

# 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](http://people.math.gatech.edu/~ghomi/GraduateProgram/MScourses.pdf)

for a hyperlink version of this presentation.

# Outline

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# 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:

<b>Algebra</b>	6112 Advanced Linear Algebra 6122 Algebra II 6422 Algebraic Geometry II	6121 Algebra I 6421 Algebraic Geometry I
<b>Differential Equations</b>	6307 Ordinary Differential Equations I 6341 Partial Differential Equations I	6308 Ordinary Differential Equations II 6342 Partial Differential Equations II
<b>Discrete Mathematics</b>	6014 Graph Theory 7016 Combinatorics 7018 Probabilistic Methods in Comb.	7012 Enumerative Combinatorics 7014 Advanced Graph Theory
<b>Geometry and Topology</b>	6441 Algebraic Topology I 6457 Intro. to Geometry and Topology I	6455 Differential Geometry I 6458 Intro. to Geometry and Topology II
<b>Numerical Analysis</b>	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
<b>Probability and Mathematical Statistics</b>	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](http://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](mailto: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 **Karim Lounici** ([klounici6@math.gatech.edu](mailto:klounici6@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](http://www.math.gatech.edu/academics/graduate/graduate-programs)

In particular, see the page for current students:

[www.math.gatech.edu/academics/graduate/current-students](http://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
  - ▶ Marty Engman — Director of Advising and Assessment
  - ▶ Mitchell Everett — Grad. Program Coordinator  
(all the above people read [dgs@math.gatech.edu](mailto:dgs@math.gatech.edu))
- ▶ For teaching concerns (if you are a TA):
  - ▶ Klara Grodzinsky — TA Coordinator
  - ▶ Xingxing Yu — Director of Teaching Effectiveness (DOTE)
- ▶ For Registration and Permit issues:
  - ▶ Send an email to [academics@math.gatech.edu](mailto: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*
- ▶ **Tech** means *Georgia Tech*



Best wishes and good luck!