MATH 6001, Introduction to Graduate Mathematics

Note: the syllabus and course schedule are subject to change. Any changes to the syllabus and/or course schedule will be relayed to the students in class and through e-mail.
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Office hours: Tuesdays 1:00-2:30 PM, Wednesdays 2:15-3:45 PM, and by appointment.

Class location and times: Skiles 169, MF 12:20 PM - 1:10 PM. The Friday class will generally be replaced by mandatory attendance to Research Horizons several weeks into the semester.

Texts and online resources

1) Krantz, Steven G., A mathematician's survival guide: Graduate school and early career development, American Mathematical Society, Providence, RI, 2003, pp. xvi+222, ISBN: 0-8218-3455-X.
2) The Not So Short Introduction to LaTeX by Tobias Oetiker.
3) How to Write a Paper? by Arieh Iserles

Important Announcement

All doctoral students admitted Fall 2011 or later are required by the GT RCR Academic Policy for Doctoral Students to complete in-person RCR training. Math 6001 fulfills the in-person requirement. There is also an online CITI RCR training requirement.

Course Description

This course is a professional development course that will ensure students begin their graduate careers effectively and with the tools needed to succeed. We will have short lectures and panels with faculty in the School of Mathematics. It is expected that you do readings as assigned and come prepared with questions to ask panelists. Some topics that are covered in the course are:

- Getting involved in the mathematical community

- Finding a research advisor

- Getting the most out of math talks and conferences.

- Building a strong CV, and pursuing career paths in academia and industry

In addition, the course will fulfill the institute-mandated Responsible Conduct of Research requirements by exploring topics related to ethical and professional issues such as conflicts of interest, the peer review process, research misconduct, the responsibilities of mentors and trainees, and more.

Learning outcomes

Students completing this course will:
1. Understand the ethical and professional challenges associated with careers in the mathematical sciences.
2. Become familiar with the research being done by faculty in the School of Mathematics.
3. Be able to create a professional website and CV.
4. Be able to write papers and proposals in LaTeX.
5. Understand the importance of, and how to maximize the benefits gained from, attending seminars and conferences.

Grades

This course is offered as Pass-Fail. To receive a passing grade in the course a student must do all of the following.
1. Get a passing grade on 4 reports (typeset in LaTeX) on the Research Horizons Seminars or Colloquia. Aim for roughly a page and a half for each report.
2. Write a grant proposal for an NSF Graduate Research Fellowship (or alternative assignment).
3. Get a passing grade on a case study paper (4 pages in length) on an RCR issue. I will post a list of topics, but feel free to approach me with your own idea. This will serve as our final paper.
4. Attend all classes.

To receive a passing grade, each student must attend the entire course. If a student has to miss a class, the student must contact the instructor prior to the day of the absence (unless the absence is due to illness) so that the instructor can determine whether it will be considered excused. If an absence is considered excused by the instructor, the student must provide proper documentation within one week of returning to class (for example, a physician's note for an illness). Students will have to write make-up paper(s) for any class time that is excused. Missing class time for an unexcused reason will result in a failing grade.

The Honor Code and Academic Dishonesty

Do not cheat! Abide by the honor code at all times. See http://honor.gatech.edu and here.

Students with Disabilities and/or in need of Special Accommodations

Georgia Tech complies with the regulations of the Americans with Disabilities Act of 1990 and offers accommodations to students with disabilities. If you are in need of accommodations, please make an appointment with the Office of Disability Services to discuss the appropriate procedures. More information is available on their website. Please make an appointment with me to discuss your accommodation, if necessary.

Schedule

Monday, Aug. 21: Introduction. Class overview, RCR Compliance (see, here, here, and here, and go here for the online part). Developing a webpage. Research Horizons and its schedule. What should be in Research Horizons reports.

Friday, Aug. 25: Getting involved. The math GT site has links for the AMS Grad Student Chapter, the Association for Women in Math Chapter, the GT SIAM Student Chapter, and more. There is also the High School Math Competition, and Club Math. See the AMS blog on organizing seminars.
Panelists: Enid Steinbart, Samantha Petti, Timothy Duff

Monday, Aug. 28: Getting the most out of seminar and colloquium talks, including the "Three Things" exercise by Ravi Vakil, Stanford. Looking forward: How to attend a conference.
Panelists: Michael Damron, Mayya Zhilova, Michael Northington

Friday, Sep. 1: Grant writing, funding agencies: NSF, NIH, AMS, MAA, and others. "Broader Impacts," "intellectual merit," evaluation. NSF Graduate Research Fellowships and more fellowships, some for international students Deadline for NSFGRF proposals is October 27, 2017 (Friday) at 5:00 PM. Also, see How to win a Fellowship for Graduate Study in Mathematics, by Evans Harrell.
Panelists: Luca Dieci, Caitlin Leverson, Justin Lanier, Anna Kirkpatrick

Monday, Sep. 4: Labor Day: No classes

Friday, Sep. 8: Math arXiv, MathSciNet, LaTeX (see Oetiker's book), bibtex, Beamer, and style files. Structuring a paper; deciding where to submit a paper based on a variety of considerations such as Impact Factor.
Panelists: Dan Margalit, Wenjing Liao, Padma Srinivasan

Monday, Sep. 11: Campus closed and class canceled due to weather.

Wednesday, Sep. 13: MANDATORY ATTENDANCE AT RESEARCH HORIZONS (12:10-1:10pm, Skiles 006)

Friday, Sep. 15: Writing a CV, and choosing templates for a CV and thesis. Choosing a thesis advisor. Time management as a graduate student and mathematician.
Panelists: Sung Ha Kang, Megan Bernstein, Peter Lambert-Cole, Justin Lanier, Dan Margalit

Monday, Sep. 18: Job Search: research statement and teaching statement. Getting letters of recommendation, types of jobs, MathJobs.org and EIMS. See Jobs on Dan's TSR page; jobs in the private sector and elswhere.
Panelists: Greg Blekherman, Ronghua Pan

Wednesday, Sep. 20: MANDATORY ATTENDANCE AT RESEARCH HORIZONS (12:10-1:10pm, Skiles 006)

<u>Friday, Sep. 22</u>: **Responsible Conduct of Research (RCR)** overview; professional ethics in general; discussion of online CITI RCR training, and forms for RCR.

<u>Monday, Sep. 25</u>: RCR: The peer-review process.

<u>Wednesday, Sep. 27</u>: MANDATORY ATTENDANCE AT RESEARCH HORIZONS (12:10-1:10pm, Skiles 006)

<u>Monday, Oct. 2</u>: RCR: Math in Society; mathematicians as responsible members of society, work place conduct

<u>Wednesday, Oct. 4</u>: MANDATORY ATTENDANCE AT RESEARCH HORIZONS (12:10-1:10pm, Skiles 006)

<u>Monday, Oct. 9</u>: Fall Break: No classes.

<u>Wednesday, Oct. 11</u>: MANDATORY ATTENDANCE AT RESEARCH HORIZONS (12:10-1:10pm, Skiles 006)

<u>Monday, Oct. 16</u>: RCR: Authorship and publication, Copyright laws

<u>Wednesday, Oct. 20</u>: MANDATORY ATTENDANCE AT RESEARCH HORIZONS (12:10-1:10pm, Skiles 006)

<u>Monday, Oct. 23</u>: RCR: What is plagiarism? Self-plagiarism, plagiarism-detection software.

<u>Wednesday, Oct. 25</u>: MANDATORY ATTENDANCE AT RESEARCH HORIZONS (12:10-1:10pm, Skiles 006) Grant Writing check-up day

<u>Monday, Oct. 30</u>: RCR: Collaborative research.

<u>Wednesday, Nov. 1</u>: MANDATORY ATTENDANCE AT RESEARCH HORIZONS (12:10-1:10pm, Skiles 006)

<u>Monday, Nov. 6</u>: RCR: Data acquisition, management, ownership, and sharing. Posting papers on your website.

<u>Wednesday, Nov. 8</u>: MANDATORY ATTENDANCE AT RESEARCH HORIZONS (12:10-1:10pm, Skiles 006)

<u>Monday, Nov. 13</u>: RCR: The responsibilities of mentors and trainees.

<u>Wednesday, Nov. 15</u>: MANDATORY ATTENDANCE AT RESEARCH HORIZONS (12:10-1:10pm, Skiles 006)

<u>Monday, Nov. 20</u>: RCR: Research misconduct and policies for handling research misconduct.

<u>Wednesday, Nov. 22 and Friday, Nov. 24</u>: Thanksgiving holiday, no class or Research Horizons

<u>Monday, Nov. 27</u>: RCR: Conflicts of interest.

<u>Wednesday, Nov. 29</u>: MANDATORY ATTENDANCE AT RESEARCH HORIZONS (12:10-1:10pm, Skiles 006)

<u>Friday, Dec. 1</u>: Final Project Paper Due

Some Additional Resources

Responsible Conduct of Research links

- Georgia Tech RCR homepage

- Georgia Tech's RCR compliance policy

- Online RCR training

- Springer Author Academy

- Retractions in math

- MAA handbook for TAs

Academic employment sites and the NSF graduate fellowship site.

- NSF Graduate Research Fellowship Program (GRFP)

- MathJobs.org

- EIMS

Various AMS and ethics links.

- AMS Author Resource Center

- AMS Site on Ethics in Mathematics

- How to Avoid Plagiarism, Provost's office, Northwestern University