

ISyE 3030 – Basic Statistical Methods

1. Class Time and Location: Tuesday and Thursday 1:30 pm – 3:25 pm at the GTE assigned classroom
2. **Instructor:** Dr. Jye-Chyi Lu (nickname: JC), Professor in ISyE; Taught this class in the GTE 10+ times;
Fellow of the American Statistical Association;
2022 CIOS Award Winner and Three Times CIOS Honor Roll
3. Email: JCLU@isye.gatech.edu (main communication method) – **Email me for questions**
4. **Pre-Requisites:** ISyE 2027; **It is encouraged that students in GT-E take ISyE 3030 and 4031 together.**
5. Office Hours: **9:45 – 10:15 am & 12:30 – 1:20 pm, T, Th** (at the office assigned by the GTE)
6. **Course Description** posted in GT Catalog: Point and interval estimation of systems parameters, statistical decision making about differences in system parameters, analysis and modeling of relationships between variables.
7. **Texts: I will use notes posted on Canvas.** The book below will serve as our main reference.
Applied Statistics and Probability for Engineers by Douglas C. Montgomery, George C. Runger, 7th Edition, 2019, John Wiley and Sons. ISBN-10: 1119585597; ISBN-13: 978-1119585596
8. **Course Goals/Contents:** The course will be instructed under the following three components.
 - 1) Regression, Variable Selection and Model Building,
 - 2) Design of Experiment, and ANOVA (Analysis-of-Variance)
 - 3) Basic Statistical Inference (Estimation and Hypothesis Testing)
9. **Software:** Free statistical software package R will be used. It can be downloaded at <http://cran.r-project.org/>
10. Grade Distribution: Exam #1(a) (20%), Exam #1(b) (12%), Exam #2 (15%), Exam #3(a) (20%) and Exam #3(b) (15%), Two Computer Projects (in place of the Final Exam) (11%), Two Enrichment Projects (4%), Attendance (2% - GTE requires attendance check for every lecture – students are allowed to miss up to **three** attendances), Instructional Survey (1%). Note that there are past reports and R-codes for take-home exams and computer projects.
11. Final Grades: We will use the following letter grade assignments: A for [90 and above) semester scores, B for [80, 89.999), C for [70, 79.999), D for [60, 69.999), and F for (59.999 or below).

Remarks: The following remarks are for students who take both ISyE 3030 and 4031 courses.

- [1] **Regression subjects**, lecture-notes, assignments, and exams for both ISyE 3030 and 4031 are the same.
- [2] For students, who take both ISyE 3030 and 4031, can take **regression exams** from one course and count them for two courses.

12. Georgia Tech Honor Codes: Students are required to follow the Georgia tech honor code which may be found at: <http://osi.gatech.edu/content/honor-code>

Please pay attention to the following guidelines provided by Georgia Tech.

- 1) What is not plagiarism? *Plagiarizing is defined by Webster's as “to steal and pass off (the ideas or words of another) as one's own: use (another's production) without crediting the source.” If caught plagiarizing, you will be dealt with according to the GT Academic Honor Code.*
- 2) What is authorized collaboration and what is unauthorized collaboration? Regardless whether an exam is an in-class or take-home exam, **solving exam problems together is an unauthorized collaboration**. If an exam is a take-home exam and it is required to write computer codes to employ software packages to perform certain computation or data analysis, the following are **authorized collaboration** with fellow students:
 - (a) installing software systems onto your PC,
 - (b) downloading data into software systems,
 - (c) calling codes into your PC's software systems, and
 - (d) getting computer printouts from computer screens or downloadable files,

All other activities such as discussion of how to solve a problem, which software function to use, how to write codes or find sample codes to do computation or analyze data, and discussion of how to write solution reports to interpret computer printouts are unauthorized collaborations.

“For any questions involving these or any other Academic Honor Code issues, please consult me, or www.honor.gatech.edu.”

13. **Course Learning outcomes** and their relationships to ISyE Program Outcomes:

- Ability to collect, organize, summarize and present data graphically
- Understand how to characterize and assess probability in its role in experiments
- Use statistical tests and confidence intervals to assess mathematical uncertainty in statistical decisions
- Select proper statistical techniques for statistical decision making based on the type of data available
- Use statistical software to conduct data analyses and interpret output
- Draw sound statistical conclusions from experiments and observational studies

Course outcome \ Program Outcomes	a. apply math	b. Design, conduct experiment, analyze interpret data	c. Design system	d. team	e. problem solving	f. prof/ and ethical responsibilities	g. communication	h. global, eco, envi and soc context	i. Life-long learning	j. Contemporary issues	k. use tools for eng. practice
Ability to collect, organize ...		High									Med
Demonstrate ability to use formal...	High				High						
Understand how to characterize ...	High				High						
Use statistical tests...		High			High	Med	Med				High
Select proper statistical...			Med		High	High		High			High
Use statistical software		High									High
Draw sound statistical conclusions ...					High	High		High			

- Team project are sometimes conducted