

ISYE 3770 Statistics and Applications

Catalog Description - Introduction to probability, probability distributions, point estimation, confidence intervals, hypothesis testing, linear regression, and analysis of variance. Cross-listed with CEE 3770.

Prerequisites - MATH 2401 or 2411 or 24X1 or MATH 2605 or equivalent.

Textbook - D.C. Montgomery and G.C. Runger, Applied Statistics and Probability for Engineers, 6th Edition, 2014, John Wiley and Sons.

Objective - Provide an introduction to probability and statistics, emphasizing applications in science and engineering.

Instructors - Dr. Rontani. Office TBD – GTL Building. e-mail: damien.rontani@centralesupelec.fr. When you email me, please start the subject of the email with [ISyE 3770]. Failure to place this in the subject line could cause your email not to be read.

Lectures – Schedule TBD. Any unexpected change of schedule will be announced in a timely manner; new time and location will be provided to the students. Due to the highly constrained schedule on the GTL campus, if a class needs to be rescheduled it will be at a time that allows all student to attend.

Attendance - Attendance is worth 2%. Attendance will be checked to count the number of absences. Students who do not miss more than 2 lectures during the entire term get 2% for attendance. Students who miss more than 2 classes, for any reason, get 0% for attendance. Attendance sheets will be used to count the number of absences at the beginning of class.

Office hours - TBD – GTL Building (schedule can be changed to accommodate student the best). Any unexpected change of schedule will be announced in a timely manner; new time and location will be provided to the students. If you cannot attend the Office hours, do not hesitate to send me your questions by email at damien.rontani@centralesupelec.fr.

Grading Policy

HOMEWORK	18%
QUIZZ 1 (1 hour 30 min)	22.5%
QUIZZ 2 (1 hour 30 min)	22.5%
FINAL EXAM (3 hours)	35%
ATTENDANCE	2 %

Important Dates (tentative dates)

QUIZ 1	TBA
QUIZ 2	TBA
FINAL EXAM	TBA

Quizzes and Exams - The quizzes and the final examination will be closed book and notes but in some cases formula sheets can be provided. The use of a laptop, cell-phone, or any smart device with Internet/WIFI connectivity is not authorized during quizzes and exams. It is not permitted to student to collaborate or share information during quizzes and exam: these are individual assignments. The use of a calculator will be allowed.

Quizzes and exam grading policy: Any request regarding a quiz or exam must be made within one or two weeks of getting the quiz/exam back. There will be no make-up quizzes for any reason. If you have an acceptable reason (for e.g. illness with doctor statement of your inability to take the quiz) for missing a quiz, the weight associated to the quiz will be transferred to the Final Exam.

Homework - Problems will be assigned approximately once every week or 2 weeks from Wednesday to Wednesday. Student collaboration is authorized and encouraged, but a submitted homework must be worked out and written up on your own. Indicate on your copy whether or not you have collaborated with other students during the preparation of your homework, and if so, then indicate their names.

Homework should be submitted electronically on Canvas as a single pdf file. Please write your name and box all answers. Procedure for turning in late homework: late homework should also be submitted electronically on Canvas. If Canvas happens not to accept a late submission, email your homework directly to me (damien.rontani@centralesupelec.fr). Please start the subject of the email with [ISyE 3770]: Failure to place this in the subject line could cause your email not to be read. Homework can also contain computer-based problems using software available to GT student such as Matlab or Python, so that students can develop more practice with the notions taught in class.

Homework grading policy: If your name is absent, you lose 10% on the homework. Homework turned in after the deadline loses 50%. Homework turned in two or more days late will not earn credit. The submission time on Canvas will be used to determine whether homework is submitted on time or not: no exceptions will be made. Copying solutions from a Faculty Solutions Manual is cheating. The homework will be graded on a completion mark basis and element of solution to the Homework will be provided.

An assignment might be due on the final instructional class days and might be based on material covered during the week before the Final Exam.

Tentative Topical Outline

Topics	Weeks (approx.)
Probability Introduction	1
Random Variables	1
Discrete Distributions	1
Continuous Distributions (including Normal)	1
Descriptive Statistics	1
Sampling Distributions	1
Point Estimation	1
Confidence Intervals	2
Hypothesis Testing	2
Categorical Data Analysis	1
Analysis of Variance, Experimental Design	1
Simple Linear Regression	1.5
Multiple Linear Regression	0.5

Outcomes and their relationships to ISyE Program Outcomes - (i) Ability to collect, organize, summarize and present data graphically. (ii) Demonstrate ability to use formal mathematical argument with basic probability concepts, including conditional probability distributions. (iii) Understand how to characterize and assess probability in its role in experiments. (iv) Use statistical tests and confidence intervals to assess mathematical uncertainty in statistical decisions. (v) Select proper statistical techniques for statistical decision-making based on the type of data available. (vi) Use statistical software / toolboxes to conduct data analyses and interpret output. (vii) Draw sound statistical conclusions from experiments and observational studies.

Student-Faculty Expectations Agreement - At Georgia Tech we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. See <http://www.catalog.gatech.edu/rules/22/> for an articulation of some basic expectation that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.

Honor Code - Students are, of course, expected to abide by the [Georgia Tech Honor Code](#). Instances of academic misconduct will be viewed very seriously and reported to the Office of Students Integrity. There will be a zero-tolerance policy when it comes to cheating.