# UNC DEPARTMENT OF MATHEMATICS
# UNDERGRADUATE ADVISING

# WHO TO CONTACT WITH QUESTIONS

REGISTERING FOR MATH CLASSES?

unc_math@unc.edu

SATISFYING DEGREE REQUIREMENTS?

Academic Advising
https://advising.unc.edu/advisor/
Steele Building/Hardin Hub

COURSE CONTENT OR WHICH CLASS?

A math department advisor
(reach out to unc_math@unc.edu)
or the course instructor
(especially for special topics, MATH 590)

# MATH MAJOR OVERVIEW

THESE ARE NOT THE COMPLETE REQUIREMENTS, BUT AN OVERVIEW OF MATH COURSES AT HIGHER LEVEL

COMPLETE INFO:
https://catalog.unc.edu/undergraduate/departments/mathematics/

- **BA Mathematics**
  - 381, 383, 347 or 577, 521, + 3 above 500

- **BS Mathematics**
  - 381, 383, 347 or 577, 521, + 5 above 500
  - one from {522, 523, 528, 566} one from {533, 534, 548, 578}

- **BS Mathematics (Applied Option)**
  - 381, 383, 347 or 577, 521, + 5 from {522, 523, 524, 528, 529, 535, 548, 560, 564, 566, 661, 668, 383L-528L-529L}

  - At least 3 from {528, 529, 560, 564, 566, 661, 668, 383L-528L-529L}

  For the general BS, MATH 590 will count as one of the over 500 courses automatically. For the applied BS, because 590 is not on the list of classes, it will not be automatically applied (also, some topics are not applied topics), you would need to contact the Director of Undergraduate Studies, to have 590 count towards the applied BS.

# COURSE OVERVIEW

| | Courses | | |
|---|---|---|---|
| **first tier** | 231 | 232 | 233 |
| **second tier** | 383(L) | 347 | 381 |
| | Diff Eq. | Lin. Alg. | Discrete |
| **third tier** | 523 - Complex Variables<br>524 - Elem. Diff. Eq. (F)<br>528(L) - Math Methods I<br>529(L) - Math Methods II (S)<br>553(L) - Math. Comp. Models Bio. (F)<br>560 - Optimization (S)<br>563 - Fluid Mechanics (S)<br>564 - Math Models in Life Sci (F)<br>566 - Num. Analysis | 535 - Probability | 521 - Adv. Calc I<br>522 - Adv. Calc II (S)<br>533 - Elem. Theory Num. (F)<br>534 - Elem. Modern Alg. (S)<br>548 - Combinatorial Math.<br>550 - Topology (F)<br>551 - Euclid. Non. Euclid. (F) Geometries<br>577 - Lin. Algebra (F)<br>578 - Alg. Structures (S) |
| | | 590 – Special Topics | |

S - typically Spring only,     F - typically Fall only,     L - optional Lab component

# GRADUATE CLASSES

▸ Permission of the instructor is required

▸ Must have completed the undergraduate version

▸ Beneficial when applying to graduate school, both in terms of the actual application and in helping to narrow down interests

| Course | Area | Pre-Reqs |
|---|---|---|
| 653, 656 | Real and Complex Analysis | 521, 522 |
| 661, 662 | Scientific Computing | 566 |
| 668, 669 | Methods of Applied Math | 528, 529 |
| 676, 677 | Algebra | 577, 578 |
| 680, 681 | Geometry and Topology | 550 |

# SUMMER CLASSES

▸ Select upper-level classes are offered over the summer in one, or both, summer sessions: https://summer.unc.edu/

▸ Typically Offered:

   ▸ 381, 383(L), 347

   ▸ 521

   ▸ 528(L), 533, 535, 566

# STUDY ABROAD

**UNC Faculty Lead:**

▸ [Math in Firenze](#)

   MATH 381 – contact Professor Sawon – sawon@email.unc.edu

▸ [Math in Stockholm](#) (plans to return Summer 2025)

   MATH 381 – contact Professor Rose – davidrose@unc.edu

**Longer Programs:**

▸ [Budapest Semesters in Mathematics](#) (Spring, Summer, and Fall)

**Other Partnerships for Math & Non-Math Courses:**

▸ [National University of Singapore](#)

▸ [King's College London](#)

# CONSIDERING GRADUATE SCHOOL

▸ GRE Math Subject Test required for many programs

  ▸ calculus 50%, algebra 25% (linear, abstract, number theory), additional 25% (real analysis, discrete math, combinatorics, topology, geometry, probability, complex variables, numerical analysis)

▸ Within Mathematics programs, many have different "flavors" (pure, applied, math biology…) so suggested courses to prepare vary

  ▸ Solid foundation in analysis, linear algebra, and differential equations

  ▸ Courses to prepare for GRE, if program requires score

# DATA SCIENCE CLASSES

- Suggested Math Classes
  - Calculus sequence, MATH 381, 347
  - MATH 210 – Mathematical Tools for Data Science
  - MATH 560 – Optimization
  - MATH 566- Intro to Numerical Analysis

- Suggested Computer Science Classes
  - COMP 210 – Data Structures
  - COMP 301 – Foundations of Programming
  - COMP 550 - Algorithms

- Suggested Statistics Classes
  - STOR 320 – Statistical computing
  - STOR 415 – Decision analytics/Optimization
  - STOR 455 - Methods of data analysis
  - MATH 535/STOR 435 – Probability

- Even more options
  - COMP 560, 562, 535, 581, 486
  - STOR 445, 556, 555

# CAREERS

▸ Popular Careers for Math Majors

| | |
|---|---|
| Actuary | Optimizer |
| Analyst | Statistician |
| Data Scientist | Computer Analyst |
| Mathematician | University Professor |
| Modeler | |

## AMS Career Info

▸ American Mathematical Society

▸ MAA Careers in Math

▸ Mathematical Association of America

▸ Many other fields value an education in mathematics!!!

# WHERE MATH MAJORS GO (GRADUATE SCHOOL):

Yale (Physics)

Harvard (Applied Math, PHD)

UNC (Mathematics)

UNC (Biostatistics)

UNC (Masters in Teaching - Secondary Mathematics)

Duke (Biostatistics)

Georgia Tech (Mathematics)

Duke (Business Analytics)

Columbia (MS Data Science)

UC Berkeley (Electrical Engineering and Computer Sciences)

NCSU (Data Analytics)

# WHERE MATH MAJORS GO (CAREERS):

NextEra Energy, Ignite Leadership Program
Fullstack Engineer at Fidelity
AstraZeneca (Graduate Scientist)
United Health Care (Network Pricing)
UNC (Research Technician)
DRW Holdings

JP Morgan Chase
iD Tech (Online Instructor)
Oliver Wyman (Analyst)
LabCorp (Data Analyst)
Sequence (Consultant)
R4 Capital (Financial Analyst)
CapTech Ventures (Associate Consultant)

# HeelsEngage

**Please consider joining the [Department of Mathematics Heels Engage Group](). By joining the group, you can:**

- Connect with former math alumni
- Review new opportunities for math majors
- Participate in student discussions
- Meet with other students and mentors who have similar interests and majors

# OPPORTUNITIES FOR UNDERGRADUATES

- [Honors Thesis](#)

  - Part of the requirement for Graduation with Honors

- [Directed Reading Program](#)

  - Pairs undergrad with grad student for semester-long independent study

- [Association for Women in Mathematics](#)

  - Foster a sense of community and promote diversity within mathematics

- [Carolina Math Club](#)

  - Talks by professors, grad students, and undergrads and social events

- MATH294 Problem Solving Seminar - contact Prof Sawon [sawon@email.unc.edu](mailto:sawon@email.unc.edu)

  - [Putnam](#) (1st Saturday in Dec) competition

- [Undergraduate Learning Assistant](#)

  - Volunteer, credit, or work study to assist in undergraduate classes

- [Peer tutor at the Learning Center](#)

  - Earn 3 hours of EE credit (EDUC 387), then potential to get hired