

ISYE 6413 A/MSA, ISYE 4803 Design and Analysis of Experiments Fall 2026

Instructor : Prof. Roshan V. Joseph
Time/Location : Tu and Th 9:30-10:45 am in TBA.
Office : TBA
Email : roshan@gatech.edu
Phone : TBA
Office Hours : TBA
TA : TBA

Prerequisite: An introductory course in Statistics.

Textbook: C. F. J. Wu and M. S. Hamada (2021) *Experiments: Planning, Analysis, and Optimization*, 3rd Edition, Wiley.

Reference: V. R. Joseph (2026). *Experimental Design for Data Science and Engineering*, Chapman & Hall/CRC Press, <https://doi.org/10.1201/9781003661535>.

Software: R; We will use RStudio.

Course Outline: Selected topics from

1. Basic concepts and experiments with a single factor (Ch 1-2)
 2. Experiments with more than one factor (Ch 3)
 3. Full factorial experiments at two levels (Ch 4)
 4. Fractional factorial experiments at two levels (Ch 5)
 5. Full factorial and fractional factorial experiments at three levels (Ch 6)
 6. Screening designs and Nonregular designs (Ch 7-8)
 7. Response surface methodology (Ch 10)
 8. Robust parameter design (Ch 11)
 9. Computer experiments (Ch 14 and Ch 2 & 4 from Reference book).
 10. Experimental design for data science (Ch 10-11 from Reference book).
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Grading:

Homework	: 30%
Midterm Exam	: 20%
Project	: 20%
Final Exam	: 30%

Students in ISYE 4803 will receive extra 10% points on the midterm and final exams. The final grades will be based on the scale 85-100: A | 70-85: B | 55-70: C | 40-55: D | 0-40: F.

Homework: You can expect weekly or bi-weekly assignments. The solutions need to be submitted through canvas. Late HWs will not be accepted. In case of emergency, please contact the professor promptly via email.

Exams: Both the midterm and final can be computer-based exams.

Project: This will be team project. A team will contain two students. Each team is expected to identify a real-life problem, use experimental design techniques, and present the solutions. A project report (≤ 7 pages+Appendix) and a presentation (≤ 10 slides) during the final week are needed, which could be in the reading period.

Excused Absences from Exams or Assignments:

For getting excused absences from exams or homework, please get approval from the Dean's office: <https://studentlife.gatech.edu/>. Please inform the instructor of your approved absences timely. If the notification from Dean's office is for instructor's discretion and your absence prevents you from completing assignments or tests, please discuss the accommodations with the instructor as soon as possible. Since it is difficult to create a different but fair test, and solutions to assignments may have already been published, the accommodation might not be a makeup test or assignment.

Communications:

The important media for class materials communications are in class communications, Zoom meetings, Canvas, Ed Discussion, emails, and office hours. Emails are good for issues specific for an individual. If you have general questions about homework or lectures, please post your questions to Ed Discussion so that everyone can see and respond. You can also email me to setup an appointment. Please also pay attention to announcements posted in canvas or sent by email.

Expectations and Academic Integrity:

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. Please observe what I expect of you and what you expect of me listed in the Student-Faculty Expectations developed jointly by the SGA and faculty: <http://www.catalog.gatech.edu/rules/22/>

Academic integrity is very important. Please see <http://policylibrary.gatech.edu/student-affairs/academic-honor-code>. In this course, you are allowed to work together in the homework, as long as you write up and turn in your own solutions including the computer codes/outputs. The use of ChatGPT, Copilot, and other AI tools for solving problems in the exams is considered a serious violation.

Accommodations for Students with Disabilities:

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services at (404)894-2563 or <http://disabilityservices.gatech.edu/>, as soon as possible, to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible to set up a time to discuss your learning needs.