

2009-2010

B.A.Ed. in Chemistry/Mathematics- Secondary

College of Sciences and Technology
Woodring College of Education

What Is the Chemistry/Mathematics Secondary Major?

The program of study for the chemistry/mathematics majors provides many benefits to students, such as close student-faculty contact and relatively small classes. The students have direct access to modern laboratory equipment and instrumentation, and there are opportunities for research work under the direction of a faculty advisor.

As a practical matter, Mathematics is a science of pattern and order. Its domain is not molecules or cells, but numbers, chance, form, algorithms, and change. As a science of abstract objects, Mathematics relies on logic rather than on observation as its standard of truth, yet employs observation, simulation, and even experimentation as means of discovering truth."

-From *Everybody Counts: A Report to the Nation on the Future of Mathematics Education* (c) 1989 National Academy of Sciences.

Why Should I Consider This Major?

Teaching mathematics and chemistry is a challenge, a responsibility, and an opportunity. Learning to teach mathematics and chemistry occurs through a variety of means: the study of a wide variety of mathematics and chemistry, pedagogical preparation within a mathematical and science context, formal clinical preparation in education, an extended internship, and continual experiences as a student, learner, and problem solver in mathematics and chemistry.

Everyone aspiring to be a mathematics and chemistry teacher is aware of the demand for qualified teachers at the secondary level, but there is an even greater need for *quality* mathematics and chemistry teachers—teachers who care about students, mathematics and chemistry teachers who have a broad and deep understanding of mathematics and chemistry and teachers who are thoroughly professional. The responsibilities are great, but the rewards are even greater.

As a prospective teacher you need to focus on expanding your personal understanding of mathematics and chemistry and capitalizing on opportunities to work with pre-college students as a tutor, as a classroom assistant, as a practicum student, and as a novice teacher in your internship.

How to Declare:

Students planning to major in Chemistry and Mathematics are advised to consult the Department at the beginning of their first quarter on campus to arrange for proper sequence of courses.

A cumulative GPA of at least 2.50, plus a minimum grade of C (2.0) or better in individual courses, must be maintained in the courses required by the major.

Mid-Program Checkpoint:

Students intending to complete a Bachelor's of Arts in Education degree in Chemistry/Mathematics—Secondary Education should complete the following courses by the mid-way through their education. Students should follow all prerequisite requirements for courses and seek early departmental advisement.

Coursework:

Complete the general chemistry sequence.
Begin the organic chemistry sequence.
Complete the calculus sequence.
Begin the physics sequence.

Other Activities:

Make arrangements to take the WEST-B.
Consult major advisor about appropriate time to apply to Woodring College of Education, Secondary Education Department.

Contact Information:

Chemistry Department Website:
<http://www.chem.wvu.edu/dept/wwuchem.html>

Math Department Website:
<http://www.wvu.edu/depts/math/>

Chemistry Department
CB 270, 360-650-3070
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Chemistry Department Chair/
Chemistry Education Advisor:
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Math Education Advisors:
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Math Department Chair:
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Sample Careers:

Secondary Education Teacher



Chemistry/Mathematics-Secondary Major Requirements: 102-121 Credits

This major meets the requirements for Washington State teaching endorsements in both chemistry and mathematics. This major must be accompanied by the professional education program in secondary education. See the Secondary Education section of the catalog for program admission, completion, and teacher certification requirements.

CHEM 121 General Chemistry I (5)
CHEM 122 General Chemistry II (5)
CHEM 123 General Chemistry III (4)
CHEM 333 Analytical Chemistry (5)
Or CHEM 125 General Chemistry I, Honors (5)
CHEM 126 General Chemistry II, Honors (5)
CHEM 225 General Chemistry III, Honors (5)
CHEM 461 Physical Chemistry (4)
CHEM 462 Physical Chemistry (4)
MATH 124 Calculus and Analytic Geometry I (5)
Or MATH 134 Honors Calculus– I (5)
MATH 125 Calculus and Analytic Geometry II (5)
Or MATH 135 Honors Calculus II (5)
Note: MATH 138 (5) can substitute for the 124/134 and 125/135 set.
MATH 204 Elementary Linear Algebra (4)
MATH 209 Discrete Mathematics (4)
MATH 224 Multivariable Calculus and Geometry (5)
MATH 331* Ordinary Differential Equations (4)
MATH 360 Euclidean and Non-Euclidean Geometry (4)
MATH 419 Historical Perspectives of mathematics (3)
MATH 483 Methods of Teaching Secondary Mathematics (4)
Note: the pair MATH 203 and 303 can substitute for MATH 204 and 331.
PHYS 121-Physics with Calculus I w/lab (5)
PHYS 122 Physics with Calculus II w/lab (5)
PHYS 123 Electricity and Magnetism w/lab (5)
SCED 370 Science and Society (3)
SCED 481 Fundamentals of Teaching Science (2)
SCED 491 Methods in Secondary Education for Science Teachers (5)

These courses are offered within this major and may be used to satisfy GUR or Writing Proficiency requirements.

QSR: MATH 124 or higher, CSCI 145

LSCI: PHYS 121, 122, 123

CHEM 121, 122, 123

WP: Three Writing Proficiency points are required for graduation (they are noted as WP1, WP2, and WP3). Check [Classfinder](#) or [Online Timetable](#) for departmental offerings each quarter.

Option A or B

Option A CHEM 251 Elementary Organic Chemistry (5)
CHEM 375 Elements of Biochemistry (4)
Option B CHEM 351 Organic Chemistry (4)
CHEM 352 Organic Chemistry (4)
CHEM 353 Organic Chemistry (3)
CHEM 354 Organic Chemistry Laboratory I (23)
CHEM 375* Elements of Biochemistry (4)
**Or CHEM 471 Biochemistry & Molecular Bio (3)
And CHEM 472 Biochemistry & Molecular Bio (3)
And CHEM 473 Molecular Biology (3)*

Choose at least two:

MATH 207 Mathematical Computing (3)
MATH 341 Probability and Statistical Inference (4)
MATH 410 Mathematical Modeling (4)

Other Math or Chemistry Options:

Chemistry:

B.A. Chemistry (86 credits)
B.A.Ed. Chemistry/Physics–Secondary (102-115 credits plus certification program)
B.A.Ed. Chemistry/Biology–Secondary (103-104 credits plus certification program)
B.S. Chemistry (106 credits)
B.S. Biochemistry (108 credits)
Minor in Chemistry (30-32 credits)

Mathematics:

B.A. Mathematics (70 credits plus 17-20 in supporting courses)
B.A. Economics/Mathematics (94-95 credits)
B.S. Mathematics (70 credits plus 17-20 in supporting courses)
B.S. Applied Math (70 credits plus 17-20 in supporting courses)
B.S. Mathematics/Computer Science (91 credits)
B.S. Biology/Mathematics (104-105 credits)
B.A. Ed. Math–Elementary (50 credits plus certification program)
B.A. Ed. Math–Secondary (70 credits plus certification program)
B.A. Ed. Physics/Math–Secondary (106-107 credits plus certification program)
Minor in Mathematics (34-35 credits)
Minor in Mathematics–Secondary (40 credits plus certification program)