

STUDENT HANDBOOK FOR UNC ASHEVILLE MATHEMATICS & STATISTICS MAJORS

Fall 2022 - Spring 2023 - Summer 2023



WELCOME

To Prospective Mathematics and Statistics Students:

Welcome to the Department of Mathematics and Statistics! I am delighted to know you are considering a math major, math minor, or even taking a few more math and stats classes. We are grateful to have you part of our community. We value diversity of experience and diversity of understanding and recognize the contributions that all our students, staff, and faculty bring to each learning opportunity.

As a math major, our curriculum gives you both breadth and depth in each of our four tracks: statistics, applied math, pure math, and teacher licensure. There are a broad range of career opportunities awaiting those with mathematical training, due to the universal need for people with strong analytical and problem solving skills.

As with any skill, one learns mathematics and statistics best by actually doing mathematics and statistics. We therefore encourage our students to play an active role in their learning, both in their classes and outside of them, where we craft a culture that supports active learning through seminars, research opportunities, trivia nights, and other opportunities to learn and build community.

We also acknowledge that doing mathematics and statistics is difficult. We strive to cultivate an environment where struggle is both expected and encouraged, and where everyone, regardless of their experience level, feels comfortable seeking help when needed.

Our majors have the opportunity to engage in undergraduate research, service learning, attend local and regional conferences, and enroll in internships. We also provide a number of fun events, including trivia nights, career panels, and math recitals!

We are located on the third floor of Robinson Hall. Please come by and look at our facilities, including the Parsons Math Lab, a great place to learn and study mathematics. Visit us on the web (math.unca.edu) or Facebook (@mathematics.asheville).

If you have any questions concerning mathematics at UNC Asheville, please feel free to contact me at bsanft@unca.edu or call the department office at (828) 251-6556.

Dr. Becky Sanft
Chair and Associate Professor
Department of Mathematics and Statistics



math.unca.edu

EDUCATIONAL RESOURCES

Parsons Math Lab

The Mathematics Department maintains a professionally staffed learning resource center known as the Math Lab. Designed for students, the center provides additional help for introductory mathematics courses and a space for students to collaborate on classwork. Students have an open invitation to drop in at any time to study, obtain help, and work in groups. Computers with mathematical software are also available.

In addition to staff members, the Math Lab employs mathematics majors to help tutor students. This facility is open Monday - Thursday from 8:30 a.m. to 9:00 p.m, Friday from 8:30 a.m. to 5:00 p.m., and Sunday from 4:30 p.m. to 8:00 p.m. Follow the link to the Math Lab page for more information. <https://math.unca.edu/learn/math-lab/>

Scholarships

The Math Department has three student scholarships awarded each year to Junior and Senior Math majors. Regardless of track, eligible students should consider applying for the **Parsons Scholarship** and the **Jane Oliver Swafford Scholarship**. Teaching track students may apply for the **Martha Games Scholarship**. Math majors may send an application in the **spring semester** for awards given for the following academic year. The committee chair sends application due dates and information to all Math majors by email.

Information Resources

Centrally located on campus is **D.H. Ramsey Library**. It has a wide selection of traditional reference resources. It maintains the portals *JSTOR* and *MathSciNet*, which allow you to access hundreds of scientific journals using UNC Asheville's campus-wide wireless Internet.

The campus's Information Services also maintains site licenses to several essential mathematical software tools, including *Mathlab*, *Mathematica*, *SAS*, and *Minitab*.

ADDITIONAL PROFESSIONAL OPPORTUNITIES

Summer Research Programs

Every summer, several of our students participate in summer math programs across the country. Many of these are fully supported and offer a stipend. The NSF-REU programs have students spend eight weeks at another campus doing math research. These programs cover room and board as well as a stipend. Participants are typically between their junior and senior years.

There are also opportunities for students to participate in the Cross-Institutional Undergraduate Research Experience (CURE) as part of UNC Asheville's institutional membership to the Intercollegiate Biomathematics Alliance. CURE offers a summer workshop to guide students through the entire research process including literature review, data analysis, and technical writing where they can also connect with faculty to engage in a research project through the summer and school year.

Regional Math Conferences

The department encourages its majors to participate in professional mathematics conferences. The Department of Mathematics and Statistics has been able to provide financial support for students to present conferences, including the regional and national MAA (Mathematics Association of America) Conference and the Annual Undergraduate Conference at the Interface of Mathematics and Biology held at University of Tennessee.

Study Abroad

Students may complete mathematical study programs at universities overseas. Two popular programs are the Budapest Semester in Mathematics and the Math in Moscow Program, and national math societies endorse both. One of our faculty, Dr. Boudreaux, led four study abroad trips to Greece, Turkey, and Italy. Students take a university course, typically History of Mathematics, while visiting the historical sites on these trips.

Math Recital

Every spring, the Math Department hosts a recital. Everyone is welcome! If you dance, sing, recite poetry, juggle, play an instrument, tell jokes, do magic tricks, tell stories, etc., please share your talent and enjoy the talent of others.

Career Panel

The Department of Mathematics and Statistics hosts an annual career panel, which often includes alumni of our department. Some of the career paths of our alumni can be found at <https://math.unca.edu/whats-next/alumni-profiles/>.

Parsons Lecture

In 1998, a Mathematics alumnus from UNC Asheville provided an endowment, in honor of Joe Parsons, to fund an annual lecture series. The department invites speakers to present a mathematics lecture for the general public and raise awareness of the relevance of Mathematics.

FACULTY PROFILE

BEHARRYSINGH, Rudy – Director of the Joe Parsons Assistance Center (Math Lab); BS, 1984, McGill University; MS, 2002, Western Carolina University.

Interests: Applied mathematics, environmental applications, alternative energy, economics.

BOUDREAUX, Gregory – Associate Professor; BS, 1987, Loyola University; MS, 1996, Ph.D., 2001, University of Louisiana at Lafayette.

Interests: abstract algebra, topology and mathematics informed by history.

Additional Responsibilities: Coordinator of Study Abroad in Greece/Turkey; Putnam/VTRMC Math Contests; Faculty Standing Committees; Science Olympiad scorekeeper; Faculty Senate member.

CHENG, Kedai – Assistant Professor; BA of Economics, 2013, Indiana University Bloomington, BS of Mathematics, 2013, Indiana University Bloomington, MS of Economics, 2015, Indiana University Bloomington, MS of Statistics, 2017, University of Kentucky, Ph.D. of Statistics, 2020, University of Kentucky.

Interests: Tolerance Regions, Time Series Analysis, Nonparametric Statistics and Methodology, Machine Learning Algorithms, Regression Analysis, Statistical Quality Control.

KAPLAN, Samuel – Professor; BS, 1990, University of North Carolina; MA, 1992, Boston University; Ph.D., 1996, Boston University.

Interests: differential equations, chaos, math and music.

Additional Responsibilities: Chair of the Mathematics & Statistics Department, Director of the Asheville Initiative in Math, Co-Director of the Marvelous Math Club.

LEE, Jimin – Professor; BS, 1996, Kyungpook National University, Korea; MS, 2006, and Ph.D., 2008, University of North Carolina Charlotte.

Interests: applied statistics, survival analysis, application of statistical models to real problems.

McCLURE, Mark C. – Professor; BS, 1988, and Ph.D., 1994, Ohio State University.

Interests: fractal geometry and measure theory.

PEIFER, David E. – Professor; BA, 1986, Northeastern Illinois University; Ph.D., 1992, University of Illinois.

Interests: modern algebra and geometric group theory.

POWELL, Megan – Assistant Professor; BS, 2000, University of Michigan; MS, 2003, Oregon State University; Ph.D., 2011, University of Toledo.

Interests: Mathematical biology, infectious disease dynamics, sports analytics.

SANFT, Becky – Associate Professor; BS, 2003, College of William and Mary; Ph.D., 2009, University of Arizona.

Interests: mathematical biology, applied mathematics, biomechanics.

WEBSTER, Julia – Lecturer; BS, 2001, Haverford College; MAT, 2008, Western Carolina University.

Interests: mathematics education, applied mathematics.

WHITLOCK, Cathy – Lecturer; BS, 1989, Salem College, Winston-Salem, NC; MS, 1995, North Carolina State University.

Interests: applied mathematics and mathematics education.

ADJUNCT FACULTY

CODD, Trent – AA, 1968, Miami-Dade College; BS, 1971, University of Miami; MA, 1974, (Mathematics) University of Miami; EASGC, 1982, (Educational Administration & Supervision) Florida International University; BSCS, 1985, (Computer Science) Florida International University; Graduate Study, 1988, (Technology in Education) Western Carolina University.

KOH, Eunmee – BS, 1981, Seoul National University; MS, 1985, and Ph.D., 1989 (Statistics) University of Wisconsin - Madison.

MARTIN, Bryan - BS, 1997 Western Carolina University; MS, 1999, (Applied Mathematics) Western Carolina University; Graduate Study, 2003, (Mathematical Ecology) University of Tennessee Knoxville

RASCHE, Michael – B.S., 2007, Rose-Hulman Inst. of Tech.; MS, 2010, and Ph.D., 2015 (Chemical Engineering) University of Illinois.

SPICUZZA, Bob – BS, 1969, Worcester Polytech Institute; MS, 1972, and Ph.D., 1976 (Physics) University of Connecticut.

WEBB, Robby – BA 1986, University of North Carolina Asheville; MAEd, 1996, Western Carolina University.

THE CURRICULUM

Declaration of Major

To declare a major, students need to complete and submit a *Declaration of Major* form online at <https://www.unca.edu/academics/academic-success/declaring-your-major/>. Students are encouraged to talk to faculty in the Department of Mathematics and Statistics to discuss the four tracks of the major before declaring the major. A major must be declared once students earn 60 semester hours, but we encourage students to declare in their sophomore year. Once a student declares they will be assigned an advisor in the department.

The department designed the mathematics major to provide the student with a foundation in mathematics while giving the student a deeper understanding of a specific concentration. There are four concentrations to choose from: Pure (theoretical) Mathematics, Applied Mathematics, Mathematics with Teacher Licensure, and Statistics.

Course Requirements

All students, in addition to the Liberal Arts Core Requirements, must complete the following coursework. For specific courses, see individual programs. The assumption is a student's mathematical background is sufficient to start with calculus. If this is not the case, he or she must take MATH 167, Precalculus.

- I. **Required courses in the major:** 39-40 hours, including **MATH 191, 192,** and **291** (*Calculus I, II, and III*), **MATH 280** (*Math Foundations*), **MATH 365** (*Linear Algebra I*), **MATH 381** (*Problems in Mathematics*), **MATH 480** (*Senior Seminar*), and 18-19 additional hours of courses in mathematics or statistics. See specific concentrations for exact course requirements.
- II. **Required courses outside the major:** 9-31 hours, including 3 hours in CSCI 182 or 183 (*Intro to Prog for Numeric Appl* or *Intro Prog for Media Appl*). See specific concentrations for possible options.
- III. **Other departmental requirements:** passing score on the comprehensive mathematics exam.

The comprehensive exam consists of a standardized two-hour exam, usually given at the end of MATH 381, *Problems in Mathematics*. If a student fails to attain a passing score, he or she may need to do additional work in mathematics to fulfill this requirement. Students take this exam during their next to last semester.

Concentration in Applied Mathematics

The department structured the Applied Mathematics Concentration around the premise that Mathematics is a valuable tool in many academic areas. The program requires students to take upper-level courses in a second discipline of their choosing and encourages students to explore the connections between mathematics and their chosen second discipline. By developing expertise in two areas, students increase their future studies and employment options after they graduate.

- I. **Required courses in the major:** 39-40 hours, including: **MATH 191, 192, 280, 291, 365, 381, 394, 480, 491; STAT 225 or 425;** one course from **MATH 366, 395, 441, 452** or **STAT 426;** and 6 additional hours in Mathematics or Statistics at the 300-400 level.
- II. **Required courses outside the major:** 18 hours, including **CSCI 182 or 183,** and at least 15 additional hours from a discipline in which mathematical applications are essential. The department chair must approve these courses. 9 of the 15 hours must be at the 300-400 level.
- III. **Other departmental requirements:** a satisfactory performance on a comprehensive Mathematics exam and the satisfactory presentation of one seminar in **MATH 480.** Successful completion of **MATH 480** demonstrates oral competency. Successful completion of **CSCI 182 or 183** demonstrates computer competency.

Concentration in Pure Mathematics

This area consists of a traditional Mathematics major. It serves well as a solid liberal arts major. The appropriate selection of the major options will give the student adequate preparation for graduate study in mathematics.

- I. **Required courses in the major:** 39-40 hours, including **MATH 191, 192, 280, 291, 365, 381, 394, 461, 480, 491,** and an additional 9-10 hours chosen from **STAT 225** and Mathematics or Statistics at the 300-400 level. These last hours must include either: one from **MATH 366, 462, 492;** or the sequence **STAT 425-426.**
- II. **Required courses outside the major:** 9-11 hours, consisting of **CSCI 182 or 183,** and one of the following groups of courses: **CHEM 111, 132, 145 and 236;** or **ECON 101 and 102;** or **PHYS 221 and 222;** or at least 6 credit hours of courses at the 300-level or above, approved by the department chair, from disciplines in which mathematics plays a significant role.
- III. **Other departmental requirements:** Satisfactory performance on a comprehensive Mathematics exam and the satisfactory presentation of one seminar in **MATH 480.** Successful completion of **MATH 480** demonstrates oral competency. Successful completion of **CSCI 182 or 183** demonstrates computer competency.

Concentration in Statistics

The department designed this program for students who have an interest in probability and statistics. Graduates may pursue a career in actuarial science, quality control or related fields, or enter a graduate program in statistics, mathematics, or a related discipline.

- I. **Required courses in the major:** 40 hours, including **MATH 191, 192, 280, 291, 365, 381, 480; STAT 185 or 225, and 325, 326, 425, 426;** and an additional 3-hour Mathematics or Statistics course numbered above 300. The department strongly advises students intending to pursue graduate study to take **MATH 491**.
- II. **Required courses outside the major:** 9 hours, including **CSCI 182 or 183**, and either **ACCT 215 and ECON 306**, or **ECON 102 and 305**, or **MGMT 220 and 380**, or 6 hours at the 300-400 level approved by the department chair from disciplines which routinely employ statistical methodology. Students interested in actuarial science are strongly encouraged to take **ACCT 215, ECON 101, 102, 305**, and **306**.
- III. **Other departmental requirements:** Satisfactory performance on a comprehensive Mathematics exam and the satisfactory presentation of one seminar in **MATH 480**. Successful completion of **MATH 480** demonstrates oral competency. Successful completion of **CSCI 182 or 183** demonstrates computer competency.

Concentration in the Teaching of Mathematics

The department designed this area to provide a good mathematics background for those students planning to teach mathematics at the secondary level. Completing this program also satisfies the requirements for secondary licensure in mathematics. Students seeking middle school licensure should review requirements found in the Education section of the catalog and see the appropriate licensure advisor for additional information.

- I. **Required courses in the major:** 40 hours, including **MATH 191, 192, 280, 291, 332, 365, 381, 461, 480, STAT 225**, and an additional 9 hours chosen from **MATH 251** and Mathematics or Statistics courses numbered at or above the 300-level.
- II. **Required courses outside the major:** 32 hours, consisting of **CSCI 182 or 183, PSYC 319**, and **EDUC 210, 211, 314, 346, 383, 455, 456**. Please see the Education curriculum for more detail.
- III. **Other departmental requirements:** Satisfactory performance on a comprehensive Mathematics exam and the satisfactory presentation of one seminar in **MATH 480**. Successful completion of **MATH 480** demonstrates oral competency. Successful completion of **CSCI 182 or 183** demonstrates computer competency.

Mathematics Minor

The minor requires 21 hours in mathematics or statistics, including **MATH 191, 192**, and **291**. Choose the remaining 9 hours from 300-400 level MATH or STAT courses. Complete ½ of the hours required and a minimum of 6 hours of 300-400 level courses for a minor at UNCA.

Preparation for Graduate School

Students who wish to continue their mathematics studies in graduate school should consider completing **MATH 461, 462, 491, and 492**. They should also elect additional upper-level mathematics courses in fields of their interest to broaden their understanding. The requirements for graduation listed in the catalog reflect minimum standards. A student who wishes to have a sound education in mathematics should use the opportunities provided by this university and its Mathematics Department to broaden his or her knowledge base. The best preparation for advanced studies in mathematics is to understand the different branches of mathematics.

Undergraduate Research

The department does not require undergraduate research in the mathematics major; however, it is an excellent opportunity for students who plan to continue to graduate studies or enjoy doing research. If you are interested, talk with a mathematics professor to discuss possible topics.

Most research students work one or two semesters and typically begin in the second semester of their junior year. Below is a list of a few of the past student research projects and the faculty advisors.

- Impulse Vaccination Model for the Control of Devil Facial Tumor Disease (Powell)
- Survival Analysis of time to Declare a Major for Undergraduate Students (Lee)
- Race, Gender, and Profiling: An Examination of Traffic Stop Data in Asheville, North Carolina (Lee)
- Predicting blood pressure using demographics and consumers' behaviors (Lee)
- Modeling the Mechanical Response of Arteries (Sanft)
- A computational analysis of rotor-stator interactions in ATP-synthase (Sanft)
- Dynamics of Frisbee Flight (Kaplan)
- The Maney Force and Satellite Motion (Kaplan)
- Cylindrical Braids and Knots (Peifer)
- Aperiodic Fractal Tiling (McClure)
- Rewriting Systems for Knot Groups (Peifer)
- Pythagorean Magic Squares Triples (Boudreaux)
- Using History of Mathematics to Introduce Topics in K-12 Math Courses (Boudreaux)
- Mathematics and Music (Boudreaux)

Sample Academic Program by Mathematical Concentration

Sem	Subject	Applied	Pure	Licensure	Stats
	Calculus I	MATH 191	MATH 191	MATH 191	MATH 191
	Fr. Colloquium	FYS 178	FYS 178	FYS 178	FYS 178
	Academic Writing	LANG 120	LANG 120	LANG 120	LANG 120
	Foreign Lang ¹ or Elective	For. Lang.	For. Lang.	For. Lang.	For. Lang.
	Total Hours	15	15	15	15
	Calculus II	MATH 192	MATH 192	MATH 192	MATH 192
	Intro Programming²	CSCI 182/183	CSCI 182/183	CSCI 182/183	CSCI 182/183
	Humanities: Ancient World	HUM 124	HUM 124	HUM 124	HUM 124
	Foreign Lang ¹ or Elective	For. Lang.	For. Lang.	For. Lang.	For. Lang.
	Total Hours	15	15	15	15
	Calculus III	MATH 291	MATH 291	MATH 291	MATH 291
	Foundations of Math or Stats	MATH 280	MATH 280	MATH 280	STAT 225
	Humanities: Renaissance World	HUM 214	HUM 214	HUM 214	HUM 214
	Math application outside major ^{3,4} (Alternative sequence)	Check with advisor	PHYS 221 CHEM 132/111	EDUC 210/211	ECON 102 MGMT 130
	Total Hours	14	15	15	15
	Linear Algebra I	MATH 365	MATH 365	MATH 365	MATH 365
	Calculus-Based Statistics	STAT 225	STAT 225*	STAT 225	MATH 280
	Math applications outside major ^{3,4} (Alternative sequence)	Check with advisor	PHYS 222 CHEM 233/145	EDUC 314	ECON 305 MGMT 380
	LAC: Social Science ⁴	See Catalog	See Catalog	PSYC 319	See Catalog
	Elective	Gen Elective	Gen Elective	Gen Elective	Gen Elective
Total Hours	16	17	16	15	

* Course is optional for a Pure Math student; the student may substitute a 300 level mathematics class in its place.

¹ Student can place out of the foreign language by showing proficiency through the second semester.

² This course meets the "scientific perspective" requirement of the LAC.

³ Other options are available depending on the concentration. Check with your advisor for more detail.

⁴ Lab Science and Social Science requirements may meet the *Math application outside major*.

Sample Academic Program by Mathematical Concentration

Sem	Course Name	Applied	Pure	Licensure	Stats	
	Problem Solving	---	---	MATH 380	---	
	Specific Required Math course	MATH 394	MATH 461	MATH 332⁵	STAT 325⁵	
	Math Elective (300+ Level)	MATH Elective	MATH Elective	MATH Elective	MATH Elective	
	Lab Science ⁴ or Elective	See Catalog	Gen. Elective	See Catalog	See Catalog	
	Diversity Intensive	See Catalog	See Catalog	EDUC 346	See Catalog	
	Elective	Gen. Elective	Gen. Elective	Gen. Elective	Gen. Elective	
	Total Hours (max)	16	15	17	16	
	Math course	MATH Elective	MATH 394	MATH Elective	STAT 326⁵	
	Additional Course	Math Application ⁶	Gen. Elective	MATH Elective	Gen. Elective	
	Humanities: Modern World	HUM 324	HUM 324	HUM 324	HUM 324	
	Arts Elective	See Catalog	See Catalog	See Catalog	See Catalog	
	Elective	Gen. Elective	Gen. Elective	Gen. Elective	Gen. Elective	
	Total Hours	16	16	16	16	
		Problem Solving / Seminar	MATH 381	MATH 381	MATH 480	MATH 381
		Senior Level Math Course	MATH 491	MATH 491	MATH 461	STAT 425⁵
		Senior Capstone	HUM 414	HUM 414	HUM 414	HUM 414
Additional Course		Math Application ⁶	Gen. Elective	EDUC 430	Gen. Elective	
Additional Course		Math Application ⁶	Gen. Elective	EDUC 435	Gen. Elective	
Elective		Gen. Elective	Gen. Elective	Gen. Elective	Gen. Elective	
Total Hours		14	14	14	14	
Senior Seminar		MATH 480	MATH 480	---	MATH 480	
Math Sequence		MATH 395 or 452⁷	MATH 366, 462 or 492	Student Teaching EDUC 455 EDUC 456	STAT 426⁵	
Elective (Except Licensure)		Gen. Elective	Gen. Elective		Gen. Elective	
Elective (Except Licensure)		Gen. Elective	Gen. Elective		Gen. Elective	
Elective (Except Licensure)		Gen. Elective	Gen. Elective		Gen. Elective	
Total Hours		14	14	12	14	

⁴ Lab Science and Social Science requirements may meet the *Math application outside major*.

⁵ Courses offered in alternate years.

⁶ The applied concentration requires 15 hours in another discipline. 9 of these credit hours should be at the 300 level.

⁷ Other options are available, including MATH 366, 441, and STAT 425.

Applied
Required for Major
Within Major Department

___ MATH 191	4	___	___
___ MATH 192	4	___	___
___ MATH 280	3	___	___
___ MATH 291	4	___	___
___ MATH 365	3	___	___
___ MATH 381	1	___	___
___ MATH 394	3	___	___
___ MATH 480	2	___	___
___ STAT 225 or 425	4	___	___

___ 9-10 hours chosen from STAT 225 or 300-400 level MATH *or* STAT.

Must include one of MATH 366, MATH 395, MATH 441, MATH 452, or the sequence STAT 425-426.

Required Outside of Major Department

___ CSCI 182 or 183 3 ___

___ 15-17 hours in area of concentration*
 (9 hours must be at the 300-400 level)

*Approved by the department chair

Pure
Required for Major
Within Major Department

___ MATH 191	4	___	___
___ MATH 192	4	___	___
___ MATH 280	3	___	___
___ MATH 291	4	___	___
___ MATH 365	3	___	___
___ MATH 381	1	___	___
___ MATH 394	3	___	___
___ MATH 461	3	___	___
___ MATH 480	2	___	___
___ MATH 491	3	___	___

___ 9-10 hours chosen from STAT 225 or 300-400 level MATH *or* STAT.

Must include one course from MATH 366, MATH 462, MATH 492, or the sequence STAT 425-426

Required Outside of Major Department

___ CSCI 182 or 183 3 ___

___ One of the following sequences:

CHEM 111/132/145/236

ECON 101/102

PHYS 221/222

or 6 hours 300-400 level courses*

*Approved by the department chair

Statistics
Required for Major

Within Major Department

_____ MATH 191	4	_____	_____
_____ MATH 192	4	_____	_____
_____ MATH 280	3	_____	_____
_____ MATH 291	4	_____	_____
_____ MATH 365	3	_____	_____
_____ MATH 365	3	_____	_____
_____ MATH 381	1	_____	_____
_____ MATH 461	3	_____	_____
_____ MATH 480	2	_____	_____
_____ STAT 225	4	_____	_____
_____ STAT 325	3	_____	_____
_____ STAT 326	3	_____	_____
_____ MATH 425	3	_____	_____
_____ MATH 426	3	_____	_____
_____ 3 hours from 300-400 level MATH or STAT			

Required Outside of Major Department

_____ CSCI 182 or 183	3	_____	_____
_____ 6 hours from one Sequence: ACCT 215/ECON306 ECON102/305 MGMT 220/380 300-400 level statistical courses*			
	3	_____	_____
	3	_____	_____

**Recommended Course:
MATH 491**

**Mathematics with Teacher
Licensure (6-9 & 9-12)**
Required for Major

Within Major Department

_____ MATH 191	4	_____	_____
_____ MATH 192	4	_____	_____
_____ MATH 280	3	_____	_____
_____ MATH 291	4	_____	_____
_____ MATH 332	3	_____	_____
_____ MATH 365	3	_____	_____
_____ MATH 381	1	_____	_____
_____ MATH 461	3	_____	_____
_____ MATH 480	2	_____	_____
_____ STAT 225	4	_____	_____
_____ 9 hours from 300-400 Level MATH or STAT			
	3	_____	_____
	3	_____	_____
	3	_____	_____

Required Outside of Major Department

_____ CSCI 182 or 183	3	_____	_____
_____ PSYC 319	3	_____	_____

Teacher Licensure

_____ EDUC 210	3	_____	_____
_____ EDUC 211	1	_____	_____
_____ EDUC 314	3	_____	_____
_____ EDUC 320*	3	_____	_____
_____ EDUC 346	3	_____	_____
_____ EDUC 430	3	_____	_____
_____ EDUC 435	2	_____	_____
_____ EDUC 455	8	_____	_____
_____ EDUC 456	4	_____	_____

*6-9 Licensure only

Liberal Arts Core Requirements - Summary and Checklist

Done	Requirement	Hours	Courses
	First-Year Colloquium	3-4	LA 178 or DEPT 178
	Academic Writing and Critical Inquiry	4	LANG 120
	Humanities (3 courses)	4	HUM 124
		4	HUM 214
		4	HUM 324
	Laboratory Science (do not use the same course to fulfill both the Laboratory Science and the Scientific Perspectives requirements)	4	ASTR 102+112 or 113 ASTR 103+112 or 113 ATMS 111+113 BIOL 125+126, 136, 223 CHEM 109, 111+132, 145+231, 145+233, 222+232 ENVR 105 HWP 295 PHYS 101+121, 102+122, 131, 221 PSYC 362
	Scientific Perspectives (do not use the same course to fulfill both the Laboratory Science and the Scientific Perspectives requirements)	3-4	ASTR 102, 103 ATMS 103, 113 BIOL 107, 108, 110, 125, 135, 136 CHEM 109, 132, 323 CSCI 107, 182, 183, 185 EDUC 322 ENVR 106, 130 HWP 225, 420 JEM 484 PHIL 307 PHYS 101, 102, 131, 221 POLS 396 SOC 362
	Quantitative Perspective	4	MATH or STAT—any 4-hour course
	Social Science	3-4	Any 3-4 credit course with the following prefixes: ANTH, ECON, POLS, PSYC, SOC AFST 130, 364, 433 ASIA 100, 320, 330 EDUC 210 ESI 101 HWP 250, 333 INTS 201, 301, 320, 330 MCOM 104 MGMT 300, 360, 398 WGSS 100
	Second Language (proficiency through the 2 nd semester)	0-4	ASIA 102 CLAS 102, 104, 106 FREN 120 or 130 GERM 120 or 130 PORT 120 SPAN 130 WLNG 120
	Arts and Ideas	3-4	ARTS 310 or 3 hours of course work designated as ARTS
	Senior Capstone	4	HUM 414 or LA 478
	Diversity Intensive	3-4	A course from across the curriculum designated as DI
	Information Literacy Competency	0	Information Literacy Competency fulfilled in the major
	Writing Competency	0	Writing competency fulfilled in the major

LIST OF COURSE OFFERINGS IN MATHEMATICS

The following is a list of courses that the department regularly offers over two years. Faculty teaches special topic courses, software training, internships, and undergraduate research periodically. Courses included in every concentration are in bold. For a complete description, check your catalog.

MATH 155	Nature of Mathematics	(F&S)
MATH 167	Precalculus	(F&S)
MATH 191	Calculus I	(F&S)
MATH 192	Calculus II	(F&S)
MATH 211	Structure of Math I	(F)
MATH 215	Structure of Math II	(S)
MATH 251	Discrete Mathematics	(S)
MATH 280	Introduction to Foundations of Mathematics	(F & S)
MATH 291	Calculus III	(F & S)
MATH 303	History of Math	(S-even)
MATH 332	Geometry	(F-odd)
MATH 365	Linear Algebra I	(F & S)
MATH 366	Linear Algebra II	(S-even)
MATH 368	Number Theory	(S-odd)
MATH 381	Problems in Mathematics	(F)
MATH 391	Advanced Calculus	(S-even)
MATH 394	Differential Equations	(F & S)
MATH 395	Partial Differential Equations	(S-odd)
MATH 397	Chaos and Fractals	(F-odd)
MATH 398	Complex Variables	(F-even)
MATH 431	Topology	(S-even)
MATH 441	Numerical Analysis (CSCI 441)	(S-odd)
MATH 452	Introduction to Mathematical Models	(S-even)
MATH 461	Abstract Algebra I	(F)
MATH 462	Abstract Algebra II	(S-odd)
MATH 480	Senior Seminar	(F & S)
MATH 491	Analysis I	(F)
MATH 492	Analysis II	(S-even)
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STAT 185	Introductory Statistics	(F&S)
STAT 220	Introduction to Applied Probability	(F)
STAT 225	Introduction to Calculus-Based Statistics	(F & S)
STAT 321	Applied Data Analysis	(F-even)
STAT 325	Introduction to Regression Models	(F-odd)
STAT 326	Statistics for Experimenters	(S-even)
STAT 327	Applied Multivariate Analysis	(S-odd)
STAT 329	Big Data Analytics	(S-even)
STAT 425	Introduction to Probability Theory	(F-even)
STAT 426	Introduction to Mathematical Statistics	(S-odd)

CAREERS IN MATHEMATICS AND STATISTICS

The University of North Carolina Asheville is a school that strives toward giving the student the best possible liberal education. Mathematics is one of the traditional liberal arts. The department does not train for particular jobs or professions but instead equips graduates with the problem-solving and analytical thinking skills necessary for a wide range of careers. There are boundless opportunities for a mathematics major when the undergraduate combines her or his mathematics background with a specialty in an applied field and more advanced graduate-level training.

Each year about one-third of the UNC Asheville mathematics graduates become teachers—about a third go on to graduate school, and about a third seek employment in industry and government. The following list gives examples of the types of professions some of our graduates have pursued.

Professions of Former UNC Asheville Mathematics Majors

Actuarial Scientist	International Project Manager
Assistant Professor of Agronomy	Market Analyst
Biomedical Technician/ Statistician	Product Planner
Business Systems Manager	Quality Processor
Computer Analyst	Small Business Owner
Computer Systems Manager	Software Engineer
Emergency Planner	Systems Analyst

In the past, mathematics majors found employment in banks, computer companies, telephone or power companies, government, medicine, and the military. There is no specific training in today's highly technological and ever-changing world, which will guarantee you a job. Many companies look for a workforce with diverse educational backgrounds and are interested in people whose expertise is mathematics.

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