

## MATHEMATICS (MA)

The Department of Mathematics offers two tracks for its majors. The track leading to the Bachelor of Science degree with a minimum 18-hour minor will prepare the graduate for scientific endeavors requiring detailed and exact scientific analysis. The licensure/certification track which includes a 33-hour Education minor will prepare the student for a rewarding career as a high school and/or middle school mathematics teacher. A mathematics major combined with a Computer Science minor will open many career opportunities for the graduate.

### Bachelor of Science - Mathematics Major (Track 1)

**MAJOR CODE: 27.0101**

Program components for the Bachelor of Science degree with a major in Mathematics include:

1. **APPLICABLE GENERAL UNIVERSITY REQUIREMENTS:**

**To graduate, each student must:**

- complete a minimum of 33 semester hours of the last 39 semester hours at ASU.
- complete 60 to 64 semester hours of upper level college/university credit (300-400 level courses).
- complete a minimum of 15 semester hours of upper (300/400) level coursework in his or her major at Athens State University, not including courses taken by consortium arrangement. School or departmental regulations may require more than 15 semester hours of coursework in the major at Athens State University.
- complete all course requirements for major(s).
- complete all course requirements for minor (if applicable).
- complete all of the general education requirements for the degree.
- attain an overall grade point average of 2.0, a 2.0 on all coursework attempted at Athens State University and at least a 2.0 in the major field. School or departmental regulations may require more than a 2.0 grade point average (see major requirements in each discipline).
- complete the total hour requirement as specified by the degree.
- complete the teacher certification requirements (if applicable).

***EACH STUDENT MUST ASSUME RESPONSIBILITY FOR KNOWING THE ACADEMIC REQUIREMENTS FOR THE DEGREE THAT IS BEING PURSUED.***

2. **GENERAL EDUCATION REQUIREMENTS:**

<b>Area I. Written Composition</b> .....	6 semester hours	___ ___
<b>Area II. Humanities/Fine Arts (12 semester hours)</b>		
<b>At least one</b> fine arts course .....	3 semester hours	___
<b>At least one</b> literature course .....	3 semester hours	___
Additional Humanities/Fine Arts courses .....	6 semester hours	___ ___
<b>Area III. Mathematics and Natural Sciences (11 semester hours)</b>		
Precalculus Algebra .....	3 semester hours	___
Calculus Based Physics I .....	4 semester hours	___
Calculus Based Physics II .....	4 semester hours	___
<b>Area IV. History/Behavioral and Social Sciences (12 semester hours)</b>		
<b>At least one</b> history course .....	3 semester hours	___
Additional History/Behavioral and Social Science Courses .....	9 semester hours	___ ___ ___
<b><u>TOTAL GENERAL EDUCATION REQUIREMENTS</u></b> .....	<b>41 SEMESTER HOURS</b>	

3. **MAJOR PREREQUISITE COURSES (PREPROFESSIONAL)**

Students planning to major in mathematics at Athens State University are required to complete the following courses:

CIS 146 Microcomputer Application <u>or</u>	
CS 301 Problem Solving With Computers .....	3 semester hours ___
Precalculus Trigonometry .....	3 semester hours ___
Calculus Sequence .....	12 semester hours ___ ___ ___
General Electives .....	1-5 semester hours ___ ___

**TOTAL MAJOR PREREQUISITE HOURS: ..... 19-23 SEMESTER HOURS**

**TOTAL GEN. ED. REQ. & MAJOR PREREQUISITE HOURS: ..... 60-64 SEMESTER HOURS**

4. **PROFESSIONAL COURSES:**

MA 308 Discrete Mathematics .....	3 semester hours ___
MA 310 Matrices and Linear Algebra or its equivalent .....	3 semester hours ___
MA 320 Modern Algebra .....	3 semester hours ___
MA 330 Advanced Mathematical Software .....	3 semester hours ___
MA 421 Differential Equations .....	3 semester hours ___
MA 431 Introduction to Probability .....	3 semester hours ___
Computer Programming Language Sequence (preferably CS 317, CS 318) .....	6 semester hours ___ ___

**Plus THREE (3) mathematics electives from the following: ..... 9 semester hours \_\_\_ \_\_\_ \_\_\_**

- MA 316 Vector Analysis
- MA 401 Complex Analysis\*
- MA 423 Numerical Analysis
- MA 428 Partial Differential Equations
- MA 432 Introduction to Statistics
- MA 441 Special Topics in Mathematics\*\*
- MA 445 Mathematical Modeling and Simulation
- MA 450 Advanced Calculus I\*
- MA 451 Advanced Calculus II\*
- MA 452 Real Analysis\*

**Additionally, at least ONE 2-SEMESTER SEQUENCE must be completed for the Mathematics Major.**

**Options are:**

- MA 421 Differential Equations and MA 428 Partial Differential Equations or
- MA 431 Introduction to Probability and MA 432 Introduction to Statistics or
- MA 450 Advanced Calculus I and MA 451 Advanced Calculus II

**TOTAL PROFESSIONAL HOURS: ..... 33 SEMESTER HOURS**

\*Recommended if planning to attend graduate school.

\*\*Must be approved by Mathematics Department Chairperson.

5. **The Mathematics major must complete a minimum of 12 semester hours of upper division 300/400 level mathematics coursework at Athens State University. To be used toward completing a Mathematics major at Athens State, any mathematics course transferred to Athens State must be a grade of C or higher. Mathematics majors must maintain a 2.5 G.P.A. in mathematics courses taken at Athens State University.**

6. A minimum 18 semester hour MINOR is required and must be approved by a Mathematics faculty advisor. .... **18 semester hours**

7. **GENERAL ELECTIVES ..... 13 semester hours**

8. **TOTAL HOURS FOR GRADUATION ..... 124-128 SEMESTER HOURS**

9. **ASSESSMENT/EXIT EXAMS**

Assessment exams and an exit exam are required. For most mathematics courses, the instructor will administer an assessment exam. The Coordinator of Testing administers the exit exam. The student should contact the Testing Office in the Student Center for policies, procedures, and times for the exam. It is the student's responsibility to schedule and take the exit exam. It is suggested that the exit exam be taken during the term prior to the student's last semester. As a condition for graduation, all B.S. mathematics majors must satisfactorily complete an exit exam. The B.S. mathematics/18 hours minor exit exam covers topics and problems from algebra, trigonometry, the calculus sequence, discrete mathematics, linear algebra, modern algebra, differential equations, and introduction to probability.

## Mathematics Minor

A minor in Mathematics requires 24 semester hours of mathematics including 9 semester hours of upper division coursework, at least 9 semester hours of which must be taken at Athens State University. The following courses must be included:

Calculus Sequence .....	12 semester hours
MA 310 Linear Algebra .....	3 semester hours
MA 421 Differential Equations .....	3 semester hours
Upper Division Mathematics Electives (Approved Mathematics courses above the calculus sequence) .	6 semester hours
<b>TOTAL HOURS FOR MINOR .....</b>	<b>24 semester hours</b>

**Bachelor of Science - Mathematics Major (Track 2)**  
**(Licensure and Certification Track for Teaching in Secondary Education) (Grades 6-12)**  
**MAJOR CODE: 27.0101**

**(Due to the No Child Left Behind Federal Act of 2001, the program listed below may have changed. See your advisor.)**

**NOTE: To teach in secondary schools, the students MUST:**

- 1) complete the below listed requirements to include the minor for certification and licensure;
- 2) contact the certification officer in the College of Education for approval of appropriate professional education courses and compliance with NCLB Federal Act of 2001 and State Department of Education licensure standards;
- 3) maintain a grade point average of at least a 2.75 on a 4.0 scale in each of the following: professional education, teaching field, and overall education. This is a requirement for student teaching and for graduation.
- 4) repeat courses in which D's and F's are made and realize that all attempts are calculated in the GPA. Education courses with the prefixes may be repeated one time only ED, EL, ER, SC, SE, CE, and HPE; and
- 5) understand that underlined courses in the minor require admission into the Teacher Education Program (TEP).

**1. APPLICABLE GENERAL UNIVERSITY REQUIREMENTS:**

**To graduate, each student must:**

- complete a minimum of 33 semester hours of the last 39 semester hours at ASU.
- complete 60 to 64 semester hours of upper level college/university credit (300-400 level courses).
- complete a minimum of 15 semester hours of upper (300/400) level coursework in his or her major at Athens State University, not including courses taken by consortium arrangement. School or departmental regulations may require more than 15 semester hours of coursework in the major at Athens State University.
- complete all course requirements for major(s).
- complete all course requirements for minor (if applicable).
- complete all of the general education requirements for the degree.
- complete the total hour requirement as specified by the degree.
- complete the teacher certification requirements (if applicable).

***EACH STUDENT MUST ASSUME RESPONSIBILITY FOR KNOWING THE ACADEMIC REQUIREMENTS FOR THE DEGREE THAT IS BEING PURSUED. PLEASE FOLLOW CAREFULLY.***

**2. GENERAL EDUCATION REQUIREMENTS:**

<b>Area I.</b>	Written Composition .....	6 semester hours	__	__
<b>Area II.</b>	<b>Humanities/Fine Arts (12 semester hours)</b>			
	At least one fine arts course .....	3 semester hours	__	
	Literature* .....	3 semester hours	__	or
	Speech (SPH 106 or SPH 107) .....	3 semester hours	__	
	Humanities/Fine Arts Elective .....	0 semester hours	__	or
		3 semester hours	__	
<b>Area III.</b>	<b>Mathematics and Natural Sciences (11 semester hours)</b>			
	Precalculus Algebra .....	3 semester hours	__	
	Calculus Based Physics I .....	4 semester hours	__	
	Calculus Based Physics II .....	4 semester hours	__	
<b>Area IV.</b>	<b>History/Behavioral and Social Sciences (12 semester hours)</b>			
	History* .....	3 semester hours	__	or
	General Psychology .....	3 semester hours	__	
	History/Behavioral or Social Science			
	Elective .....	3 semester hours	__	or
		6 semester hours	__	

**\*Students must complete a 6 semester hour sequence in either Area II Literature or Area IV History.**

**TOTAL GENERAL EDUCATION REQUIREMENTS ..... 41 SEMESTER HOURS**

**3. MAJOR PREREQUISITE COURSES (PRE-PROFESSIONAL):**

CIS 146 Microcomputer Applications <u>or</u>		
CS 301 Problem Solving with Computers .....	3 semester hours	___
Precalculus Trigonometry .....	3 semester hours	___
Calculus Sequence .....	12 semester hours	___ ___
		___ ___
General Electives .....	1-5 semester hours	___ ___

**TOTAL PRE-PROFESSIONAL HOURS: ..... 19-23 SEMESTER HOURS**

**TOTAL GEN. ED. REQ. AND MAJOR PREREQUISITE HOURS: ..... 60-64 SEMESTER HOURS**

**4. PROFESSIONAL COURSES:**

MA 308 Discrete Mathematics .....	3 semester hours	___
MA 310 Matrices and Linear Algebra or its equivalent .....	3 semester hours	___
MA 314 College Geometry** .....	3 semester hours	___
MA 330 Advanced Mathematical Software .....	3 semester hours	___
MA 331 Applied Probability and Statistics .....	3 semester hours	___
MA 441 Special Topics in Mathematics .....	3 semester hours	___
Computer Programming Language, CS 317 Computer Science I (C++), or its equivalent .....	3 semester hours	___

Plus FOUR (4) Mathematics Electives from the following: ..... 12 semester hours \_\_\_ \_\_\_

- MA 316 Vector Analysis \_\_\_\_\_
- MA 320 Modern Algebra\* \_\_\_\_\_
- MA 401 Complex Analysis \_\_\_\_\_
- MA 421 Differential Equations \_\_\_\_\_
- MA 423 Numerical Analysis \_\_\_\_\_
- MA 428 Partial Differential Equations \_\_\_\_\_
- MA 431 Introduction to Probability \_\_\_\_\_
- MA 432 Introduction to Statistics \_\_\_\_\_
- MA 445 Mathematical Modeling and Simulation \_\_\_\_\_
- MA 450 Advanced Calculus I \_\_\_\_\_
- MA 451 Advanced Calculus II \_\_\_\_\_
- MA 452 Real Analysis\* \_\_\_\_\_

\*Recommended if planning to attend graduate school.

\*\*Prerequisite for MA 454 Materials and Methods of Teaching Mathematics in Middle School/High School.

**TOTAL PROFESSIONAL COURSE HOURS ..... 33 SEMESTER HOURS**

**5. MINOR COURSES FOR CERTIFICATION:**

ED 301 Foundations of Education I .....	1 semester hour	___
ED 302 Foundations of Education II .....	2 semester hours	___
ED 305 Technology & Media in Education .....	3 semester hours	___
SC 331 Issues and Management in Secondary Education .....	3 semester hours	___
SC 333 <u>Teaching Reading/Writing in the Content Areas</u> .....	3 semester hours	___
SE 301 Introduction to Exceptional Learners .....	3 semester hours	___
PS 334 <u>Adolescent Psychology</u> .....	3 semester hours	___
SC 362 <u>Assessment and Evaluation in Secondary Education</u> .....	3 semester hours	___
MA 454 <u>Materials and Methods of Teaching Mathematics in Middle School/High School</u> .....	3 semester hours	___
SC 486 <u>Internship in High School Education</u> .....	9 semester hours	___ ___ ___

**TOTAL MINOR REQ. FOR LICENSURE/CERTIFICATION: ..... 33 SEMESTER HOURS**

**6. General Electives ..... 3-6 semester hours**

**TOTAL HOURS FOR GRADUATION ..... 129-136 SEMESTER HOURS**

7. For the student obtaining high school certification who wishes a middle school endorsement in **mathematics (Grades 4-8)**, the following courses are required:

EL 424 Teaching Mathematics in Intermediate Grades .....	3 semester hours
EL 413 Teaching Reading in the Intermediate Grades .....	3 semester hours
PS 332 Child Psychology .....	3 semester hours

**NOTE: IF THE FOURTEEN-WEEK INTERNSHIP WAS NOT COMPLETED IN GRADES 7-8, AN ADDITIONAL SEVEN-WEEK INTERNSHIP MUST BE COMPLETED IN MIDDLE SCHOOL GRADES.**

8. **ASSESSMENT/EXIT EXAMS**

Assessment exams and an exit exam are required. For most mathematics courses, the instructor will administer an assessment exam. The Coordinator of Testing administers the exit exam. The student should contact the Testing Office in the Student Center for policies, procedures, and times for the exam. It is the student's responsibility to schedule and take the exit exam. It is suggested that the exit exam be taken during the term prior to the student's last semester. The exit exam for the B.S. mathematics/education minor covers topics and problems from algebra, trigonometry, the calculus sequence, discrete mathematics, linear algebra, college geometry, applied probability and statistics, and special topics.