January 2019
Syllabus

Probability and Statistics for Engineers and Scientists

Mon – Fri
8:30 – 3:30

Course Instructor

Welcome to STAT4340 / CSE4340 / EMIS 3340. I am Dr. **Cornelis Potgieter**, a faculty member in the Department of Statistical Science at SMU. Office hours for this class are by appointment. I will try to have availability most events before/after dinner.

Resources and Learning Aids

Textbook: There is *no required textbook* for this class. Comprehensive notes detailing the material covered will be posted to Canvas following each class. If you are looking for additional reading on any topic, the following texts are recommended:

1. *Applied Statistics and Probability for Engineers, 6th Edition, by Douglas Montgomery & George Runger.*
2. *Probability & Statistics for Engineering and the Sciences, 9th Edition, by Jay Devore.*

Lectures are very important for understanding the material and doing well on the exams, so please attend. Your participation via questions, answers and comments is encouraged. Do not neglect homework assignments, as these will assist in you mastering the material.

Attendance is required. Failure to attend regularly will put your success in the course (and your grade) in serious jeopardy. In-class handouts will *not* be posted online or distributed electronically. If you miss a specific handout, please stop by after class or during office hours to pick up a copy.

source: https://xkcd.com/539/
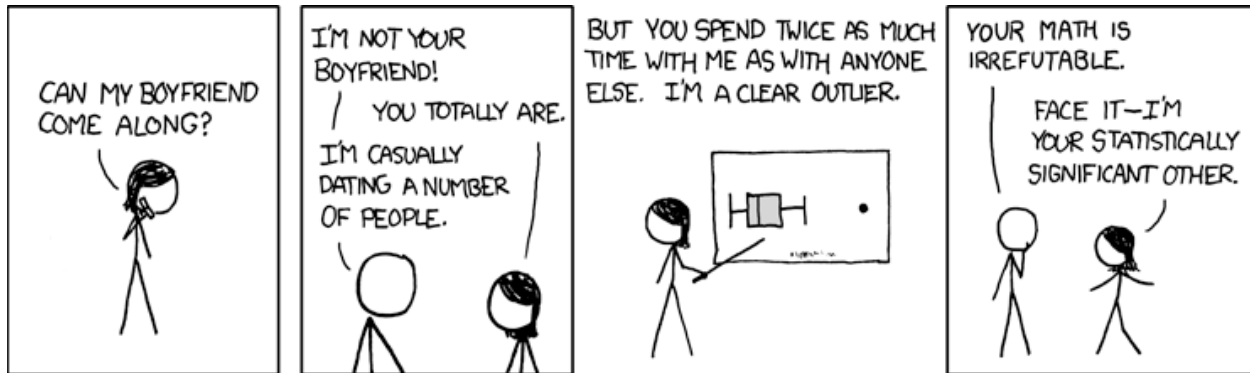
Course Description and Learning Objectives

By the end of the semester, you should have a solid foundation and understanding of basic statistical concepts as they pertain to various areas of engineering, computer science, and experimental (applied) sciences in general. This class will introduce various techniques to analyze statistical data. Additionally, this class will present the necessary statistical theory to give you a foundational understanding of the concepts presented. These skills should aid you in becoming an informed and critical consumer of scientific literature, as well as help in your development in your own scientific endeavors.

Foundational Concepts (60% of the class)	Statistical Applications (40% of the class)
- Module 1: Probability. - Module 2: Univariate Probability Distributions. - Module 3: Joint Probability Distributions.	- Module 4: Statistical Estimation. - Module 5: Simple Tests of Hypotheses.

More specifically, after successful completion of the course, you should be able to:

1. Define and determine sample spaces. Calculate probabilities of various events.
2. Understand statistical independence and conditional probabilities.
3. Recognize several well-known discrete and continuous probability models and calculate corresponding probabilities.
4. Extend concepts to joint probability distributions and calculate correlation and covariance.
5. Understand sampling distributions of statistics.
6. Understand the Central Limit Theorem.
7. Calculate and interpret descriptive statistics from various populations.
8. Learn methodology of point estimation.
9. Calculate and interpret confidence intervals.
10. Conduct hypothesis tests and interpret results.

Note that both MATH 1337 and MATH 1338 (Calculus I and II) are **prerequisites** for this class.

Assessment and Grading Policy

Grading: Your semester grade will be determined as follows:

Two Exams	*40%*
Homework Assignments	*30%*
Quizzes	*30%*

Grading Scale: A final percentage of 90% will guarantee at least an A-. Furthermore, 80% guarantees at least a B-, 70% guarantees at least a C-, and 60% guarantees at least a D-. Letter grade increments are 3.33%.

Exams:

Each of the two exams will focus on about half of the material covered in class.

You may make a note card (4x6 index card, front and back) for each exam. Note cards may consist of any definitions, theorems and formulas, but *no worked examples* are allowed on the note card.

Calculator: Make sure you have a calculator that can perform operations with the Normal, Binomial, and Poisson distributions. The **TI-83** is a good fit for this class and corresponds to what I use. If you have a different calculator and want to check with me whether it meets the necessary requirements, feel free to stop by during office hours.

Quizzes: There will be a daily quiz covering the material from the previous day of class. There will be *no make-up quizzes* given if you are absent from class when this happens. The lowest quiz grade will be dropped at the end of the semester.

Homework Assignments: There will be daily homework assignments in this class. Assignments are due at the start of class. Write as clearly as possible. Half the homework grade will be for completeness of your work, while the other half of the grade will be for correctness. Please remember to staple multiple pages together!

Group work is encouraged, but each student should write up his/her own assignment. I am available during office hours to answer any (reasonable) questions you may have about the homework. N**o late homework assignments will be accepted**. The lowest homework grade will be dropped at the end of the semester.

Getting Help: Please contact me if you have questions or are having difficulties. Office hours are regularly scheduled times that you can come by to ask questions or get help.

Other Important Information

Disability Accommodations: Students needing academic accommodations for a disability must first register with Disability Accommodations & Success Strategies (DASS). Students can call 214-768-1470 or visit http://www.smu.edu/Provost/ALEC/DASS to begin the process. Once registered, students should then schedule an appointment with the professor as early in the semester as possible, present a DASS Accommodation Letter, and make appropriate arrangements. Please note that accommodations are not retroactive and require advance notice to implement.

Religious Observance: Religiously observant students wishing to be absent on holidays that require missing class should notify their professors in writing at the beginning of the semester, and should discuss with them, in advance, acceptable ways of making up any work missed because of the absence. (See University Policy No. 1.9.)

Excused Absences for University Extracurricular Activities: Students participating in an officially sanctioned, scheduled University extracurricular activity should be given the opportunity to make up class assignments or other graded assignments missed as a result of their participation. It is the responsibility of the student to make arrangements with the instructor prior to any missed scheduled examination or other missed assignment for making up the work. (University Undergraduate Catalogue)

SMU Honor Code: The SMU Honor Code will be strictly enforced. Students caught giving or receiving unauthorized help on examinations will either be given a course grade of zero or taken before the Honor Council.