



January 9, 2013

Mathematics education minor proposed curriculum change

We wish to split our Mathematics education minor into two options*:

- Mathematics education minor: non-mathematics majors
- and
- Mathematics education minor: mathematics majors

The current Mathematics education minor has required classes that mathematics majors already take for their major coursework. However, some of our mathematics majors plan to complete their mathematics major, and then obtain their initial license to teach middle / high mathematics by completing the COE M.A.T program. Occasionally, one of these future middle or high school mathematics teachers expresses interest in the mathematics education minor; they are interested in the pedagogical training and content delivery ideas found in the mathematics education courses. We wish to create a mathematics education minor option for those students.

Current Catalog Description (WOU Catalog, 2012-2013, page 65)

Mathematics education minor

(27-28 credits)

MTH 211, 212, 213 Foundations of Elementary Mathematics (12)

MTH 396 Elementary Problem Solving (3)

MTH 392 College Algebra for Elementary and Middle School Teachers (3) –or–
MTH 111 College Algebra (4)

MTH 494 Geometry for Middle School Teachers (3)

MTH 495 Calculus for Middle School Teachers (3)

Choose one (3):

MTH 393 Probability and Statistics for Elementary and Middle School Teachers

MTH 395 Elementary Integrated Mathematics

MTH 398 Discrete Mathematics for Elementary and Middle School Teachers

MTH 492 Abstract Algebra for Middle School Teachers

Proposed Catalog Descriptions and per course explanations on next pages

* Similar to the split chemistry minor found on page 45 of the 2012-2013 WOU catalog

Per Course Explanation

Mathematics education minor: Mathematics majors (NOTE VERSION)	
MTH 211, 212, 213 Foundations of Elementary Mathematics (12)	Keep
MTH 396 Elementary Problem Solving (3)	Keep
MTH 392 College Algebra for Elem/MS Teachers (3) –or– MTH 111 College Algebra (4)	Only 392; 111 is too elementary for mathematics majors, but 392 focuses on models and pedagogy
MTH 494 Geometry for Middle School Teachers (3)	-or- 394 (Geometry for Elementary Teachers) Mathematics majors take advanced geometry and need, for this minor, a class with geometric ideas for classroom activities
MTH 495 Calculus for Middle School Teachers (3)	The content is too similar to the calculus required for the mathematics major
Choose one (3):	
MTH 393 Probability and Statistics for Elem/MS Teachers	Keep (move to required)
MTH 395 Elementary Integrated Mathematics	We no longer regularly offer this class as a similar class is offered in COE for elementary school teachers
MTH 398 Discrete Mathematics for Elem/MS Teachers	-or- 355 (Discrete Mathematics) But not both in the major/minor; similar content
MTH 492 Abstract Algebra for Middle School Teachers	The content is too similar to the group theory required for the mathematics major
Course to add as an option; this is an elective course for mathematics majors	
MTH 346 Number Theory (4)	Students study the properties of integers in this course so this would be a good option for a future middle/high teacher

Proposed Catalog Descriptions

Mathematics education minor: Mathematics majors

(27-28 credits)

MTH 211, 212, 213 Foundations of Elementary Mathematics (12)

MTH 396 Elementary Problem Solving (3)

MTH 392 College Algebra for Elementary and Middle School Teachers (3)

MTH 393 Probability and Statistics for Elementary and Middle School Teachers (3)

MTH 394 Introduction to Geometry for Elementary Teachers (3)

–or– MTH 494 Geometry for Middle School Teachers (3)

Choose one (3 - 4)

Courses used to fulfill minor requirements may not be used to fulfill major requirements

MTH 346 Number Theory (4)

MTH 355 Discrete Mathematics (4)* –or–

MTH 398 Discrete Mathematics for Elementary and Middle School Teachers (3)

* If MTH 355 is taken to satisfy any part of any mathematics major requirements, then neither MTH 355 nor MTH 398 may apply toward the mathematics education minor

Mathematics education minor: non-mathematics majors

(27-28 credits)

MTH 211, 212, 213 Foundations of Elementary Mathematics (12)

MTH 396 Elementary Problem Solving (3)

MTH 392 College Algebra for Elementary and Middle School Teachers (3)

–or– MTH 111 College Algebra (4)

MTH 494 Geometry for Middle School Teachers (3)

MTH 495 Calculus for Middle School Teachers (3)

Choose one (3):

MTH 393 Probability and Statistics for Elementary and Middle School Teachers

MTH 398 Discrete Mathematics for Elementary and Middle School Teachers

MTH 492 Abstract Algebra for Middle School Teachers

NOTE (not part of catalog description)

The only change for the non mathematics major option is the title change and Math 395 has been removed as we no longer offer this course in our regular rotation

Mathematics education minor proposed curriculum change

See marked area for sample of Chemistry minor that is split between majors and non-majors

PH 211, 212, 213 (traditional chemistry major)
PH 201, 202, 203 –or– PH 211, 212, 213
(forensic chemistry major)
MTH 251, 252

Additional information regarding these requirements should be obtained from the division. Limited courses taken at other institutions may be transferred to the program based on the course and grade obtained.

Chemistry major

(73 credits)
CH 221, 222, 223 General Chemistry (15)
CH 334, 335, 336 Organic Chemistry (9)
CH 337 Organic Chemistry Lab I (1)
CH 338 Organic Chemistry Lab II (2)
CH 312 Quantitative Analysis (4)
CH 313 Instrumental Analysis (4)
CH 350 Chemical Literature (1)
CH 440, 441, 442 Physical Chemistry (9)
CH 461, 462, 463 Experimental Chemistry (6)
CH 407 Seminar (1)
MTH 251, 252 Calculus I, II (10)
MTH 254 Multivariate Calculus (5)
Upper division Chemistry electives (6)

Preparation for a prospective chemistry major includes high school chemistry, physics and a minimum of three years of mathematics including a minimum of MTH 111 equivalency. The B.A. requires MTH 252, CS 161 and completion of the third term of the second year of a modern language course. The B.S. requires a combined total of 12 credit hours of course work in mathematics and computer science including MTH 252 and CS 161.

The B.S. and B.A. require completion of the cultural diversity and writing intensive requirements. For this major the six credits of writing intensive course work should come from CH 350W, CH 407W, CH 461W and CH 462W. The sequence PH 201, 202, 203 or PH 211, 212, 213 is to be completed as the LACC science requirement.

Chemistry majors are required to maintain a C average in their major. Forensic chemistry majors are required to maintain a C average in both major and minor.

If a chemistry major selects mathematics as a minor, the calculus sequences MTH 251, 252 and 254 are to be replaced by PH 211, 212, 213.

Chemistry minor

(30-31 credits)
CH 221, 222, 223 General Chemistry (15)
CH 334, 335, 336 Organic Chemistry (9)
CH 337 Organic Chemistry Lab I (1)
CH 338 Organic Chemistry Lab II (2)
Approved upper-division elective in chemistry (3-4)

If a biology major selects chemistry as a minor, the general chemistry sequence is to be replaced by either PH 201, 202, 203 or PH 211, 212, 213

Chemistry major: forensic chemistry option

(71-73 credits)
CH 221, 222, 223 General Chemistry (15)
CH 312 Quantitative Analysis (4)
CH 313 Instrumental Analysis (4)
CH 334, 335, 336 Organic Chemistry (9)
CH 337 Organic Chemistry Lab I (1)
CH 338 Organic Chemistry Lab II (2)
CH 340 Elementary Physical Chemistry (4)
CH 350 Chemical Literature (1)
CH 407 Seminar (1)
CH 409 Practicum (1)
CH 450, 451 Biochemistry (6)
CH 461, 462 Experimental Chemistry (4)
COM 327 Communication in the Legal Field (3)
MTH 243 Introduction to Probability & Statistics (4)
WR 322 Technical Writing (4)
Limited electives - choose one track:
BI 101, 102, 103 General Biology (10)
BI 211, 212, 213 Principles of Biology (10)

The B.A. requires MTH 252, CS 121 or 161 and completion of the third term of the second year of a modern language course. The B.S. requires a combined 12 credit hours of course work in mathematics and computer science including MTH 252 and CS 121 or 161. For this major the six hours of writing intensive course work should come from CH 350W, CH 407W, CH 461W and CH 462W. The sequence PH 201, 202, 203 or PH 211, 212, 213 is to be completed as the LACC science requirement.

Forensic science minor: chemistry majors

(27 credits)
CH 161 Fundamentals of Photography for Forensic Science (2)
CH 320 Introduction to Forensic Science (3)
CH 420 Forensic Chemistry (4)
CH 430, 431, 432 Applications of Forensic Science (6)
CJ 213 Introduction to Criminal Justice (4)
CJ 321 Principles of Forensic Investigation (4)
CJ 452 Criminal Procedure (4)

This minor may be taken by majors in other scientific disciplines providing they complete CH 221-223, CH 334-338, and CH 313.

Forensic science minor: non-chemistry majors

(29 credits)
CH 104, 105, 106 Introductory Chemistry (12)
CH 320 Introduction to Forensic Science (3)
CH 430, 431, 432 Applications of Forensic Science (6)
CJ 321 Principles of Forensic Investigation (4)
CJ 452 Criminal Procedure (4)

It is suggested that students pursuing this minor take BI 101 as part of their LACC science requirement. Alternatively CH 104, 105, 106 may be applied to the LACC. In this case, an additional 12 hours of science elective approved by the minor advisor may be substituted. CH 161 is highly recommended as a general education elective.

Chemistry major: medicinal chemistry and pharmacology option

(75 credits)
BI 334, 335 Advanced Human Anatomy and Physiology (8)
BI 336 Human Histology and Physiology (4)
CH 221, 222, 223 General Chemistry (15)
CH 312 Quantitative Analysis (4)
CH 313 Instrumental Analysis (4)
CH 334, 335, 336 Organic Chemistry (9)
CH 337 Organic Chemistry Lab I (1)
CH 338 Organic Chemistry Lab II (2)
CH 340 Elementary Physical Chemistry (4)
CH 350 Chemical Literature (1)
CH 407 Seminar (1)
CH 450, 451 Biochemistry (6)
CH 461, 462 Experimental Chemistry (4)
PH 201, 202, 203 General Physics (12) –or–
PH 211, 212, 213 General Physics with Calculus (12)

The B.A. requires MTH 251, MTH 252 and CS 121 or 161 and completion of the third term of the second year of a modern language course. The B.S. requires a combined 12 credit hours of course work in mathematics and computer science including MTH 251, MTH 252 and CS 121 or 161. For this major the six hours of writing intensive course work should come from CH 350W, CH 407W, CH 461W and CH 462W. The sequence PH 201, 202, 203 or PH 211, 212, 213 is to be completed as the LACC science requirement.

Pre-professional students should take EC 201 or EC 202 as part of their LACC requirements. Students selecting this major must complete the medicinal chemistry and pharmacology minor (Natural Science track) and maintain a C average in their major and minor coursework.

Medicinal chemistry and pharmacology minor: natural science track

(29 credits)
BI 314 Genetics (4)
BI 315 Cell Biology (4)
BI 331 General Microbiology (4)
CH 322 Medicinal Chem. & Pharmacology (4)
CH 345 Introduction to Toxicology (3)
CH 347 Biochemistry of CAM (3)
CH 452 Biochemistry Lab (3)
MTH 243 Intro to Probability and Statistics (4)

This minor may be taken by majors in scientific disciplines other than chemistry providing they complete CH 221-223. Biology majors selecting this minor option are required to meet with a medicinal chemistry and pharmacology minor advisor to select appropriate course substitutions for any minor-specific coursework that overlaps with biology major requirements.