

Overview of MS Programs for New Students

School of Mathematics, Georgia Tech



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See

people.math.gatech.edu/~ghomi/GraduateProgram/MScourses.pdf

for a hyperlink version of this presentation.

Outline

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Degree requirements

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Glossary

MS Degrees offered

- ▶ Mathematics (Math)
- ▶ Computational Sciences and Engineering (CSE)
- ▶ Quantitative and Computational Finance (QCF)

joint with: Management, and Industrial and Systems Engineering

- ▶ Statistics

joint with: Industrial and Systems Engineering

MS Math

1. at least 30 credit hours
2. at least 21 hours at the 6000-level or above 18 hours of which must be in math with a B or better
3. at least 2 course from Analysis:

6321 Complex Analysis

6338 Real Analysis II

7334 Introduction to Operator Theory

7338 Functional Analysis

6337 Real Analysis I

6580 Intro. to Hilbert Spaces

7337 Harmonic Analysis

and at least one of the courses must be 6337 or 6338

4. At least one class in two of the following areas:

Algebra	6112 Advanced Linear Algebra 6122 Algebra II 6422 Algebraic Geometry II	6121 Algebra I 6421 Algebraic Geometry I
Differential Equations	6307 Ordinary Differential Equations I 6341 Partial Differential Equations I	6308 Ordinary Differential Equations II 6342 Partial Differential Equations II
Discrete Mathematics	6014 Graph Theory 7016 Combinatorics 7018 Probabilistic Methods in Comb.	7012 Enumerative Combinatorics 7014 Advanced Graph Theory
Geometry and Topology	6441 Algebraic Topology I 6457 Intro. to Geometry and Topology I	6455 Differential Geometry I 6458 Intro. to Geometry and Topology II
Numerical Analysis	6640 Intro. to Numerical Methods for PDE 6644 Iterative Methods for Systems of Eqns 6646 Numerical Methods for ODE	6643 Numerical Linear Algebra 6645 Numerical Approximation Theory
Probability and Mathematical Statistics	6241 Probability I 7244 Stoc. Proc. and Stoc. Calc. I 6262 Statistical Estimation 6266 Linear Statistical Models	6242 Probability II 7245 Stoc. Proc. and Stoc. Calc. II 6263 Testing Statistical Hypotheses 6267 Multivariate Statistical Analysis

MS Math

5. Classes taken to satisfy requirements 3 and 4 must be passed with B or better.
6. Classes at 3000-level or below or MATH 6701 and 6702 do not count towards the hours for a masters.
7. Need an overall GPA of 2.7 or above.
8. Any class counting towards the degree must be complete with a C or better.
9. Only 3 hours pass/fail (except for thesis hours).
10. **(NON-THESIS OPTION)** Must have at least 18 hours at the 6000-level or above with a B or better. The remaining 12 hours are "free electives" (4000-level or above).

11. (THESIS OPTION)

- 11.1 The remaining 18 hours must be at the 4000-level or above and can include 9 hours of thesis writing.
- 11.2 There will be a thesis defense consisting of a presentation of the thesis followed by questions related to the thesis.
- 11.3 There will be a committee consisting of three or more members chosen by the committee chair, ordinarily the advisor of the thesis, in consultation with the graduate coordinator.
- 11.4 Need to fill out thesis option form
www.math.gatech.edu/system/files/ms_thesis_option.pdf

MS CSE

1. At least 30 credit hours
2. At least 4 of the following 5 (core curriculum) courses
 - ▶ CSE/Math 6643 (Numerical Linear Algebra),
 - ▶ CSE 6140 (CSE Algorithms),
 - ▶ CSE 6730 (Modeling and Simulation: Fundamentals & Implementation),
 - ▶ CSE/ISYE 6740 (Computational Data Analysis), and
 - ▶ CSE 6220 (High Performance Computing).
3. GPA of at least 3.0 for all courses listed on his/her degree program (these courses cannot be taken on pass/fail basis).
4. A home unit minor is required consisting of 12 hours of coursework relevant to the CSE discipline that includes one applications area. At least 6 hours of these must be courses that do not carry the CS/CSE course designation.

MS CSE

5. The remaining six hours can be completed either as additional hours of approved coursework (course option) or by writing a MS thesis (thesis option). The latter has to be approved by, and defended to, the student's thesis committee, who is responsible for overseeing the student's research.
6. Only 3 hours pass/fail (except for thesis hours).
7. Must maintain the institute minimum of 2.7 GPA or higher.
8. **Important:** The plan of study must be approved by the CSE program director and the student's home unit coordinator.

*The School of Math's coordinator and lead advisor for the CSE program is Professor **Sung Ha Kang** (kang@math.gatech.edu.)*

MS Stat

1. Must take (for a total of 12 hours)
 - ▶ Math 4261 Mathematical Statistics I
 - ▶ Math 4262 Mathematical Statistics II
 - ▶ ISyE 6413 Design and Analysis of Experiments
 - ▶ ISyE 6414 Statistical Modeling and Regression Analysis

2. Take 5 courses from the statistics electives (for a total of 15 hours)

- ▶ Math 4317 Real Analysis
- ▶ Math 6262 Statistical Estimation
- ▶ Math 6263 Testing Statistical Hypotheses
- ▶ Math 6266 Linear Statistical Models
- ▶ Math 6267 Multivariate Statistical Analysis
- ▶ ISyE 6402 Time-Series Analysis
- ▶ ISyE 6404 Nonparametric Data Analysis
- ▶ ISyE 6405 Statistical Methods for Manufacturing Design and Improvement
- ▶ ISyE 6412 Theoretical Statistics
- ▶ ISyE 6416 Computational Statistics
- ▶ ISyE 6420 Bayesian Statistics
- ▶ BME/ISyE 6421 Biostatistics
- ▶ MATH/ISyE 6761 Stochastic Processes I
- ▶ MATH/ISyE 6762 Stochastic Processes II
- ▶ Math/ISyE 6781 Reliability Theory
- ▶ Math/ISyE 6783 Financial Data Analysis
- ▶ ISyE 6810 System Monitoring and Prognostics
- ▶ ISyE 7400 Advanced Design of Experiments I
- ▶ SyE 7401 Advanced Statistical Modeling
- ▶ ISyE 7405 Multivariate Data Analysis
- ▶ ISyE 7406 Data Mining

- ▶ ISyE 7441 Theory of Linear Models

3. Last 3 hours can be chosen freely at the 4000-level or above.
4. Only 3 hours pass/fail.
5. Must maintain the institute minimum of 2.7 GPA or higher.

*The School of Math's coordinator and lead advisor for the MS Stat program is Professor **Vladimir Koltchinskii** (vladimir.koltchinskii@math.gatech.edu).*

Registration

- A. To be a full time student you must register for at least 12 hours per semester (but no more than 21).
 - ▶ If you are a TA, RA or on a visa you must be full time.
 - ▶ At least 9 of those 12 must be taken Pass/Fail (P/F) or for a Letter Grade (LG). The remaining 3 hours can be for Audit.
 - ▶ If you enroll in the summer, you still must take 12 hours of courses, but 6 of those hours can be Audit.
- B. Special Classes I (if you are a TA or RA):
 - ▶ Math 8997 — the TA course, 3 hours for Audit only.
 - ▶ Math 8998 — the RA course, 3 hours for Audit only.
- C. Special Class II:
 - ▶ Math 8900 — Special Problems/Directed Study.
- D. First time you TA you must take CETL 8000 with Klara Grodzinsky. This is 1 hour, P/F.
- E. International TAs will also take Math 8305 (ESL) with Cathy Jacobson/Mo Burke. This is a 2 hour P/F course.

Logistics

- A. e-mail: You have a Georgia Tech email account (ending in “@gatech.edu”). Check this often (at least once a day!) Especially when you are TAing. If you don't you will miss something important.
- B. Offices: if you are a TA you will have a desk in one of our 12 person offices.
- C. TA duties:
 - ▶ Normally you will have “5 contact hours” a week. That is 2, 2 hour recitation sections and 1 hour in the math lab. In addition, you will need to hold office hours, prepare for your recitation session, grade,...
 - ▶ In your first semester you get a lighter load so you can take CETL 8000 and to help get acclimated to Georgia Tech.
 - ▶ In a normal semester we expect you to work about 1/3 time on your TA duties. That should average to about 13 hours. If you are consistently working over the 13 hours please let Klara Grodzinsky or me know about it.

Finding help

Comprehensive info about all graduate programs in the School of Math is available at:

www.math.gatech.edu/academics/graduate/graduate-programs

In particular, see the page for current students:

www.math.gatech.edu/academics/graduate/current-students

Please send me an email if you have any suggestions for improving above websites, or find any typos, errors, or broken links.

Finding help

- ▶ Academic and programatic concerns:
 - ▶ Mohammad Ghomi — Director of Graduate Studies
 - ▶ Chris Jankowski — Director of Advising and Assessment
 - ▶ Mitchell Everett — Grad. Program Coordinator
(all the above people read dgs@math.gatech.edu)
- ▶ For teaching concerns (if you are a TA):
 - ▶ Klara Grodzinsky — TA Coordinator
 - ▶ Igor Belegradek — Director of Teaching Effectiveness (DOTE)
- ▶ For Registration and Permit issues:
 - ▶ Send an email to academics@math.gatech.edu
(This is normally handled by Luz Arevalo).

Glossary

Georgia Tech uses some special terminology. These might be useful to you as you read the general catalogue, students handbooks, or other publications of the School or the Institute:

- ▶ **Institute** means the *University*.
- ▶ **School** means *Department*, as in School of Mathematics.
- ▶ **Math** refers not just to *Mathematics*, but also to the *MS program in Mathematics*, as opposed to other MS programs housed in the School of Math (CSE, QCF, Stat).
- ▶ **SOM** stands for the *School of Math*



Best wishes and good luck!