the final exam.

**Grading scale:** <46 is F, >=46 is D-, >=51 is D, >=61 is C, >=71 is B-, >=76 is B, >=90 is A.

This scale is only indicative. I use all + and all letter grades.