

EAS2655 Quantitative Techniques for EAS

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3 Credits: 3 lecture hours per week

Course description: Integrated course in mathematical, physical, and computing techniques for application in Earth and Atmospheric Sciences. The objective of this course is to master practical application of basic statistics and differential equations as a set of tools to investigate Earth Science problems.

Time: MWF 10:10-11:00AM

Location: ES&T L1175

No textbook

Prerequisites: Calculus, Linear Algebra and Differential equations.

Evaluation: [40%] homework (8 best scores from 10 assignments); [20%] midterm(*); [30%] final exam(**); [10%] attendance(***) and participation. All homework should be submitted as PDF document sent to filippos.tagklis@eas.gatech.edu. Late homework is accepted with 10% penalty per day. Delay with reasonable causes (including but not limited to job interviews, conferences, field work, medical appointments, sickness) are not penalized.

*Closed book, 45 min exam. One-page, double-side summary sheet is allowed. Midterm covers Week 1 through 8.

**Closed book, 90 min exam. One-page, double-side summary sheet is allowed. Final exam is cumulative; it covers the entire course material.

***Absences for acceptable causes (attending job interviews, conferences, field work, medical appointments, etc) are not penalized.

Attendance: We will have in-class exercises so attendance is important. I strongly encourage you to bring a laptop computer that can run MATLAB or Octave.

Grading: I encourage cooperation including sharing of knowledge & computer codes, and collaboration among the students. The write-ups and reports must be entirely your own work (i.e. copying another student's work in parts or whole is not permitted). Your final grade will be assigned as a letter grade according to the following scale:

A	90-100%
B	80-89%
C	70-79%
D	60-69%
F	0-59%

Tentative schedule:

Part I: Statistics & Data Analysis

Week 1: 1/7, 9, 11	Sampling and distribution
Week 2: 1/14, 16, 18	Data visualization
Week 3: 1/21 , 23, 25	Hypothesis testing
Week 4: 1/28, 1/30, 2/1	Regression and Correlation
Week 5: 2/4, 6, 8	Significance test
Week 6: 2/11, 13, 15	Correlation maps
Week 7: 2/18, 20 , 22	Multiple Linear Regression
Week 8: 2/25, 2/27, 3/1	Review and Midterm Exam

HW/project dues

HW1 due
HW2 due
HW3 due
HW4 due
HW5 due
HW6 due
Midterm exam

Part II: Differential Equations & Modeling

Week 9: 3/4, 6, 8	ODE
Week 10: 3/11, 13, 15	Box model
Week 11: 3/18 , 20 , 22	Spring break
Week 12: 3/25 , 27, 29	PDE
Week 13: 4/1, 3 , 5	Wave equation
Week 14: 4/8, 10, 12	Wave/heat equation
Week 15: 4/15, 17, 19	Heat equation
Week 16: 4/22	Pre-final review

HW7 due

HW8 due

HW9 due

HW10 due

April 26th (Fri)

Final exam (9:20AM-10:50AM) covers all of the material

Red dates indicate no class due to holidays or the instructor being out of town. **Bold with underline** indicates some form of due dates or **exam** dates.

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 in order to set up a time to discuss your learning needs.

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.

Campus Resources for Students

In your time at Georgia Tech, you may find yourself in need of support. Below you will find some resources to support you both as a student and as a person.

Academic support

- Center for Academic Success <http://success.gatech.edu>
 - 1-to-1 tutoring <http://success.gatech.edu/1-1-tutoring>
 - Peer-Led Undergraduate Study (PLUS) <http://success.gatech.edu/tutoring/plus>
 - Academic coaching <http://success.gatech.edu/coaching>
- Residence Life's Learning Assistance Program
<https://housing.gatech.edu/learning-assistance-program>
 - Drop-in tutoring for many 1000 level courses
- OMED: Educational Services (<http://omed.gatech.edu/programs/academic-support>)
 - Group study sessions and tutoring programs
- Communication Center (<http://www.communicationcenter.gatech.edu>)
 - Individualized help with writing and multimedia projects
- Academic advisors for your major
<http://advising.gatech.edu/>

Personal Support

Georgia Tech Resources

- The Office of the Dean of Students: <http://studentlife.gatech.edu/content/services>; **404-894-6367**; Smithgall Student Services Building 2nd floor
 - You also may request assistance at https://gatech-advocate.symplcity.com/care_report/index.php/pid383662?
- Counseling Center: <http://counseling.gatech.edu>; **404-894-2575**; Smithgall Student Services Building 2nd floor
 - Services include short-term individual counseling, group counseling, couples counseling, testing and assessment, referral services, and crisis intervention. Their website also includes links to state and national resources.
 - *Students in crisis may walk in during business hours (8am-5pm, Monday through Friday) or contact the counselor on call after hours at 404-894-2204.*
- Students' Temporary Assistance and Resources (STAR):
<http://studentlife.gatech.edu/content/need-help>
 - Can assist with interview clothing, food, and housing needs.
- Stamps Health Services: <https://health.gatech.edu>; **404-894-1420**
 - Primary care, pharmacy, women's health, psychiatry, immunization and allergy, health promotion, and nutrition
- OMED: Educational Services: <http://www.omed.gatech.edu>
- **Women's Resource Center:** <http://www.womenscenter.gatech.edu>; **404-385-0230**
- **LGBTQIA Resource Center:** <http://lgbtqia.gatech.edu/>; **404-385-2679**
- **Veteran's Resource Center:** <http://veterans.gatech.edu/>; **404-385-2067**
- **Georgia Tech Police:** **404-894-2500**

Statement of Intent for Inclusivity

As a member of the Georgia Tech community, I am committed to creating a learning environment in which all of my students feel safe and included. Because we are individuals with varying needs, I am reliant on your feedback to achieve this goal. To that end, I invite you to enter into dialogue with me about the things I can stop, start, and continue doing to make my classroom an environment in which every student feels valued and can engage actively in our learning community.