

# CHEMISTRY MINOR FOR SECONDARY TEACHING

Updated May 2015

The **Chemistry minor** (State Code: DC) for Secondary teachers consists of a minimum of 21 credits in Chemistry.

Teacher candidates for certification in Chemistry at the Secondary level must pass the Michigan Test for Teacher Certification (MTTC) in Chemistry (Test #018). MTTC content exams should not be taken until 90% of course work in the subject area has been completed. A study guide is available at the MTTC website: ([http://www.mttc.nesinc.com/PDFs/MI\\_field018\\_SG.pdf](http://www.mttc.nesinc.com/PDFs/MI_field018_SG.pdf)).

The courses below meet State standards and have been selected so that teacher candidates will be well prepared for the test. Knowledge must be demonstrated in the following categories in order to successfully pass the MTTC subject area exam:

| Subarea  | Approximate % of Questions |
|--|----------------------------|
| 1. Reflecting On and Constructing Scientific Knowledge | 25%                        |
| 2. Using Inorganic Chemistry                           | 32%                        |
| 3. Using Physical Chemistry                            | 27%                        |
| 4. Using Organic Chemistry and Biochemistry            | 16%                        |

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

**PLEASE REFER TO YOUR DEGREE EVALUATION IN KNOWHOPE PLUS IN ADDITION TO THIS DOCUMENT TO DETERMINE FULFILLMENT OF COURSE REQUIREMENTS**

**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 (13 credits)

| SUBJECT/ COURSE | TITLE   | CREDIT HOURS | SEMESTER | GRADE |
|-----------------|---|--------------|----------|-------|
| CHEM 125*       | General Chemistry I   | 3            |          |       |
| CHEM 127*       | Lab of General & Analytic Chemistry I<br><b>Laboratory</b>  | 1            |          |       |
| CHEM 126*       | General Chemistry II  | 3            |          |       |
| CHEM 128*       | Lab of General & Analytic Chemistry II<br><b>Laboratory</b> | 1            |          |       |
| CHEM 221        | Organic Chemistry I   | 3            |          |       |
| CHEM 255        | Organic Chemistry Laboratory I                              | 2            |          |       |

\* It is possible to substitute the entire general chemistry sequence (Chem 125/126/127/128) with accelerated general chemistry (Chem 131-132)

## REMAINING ELECTIVE COURSES (8 credits) Choose 8 credits from courses listed below:

| SUBJECT/ COURSE | TITLE                           | CREDIT HOURS | SEMESTER | GRADE |
|-----------------|---------------------------------|--------------|----------|-------|
| CHEM 311        | Biochemistry I                  | 3            |          |       |
| CHEM 322        | Inorganic Chemistry             | 3            |          |       |
| CHEM 331        | Analytical Chemistry Lecture &  | 3            |          |       |
| CHEM 332        | Analytical Chemistry Laboratory | 1            |          |       |
| CHEM 343        | Physical Chemistry I            | 3            |          |       |
| CHEM 231        | Organic Chemistry II            | 3            |          |       |
| CHEM 256        | Organic Chemistry Laboratory II | 1-2          |          |       |
| CHEM 314        | Biochemistry II                 | 3            |          |       |
| CHEM 315        | Biochemistry II Lab             | 1            |          |       |

|                 |  |          |  |  |
|-----------------|--|----------|--|--|
| CHEM 324        | Inorganic Laboratory                       | 1        |  |  |
| <b>CHEM 335</b> | <b>Neurochemistry and Disease</b>          | <b>4</b> |  |  |
| 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        |  |  |
| <b>GES 430</b>  | <b>Advanced Environmental Geochemistry</b> | <b>4</b> |  |  |
| CHEM 490        | Research in Chemistry                      | 1-3      |  |  |
| CHEM 499        | Internship in Chemistry                    | 1-2      |  |  |

**A SCIENCE METHODS COURSE - REQUIRED** (4 credits)

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

| SUBJECT/<br>COURSE | TITLE   | CREDIT<br>HOURS | SEMESTER | GRADE |
|--------------------|---|-----------------|----------|-------|
| EDUC 331*          | Teaching of Science in the Secondary School<br>(offered Fall Semester only)                 | 3               |          |       |
| EDUC 332           | Teaching of Science in the Secondary School<br>Field Placement (offered Fall Semester only) | 1               |          |       |

**This MUST be completed prior to the student teaching semester!**

**\*Effective for students entering Fall 2015, EDUC 331 changed from a 2 credit course to a 3 credit course**