

CHEMISTRY MAJOR FOR SECONDARY TEACHING

Updated April 2011

The major in Chemistry for Secondary teachers consists of a minimum of 30 credits. In addition to this 30 hour requirement, 16 hours of cognate coursework are required for the Chemistry major. Candidates for certification in this major must pass the Michigan Test for Teacher Certification (MTTC) in Chemistry (Test #18). You must demonstrate your knowledge in following categories:

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| 1. Construct/Reflect on Scientific Knowledge | 21-30 items |
| 2. Properties of Matter | 11-20 items |
| 3. Energy, Chemical Bonds, & Chemical Reactions | 21-30 items |
| 4. Organic, Bio-, Nuclear, & Environmental Chemistry | 11-20 items |

You may access a study guide at the MTTC testing site; the courses below have been selected so that you will be well prepared for the test.

The following chart is intended to provide you a guide for scheduling your semesters and for keeping track of your grade point average.

Please note: Though the Chemistry Department requires a minimum GPA of 2.0 for the science major chemistry courses, students seeking the Chemistry endorsement for teacher certification must have a major and/or minor GPA of 2.75.

CHEMISTRY FOUNDATIONS - REQUIRED (17-18 credits)

SUBJECT/ COURSE	TITLE	CREDIT HOURS	SEMESTER	GRADE
CHEM 111	General Chemistry I	3		
CHEM 113	Lab of General & Analytic Chemistry I	1		
CHEM 121	General Chemistry II	3		
CHEM 114	Lab of General & Analytic Chemistry II	1		
CHEM 221	Organic Chemistry I	3		
CHEM 255	Organic Chemistry Laboratory I	2		
CHEM 231	Organic Chemistry II	3		
* CHEM 256	Organic Chemistry Laboratory II	1-2		
* If selected for one credit, student MUST take a one-hour lab from the upper level or elective offerings listed below.				

UPPER LEVEL CHEMISTRY COURSES (6-7 credits) At least two (2) of the following elective courses must be included:

SUBJECT/ COURSE	TITLE	CREDIT HOURS	SEMESTER	GRADE
CHEM 311	Biochemistry I	3		
CHEM 322	Inorganic Chemistry	3		
CHEM 331 & CHEM 332	Analytical Chemistry Lecture & Analytical Chemistry Laboratory	3 1		
CHEM 343	Physical Chemistry I	3		
<i>(Chemistry 331 and 332 must be taken together and are considered one course. This lab credit may be part of the 6 required lab hours, but may only be counted once as part of the 30 hour total.)</i>				

REMAINING ELECTIVE COURSES (5-7credits)

Electives may include CHEM 311, 322, 331 & 332, or 343 if not selected for the required upper level Chemistry coursework listed on the previous page.

SUBJECT/ COURSE	TITLE	CREDIT HOURS	SEMESTER	GRADE
CHEM 314	Biochemistry II	3		
CHEM 315	Biochemistry II Lab	1		
CHEM 324	Inorganic Laboratory	1		
CHEM 344	Physical Chemistry II	3		
CHEM 345	Physical Chemistry Lab I	1		
CHEM 346	Physical Chemistry Lab II	1		
CHEM 347	Chemical Modeling Laboratory	1		
CHEM 348	Advanced Spectroscopy Laboratory	1		
CHEM 421	Structure, Dynamics and Synthesis I	3		
CHEM 422	Structure, Dynamics and Synthesis II	3		
CHEM 490	Research in Chemistry	1-3		
CHEM 499	Internship in Chemistry	1-2		

Required cognate courses:

MATH COURSES (8 credits, cognate)

SUBJECT/ COURSE	TITLE	CREDIT HOURS	SEMESTER	GRADE
MATH 126 OR MATH 131 MATH 132	Calculus with Review II Calculus I Calculus II	4 4 4		

PHYSICS COURSES (8 credits, cognate)

SUBJECT/ COURSE	TITLE	CREDIT HOURS	SEMESTER	GRADE
PHYS 121	General Physics I	3		
PHYS 141	Physics Lab I	1		
PHYS 122	General Physics II	3		
PHYS 142	Physics Lab II	1		

*** College Physics 105, 106, 107, 108 may be appropriate for the BA degree in some programs of study. Any substitution of these Physics courses must be approved by the Chemistry chairperson.*

A SCIENCE METHODS COURSE - REQUIRED (3 credits)

(The Science methods course is considered pedagogy and will be counted with your education courses for certification.)

SUBJECT/ COURSE	TITLE	CREDIT HOURS	SEMESTER	GRADE
EDUC 331	Teaching of Science in the Secondary School (offered Fall Semester only)	2		
EDUC 332	Teaching of Science in the Secondary School Field Placement (offered Fall Semester only)	1		

This MUST be completed prior to the student teaching semester!