

# Bachelor of Science Mathematics with a Major in Secondary Mathematics Education (6-12) (BS)

## Bachelor of Science in Mathematics with Teaching Licensure

Due to changing University requirements, national accreditation standards, and the Virginia Board of Education licensure regulations, the teacher preparation programs in the College of Sciences are under constant revision. Any changes resulting from these factors supersede the program requirements described in this Catalog. Students are encouraged to obtain current program information from their advisors and the Office of Clinical Experiences website at [www.odu.edu/oce](http://www.odu.edu/oce) (<http://www.odu.edu/oce/>).

### Admission

Students must first declare mathematics with a major in secondary mathematics education (6-12) with the mathematics departmental advisor. All students must apply for and be admitted into the approved secondary mathematics education major. Students must meet the required criteria for admission by earning the minimum required grade point averages (GPA).

### Virginia Board of Education Prescribed Assessments for Admission to an Approved Teacher Education Program

Old Dominion University students seeking admission to an approved teacher education program must satisfy the Virginia Board of Education required assessment for admission into an approved teacher education program. The requirement can be satisfied by meeting a passing score in the following:

- Virginia Communication and Literacy Assessment (VCLA): Scaled passing score of 235 for the reading subtest and score of 235 for the writing subtest OR a composite score of 470 for the assessment.

For the most current information on the prescribed Virginia Board of Education admission assessment, visit the Virginia Department of Education at <https://www.doe.virginia.gov/>.

### Required grade point averages (GPA)

- A cumulative GPA of 2.75 is required.
- A major/content GPA of 2.75 is required. The mathematics core must be successfully completed. A grade of C+ or higher is required in MATH 211 and MATH 212, and a cumulative GPA of 2.3 or higher is required in all 300 and 400 level core courses with no grade lower than C. No grade lower than C- is accepted for the remaining math courses.
- A professional education GPA of 2.75 is required. All professional education courses must be passed with a grade of C- or higher.

Although students may enroll in a limited number of education courses, students must be admitted into the approved mathematics teacher preparation program prior to enrolling in any instructional strategies practicum education course. Students must also meet with an education advisor in the MonarchTeach Office.

### Continuance

Students must maintain a cumulative GPA of 2.75, a major/content GPA of 2.75 and a professional education GPA of 2.75. The mathematics core must be successfully completed. A grade of C+ or higher is required in MATH 211 and MATH 212, and a cumulative GPA of 2.3 or higher is required in all 300 and 400 level mathematics core courses with no grade

lower than a C. The remaining courses required for the major and in the professional education core must be completed with a grade of C- or higher for continuance. A professional education GPA of 2.75 is required for continuance. Students must take and pass the Praxis Subject Assessment, Mathematics content knowledge (formerly Praxis II) prior to or while enrolled in the instructional strategies course. All assessments must be passed prior to the start of the Teacher Candidate Internship Orientation session.

### Background Clearance Requirement

Old Dominion University requires a background clearance check of candidates interested in many of the professional education programs. Professional education programs have several field experiences that are required for continuance and graduation from the program. The background clearance must be successfully completed prior to a field experience placement. Candidates will be provided a field experience placement when the background check process is completed with resolution of any issues. The process to complete the ODU clearance background check is located at: <http://www.odu.edu/success/academic/teacher-education/placement/background-checks> (<http://www.odu.edu/success/academic/teacher-education/placement/background-checks/>). The ODU clearance process includes: an FBI fingerprint, a child protective service/social service review, and a Virginia State Police sex offender registry review. Candidates interested in the professional education programs are advised to complete this clearance process immediately upon entry into the program since the clearance process takes a minimum of eight weeks to complete.

### Virginia Board of Education Prescribed Assessments for Licensure

Praxis Subject Assessment, Mathematics content knowledge (formerly Praxis II). Test code: 5161 – passing score of 160 is required.

To review more information on the Virginia Board of Education prescribed assessments visit the Office of Clinical Experiences website, [www.odu.edu/oce](http://www.odu.edu/oce) (<http://www.odu.edu/oce/>).

## Requirements

### Lower-Division General Education

Written Communication ( <a href="http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#written">http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#written</a> )	6
Oral Communication ( <a href="http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#oral">http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#oral</a> )	3
Mathematics ( <a href="http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#math">http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#math</a> )	3
Language and Culture ( <a href="http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#language">http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#language</a> )	0-6
Information Literacy and Research ( <a href="http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#information">http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#information</a> )	3
Human Behavior ( <a href="http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#behavior">http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#behavior</a> )	3
Human Creativity ( <a href="http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#creativity">http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#creativity</a> )	3
Interpreting the Past ( <a href="http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#interpret">http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#interpret</a> )	3
Literature ( <a href="http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#literature">http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#literature</a> )	3
Philosophy and Ethics ( <a href="http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#philosophy">http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#philosophy</a> )	3
The Nature of Science ( <a href="http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#nature">http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#nature</a> )	8
Impact of Technology ( <a href="http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#impact">http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#impact</a> )	3

Written Communication: A grade of C or better is required in both courses.

Mathematics: met in the major by MATH 211

Information Literacy and Research: CS 121G (preferred)

Philosophy and Ethics: PHIL 120P recommended

The Nature of Science: The eight credit hours of Nature of Science with labs need not be in the same science.

## Upper-Division General Education

The professional education core satisfies the Upper-Division General Education requirement.

### Requirements for Graduation

Requirements for graduation with a BS in Mathematics with Teaching Licensure include completion of ENGL 110C and ENGL 211C or ENGL 231C with a grade of C or better, completion of the Senior Assessment, a minimum cumulative 2.75 GPA, in the major area, and in the professional education core, successful completion of the mathematics core, no grade less than C- in the remaining courses in the major and the professional education core, successful completion of the Apprentice Teaching, and a minimum of 120 credit hours to include a minimum of 30 credit hours overall and 12 credit hours in upper-level courses in the major program from Old Dominion University. Successful completion of the core requires a grade of C+ or higher in MATH 211 and MATH 212, and a cumulative GPA of 2.3 or higher is required in all 300 and 400 level mathematics core courses with no grade lower than a C.

Licensure requirements also include certificate of completion in First Aid/AED/CPR, Dyslexia Awareness Training, Child Abuse and Neglect Recognition and Intervention Training, and Regulations Governing the Use of Restraint and Seclusion in Elementary and Secondary Schools, and Cultural Competence Training.

## Mathematics Core

### Mathematics Core Course Requirements \*

CS 151 or CS 153	Introduction to Programming with Java Introduction to Programming with Python	4
MATH 211	Calculus I	4
MATH 212	Calculus II	4
MATH 307	Ordinary Differential Equations	3
MATH 311W	Abstract Algebra	3
MATH 312	Calculus III	4
MATH 316	Introductory Linear Algebra	3
MATH 317	Calculus IV: Introductory Analysis	3
STAT 310	Introductory Data Analysis	3
STAT 330 or STAT 331	An Introduction to Probability and Statistics Theory of Probability	3
<b>Total Credit Hours</b>		<b>34</b>

\* A grade of C+ or higher is required in MATH 211 and MATH 212. A cumulative GPA of 2.3 or higher is required in all 300 and 400 level core courses with no grade lower than a C. In addition, a grade of C or higher is required in mathematics and statistics prerequisite courses to advance to the next course.

## Professional Education Core

STEM 101	Step 1 – Inquiry Approaches to Teaching STEM	1
STEM 102	Step 2 - Inquiry Based STEM Lesson Design	1
STEM 201	Knowing and Learning in STEM Education	3
STEM 202	Classroom Interactions in STEM Education	3
STEM 401	Project Based Instruction in STEM Education	3
STEM 402	Perspectives on STEM	3
STEM 485	Apprentice Teaching	9
SCI 468	Research Methods in Math and Sciences	3

(Satisfied by BIOL 468W, CHEM 468, OEAS 468W, or PHYS 468W)

**Total Credit Hours** **26**

## Secondary Mathematics Education (6-12) Major

### General Education

Complete lower-division requirements 38-44

Complete upper-division requirements (satisfied by the professional education core)

### Mathematics Core

Complete mathematics core requirements 34

### Professional Education Core

Complete professional education core requirements 26

### Secondary Mathematics Education Major \*\*

MATH 375	Advanced Concepts for Secondary Educators: Function and Modeling	3
MATH 400	History of Mathematics	3
MATH 404	Fundamental Concepts of Geometry	3
MATH 406	Number Theory and Discrete Mathematics	3
MATH 417 or MATH 422	Intermediate Real Analysis I Applied Complex Variables	3
MATH 400-level electives (or approved BDA courses)		6
<b>Total Credit Hours</b>		<b>119-125</b>

\*\* A C- or higher is required in all Secondary Mathematics Education courses.

## Degree Program Guide

The Degree Program Guide is a suggested curriculum to complete this degree program in four years. It is just one of several plans that will work and is presented only as broad guidance to students. Each student is strongly encouraged to develop a customized plan in consultation with their academic advisor. Additional information can also be found in Degree Works.

Course	Title	Credit Hours
<b>Freshman</b>		
<b>Fall</b>		
ENGL 110C	English Composition (Grade of C or better required)	3
MATH 211	Calculus I	4
Human Behavior		3
Information Literacy and Research (CS 121G preferred)		3
STEM 101	Step 1 – Inquiry Approaches to Teaching STEM	1
<b>Credit Hours</b>		<b>14</b>
<b>Spring</b>		
Select one of the following:		
ENGL 211C	Writing, Rhetoric, and Research	
ENGL 231C	Writing, Rhetoric, and Research: Special Topics	
MATH 212	Calculus II	4
Oral Communication		3
Philosophy and Ethics (PHIL 120P recommended)		3
STEM 102	Step 2 - Inquiry Based STEM Lesson Design	1
<b>Credit Hours</b>		<b>14</b>

**Sophomore****Fall**

MATH 307	Ordinary Differential Equations	3
Human Creativity		3
CS 151 or CS 153	Introduction to Programming with Java or Introduction to Programming with Python	4
Nature of Science I		4
STEM 201	Knowing and Learning in STEM Education	3
<b>Credit Hours</b>		<b>17</b>

**Spring**

MATH 312	Calculus III	4
Interpreting the Past		3
Literature		3
Nature of Science II		4
STEM 202	Classroom Interactions in STEM Education	3
<b>Credit Hours</b>		<b>17</b>

**Junior****Fall**

MATH 311W	Abstract Algebra (C or better required)	3
MATH 317	Calculus IV: Introductory Analysis	3
MATH 375	Advanced Concepts for Secondary Educators: Function and Modeling	3
STAT 330 or STAT 331		3
MATH 400-level elective (or approved BDA course)		3
Elective		1
<b>Credit Hours</b>		<b>16</b>

**Spring**

MATH 316	Introductory Linear Algebra	3
MATH 400	History of Mathematics	3
MATH 404	Fundamental Concepts of Geometry	3
STAT 310 or STAT 431		
SCI 468	Research Methods in Math and Sciences (Satisfied by BIOL 468W, CHEM 468, OEAS 468W or PHYS 468W))	3
Impact of Technology		3
<b>Credit Hours</b>		<b>15</b>

**Senior****Fall**

MATH 406	Number Theory and Discrete Mathematics	3
MATH 417 or MATH 422		3
STAT 310 or STAT 431		3
MATH 400-level elective (or approved BDA course)		3
STEM 401	Project Based Instruction in STEM Education	3
<b>Credit Hours</b>		<b>15</b>

**Spring**

STEM 402	Perspectives on STEM	3
STEM 485	Apprentice Teaching	9
<b>Credit Hours</b>		<b>12</b>
<b>Total Credit Hours</b>		<b>120</b>

Language and Culture I & II may be met in high school and are not included in this four-year plan. Please see requirement details.

## Linked Bachelor of Science in Mathematics and Master of Science in Computational and Applied Mathematics

The linked program allows students to count up to 12 credits of graduate coursework toward both their undergraduate and master's degrees. Students must earn a minimum of 150 credits (120 discrete credit hours for the undergraduate degree and 30 discrete credit hours for the graduate degree).

### Admission

To be admitted to the linked program, students must have completed at least 60 undergraduate credit hours with at least 24 credit hours from ODU. Students must have completed MATH 307, MATH 312, MATH 317 and all prerequisites for those courses. At the time of admission, they must have an overall GPA of 3.00 or better and a GPA of 3.00 or better in MATH and STAT courses.

Interested students who meet the admission requirements should apply to the graduate program director, after consulting with the undergraduate chief departmental advisor, as soon as possible upon completing the required courses and 60 credit hours. In consultation with the graduate program director, a student will:

1. Officially declare an undergraduate Mathematics major with the undergraduate chief departmental advisor.
2. Draft a schedule of graduate courses to be taken as an undergraduate to be presented to the undergraduate chief departmental advisor.
3. Apply, during their senior year, to the Office of Graduate Admissions for admission to the master's in computational and applied mathematics program.

Students who have completed at least six hours of graduate courses upon attaining senior standing (completion of 90 credit hours) and who have earned a GPA of 3.00 or better in those courses will not be required to take the Graduate Record Exam (GRE) for admission to the master's program. Otherwise, in keeping with normal admission requirements for the MS in computational and applied mathematics, students will take the GRE as an undergraduate and will subsequently be reevaluated for continuation into the master's program.

Once students have been awarded their bachelor's degree and fulfilled all regular admission requirements for the MS in computational and applied mathematics, they will be officially admitted into the MS program.

### Program Requirements

Students in the program will fulfill all normal admission and curricular requirements for both a BS in mathematics and an MS in computational and applied mathematics with the following exceptions:

1. Students in the program may count up to 12 hours of 500 or 600 level graduate courses, excluding independent study, taken as an undergraduate for which they have earned a grade point average of 3.0 or greater with no course grade lower than a B- toward both the BS in mathematics and the MS in computational and applied mathematics.
2. Students in the program may substitute mathematics or statistics graduate courses for undergraduate courses according to the following schema. All students must complete an undergraduate writing intensive course in the major.
  - a. All students must complete the prescribed undergraduate program including all 400-level required courses and electives.

- b. All students may substitute 500- and 600-level courses for the remaining credit hours in the 120-hour requirement in the undergraduate program so long as they have the prerequisites for those courses. 700- or 800-level courses may not be used.
- c. Students will not receive credit for both the 400 and 500 level version of the same course.
- d. Students in the program may make a written petition for other substitutions to the graduate program director, who will consider them in consultation with the chief departmental advisor and the instructor(s) of the courses involved.

NOTES:

- 1. In accordance with University policy, up to 21 hours of graduate courses taken as an undergraduate may be counted toward the bachelor's degree; however, only 12 hours of graduate courses taken as an undergraduate may also be counted toward the MS degree. This will limit students' scheduling flexibility subsequently.

## **BA or BS to MBA (Master of Business Administration) Linked Program**

The linked BA/MBA or BS/MBA program is an early entry to the MBA program of study. The early-entry program is designed for well qualified non-business undergraduate ODU students to start their MBA program prior to completing their undergraduate degree. Well qualified non-business undergraduate students may take MBA-level courses as early as three semesters prior to graduation and count up to 12 graduate credits toward their undergraduate degree. Students participating in the early-entry program must earn a minimum of 150 credit hours (120 discrete credit hours for the undergraduate degree and 30 discrete credit hours for the graduate degree). Early-entry program students should carefully consider their undergraduate degree program requirements when planning their course of study. Students in the early-entry program work in close consultation with the MBA Program Office and should refer to information in the Strome College of Business section in the graduate catalog (<http://catalog.odu.edu/graduate/stromecollegeofbusiness/>) to develop an individualized plan of study based on the required coursework.

## **BA or BS to MPA (Master of Public Administration) Linked Program**

The linked BA/MPA or BS/MPA program provides qualified Old Dominion University undergraduate students with the opportunity to earn a master's degree in public administration while taking credits in the MPA program as an undergraduate student. The program is designed for highly motivated students with the desire to immediately continue their education after the bachelor's degree. The program is especially relevant to individuals seeking to work (or currently working) in the public or non-profit sectors, but is suitable for students from any undergraduate major. Graduate courses may be taken during the fall and spring semester of the student's senior undergraduate year. Up to 12 graduate credits can count toward both the undergraduate and graduate degree and can meet upper-level General Education requirements. After receiving the undergraduate degree, a student will continue with the MPA program, taking MPA courses until completing the required 39 credit hours. Students in the linked program must earn a minimum of 150 credit hours (120 discrete credit hours for the undergraduate degree and 30 discrete credit hours for the graduate degree).

Requirements for admission to the graduate program can be found in the School of Public Service section of the Graduate Catalog (<http://catalog.odu.edu/graduate/business/public-service/>). For additional information, please contact the School of Public Service in the Strome College of Business.