

INTEGRATED SCIENCE GROUP MAJOR IN COMBINATION WITH GEOLOGY MINOR FOR SECONDARY TEACHING

March 2017

The **Integrated Science major** (State Code: DI) for Secondary Certification consists of **40 credits** distributed over three areas of emphasis: Life Science, Earth and Space Science, and Physical Science. The courses must include significant laboratory experiences.

Teacher candidates for certification in Integrated Science at the Secondary level must pass the Michigan Test for Teacher Certification (MTTC) in Secondary Integrated Science (Test #094). 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_field094_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. | Constructing and Reflecting on Scientific Knowledge | 25% |
| 2. | Life Science | 25% |
| 3. | Earth and Space Sciences | 25% |
| 4. | Physical Sciences | 25% |

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

LIFE SCIENCE COURSES (12 Credits) – Required

| SUBJECT/ COURSE | TITLE | CREDITS | SEMESTER | GRADE |
|---------------------------|---|------------|----------|-------|
| BIOL 105 & BIOL 107 | Introduction to Biology I & Introduction to Biology I Lab | 3 1 | | |
| BIOL 106 & BIOL 108 | General Biology II & General Biology II Lab | 3 1 | | |
| BIOL 221 | Human Physiology | 4 | | |

EARTH AND SPACE SCIENCE COURSES (12 Credits) – Required

| SUBJECT/ COURSE | TITLE | CREDITS | SEMESTER | GRADE |
|-----------------------|---|---------|----------|-------|
| GEMS 152 | The Atmosphere and Environmental Change | 4 | | |
| GEMS 157 (GES 100) | The Planet Earth | 4 | | |
| GES 203 | Historical Geology | 4 | | |

PHYSICAL SCIENCE COURSES (16 Credits) - Required

| SUBJECT/ COURSE | TITLE | CREDITS | SEMESTER | GRADE |
|---------------------------|---|---------|----------|-------|
| PHYS 121 & PHYS 141 | General Physics I & Physics Lab I | 3 1 | | |
| PHYS 122 & PHYS 142 | General Physics II & Physics Lab II | 3 1 | | |
| CHEM 125 & CHEM 127 | General Chemistry I & Lab of General & Analytic Chemistry I | 3 1 | | |
| CHEM 126 & CHEM 128 | General Chemistry II & Lab of General & Analytic Chemistry II | 3 1 | | |

OTHER COURSES (4 Credits)

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

| SUBJECT/ COURSE | TITLE | CREDITS | SEMESTER | GRADE |
|--------------------|---|---------|----------|-------|
| EDUC 331* | Teaching of Science in the Secondary School (offered Fall Semester Only) | 3 | | |
| 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!

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

**GEOLOGY MINOR WORKSHEET AND "SAMPLE" 4 YEAR PLAN
ON THE FOLLOWING PAGES BELOW**



**GEOLOGY FOR SECONDARY TEACHING
CERTIFICATION IN EARTH SCIENCE MINOR
IN COMBINATION WITH INTEGRATED SCIENCE GROUP MAJOR**

The **Geology minor** (State Code: DH) for Secondary teachers consists of a minimum of 24 credits.

Teacher candidates for certification in Geology at the Secondary level must pass the Michigan Test for Teacher Certification (MTTC) in Earth/Space Science (Test #020). 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_field020_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. Foundations of Scientific Inquiry | 20% |
| 2. Physical and Historical Geology | 20% |
| 3. Oceanography and Freshwater Systems | 20% |
| 4. Meteorology | 20% |
| 5. Astronomy | 20% |

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

REQUIRED GEOLOGY COURSES (8 of 12 credits may be double counted with DI major)

| SUBJECT/ COURSE | TITLE | CREDIT HOURS | SEMESTER | GRADE |
|-----------------------|---|-----------------|----------|-------|
| GEMS 152 | The Atmosphere and Environmental Change | 4 | | |
| GEMS 157 (GES 100) | Planet Earth | 4 | | |
| GES 203 | Historical Geology | 4 | | |

ADVANCED COURSES (must select 16 credits)

| SUBJECT/ COURSE | TITLE | CREDIT HOURS | SEMESTER | GRADE |
|--------------------|----------------------------|-----------------|----------|-------|
| GEMS 201 | Evolution of Dinosaurs | 2 | | |
| GEMS 206 | The Night Sky | 2 | | |
| GES 243 | Mineralogy | 4 | | |
| GES 244 | Petrology | 4 | | |
| GES 251 | Surficial Geology | 4 | | |
| GES 252 | Structural Geology | 4 | | |
| GES 341 | Regional Field Geology | 2 | | |
| GES 351 | Invertebrate Paleontology | 4 | | |
| GES 430 | Environmental Geochemistry | 4 | | |
| GES 450 | Hydrogeology | 4 | | |
| EDS 453 | Sedimentology | 4 | | |

SAMPLE
Integrated Science Major (DI) with a Geology Minor
FOR SECONDARY CERTIFICATION
 4 year plan

Note:

1. In order to student teach a minimum G.P.A. of 2.75 is required in your major, minor, education classes, and overall.
2. Students earning a Secondary Major must complete field placements in middle and high school, and in both major and minor areas of study.
3. Students earning a Secondary Major must complete field placements in racially/ethnically and socio-economically diverse classrooms.

March 2017

| | Fall | | | Spring | | | Summer | | |
|-----------------|--------------|----|------------|--------------|----|---------------|---------------------|----|------------|
| | CLASS | CR | ATTRIBUTES | CLASS | CR | ATTRIBUTES | CLASS | CR | ABBRIBUTES |
| FRESHMAN | IDS 100 | 2 | GE – FYS | PHYS 121/141 | 4 | DI & GE (NSL) | Social Science 2 | 2 | GE |
| | ENGL 113 | 4 | GE – EW | IDS 171 | 4 | GE – CH1, GLI | | | |
| | IDS 200 | 4 | GE – GLD | GES 100 | 4 | DI & GE (NSL) | | | |
| | KIN 140 | 2 | GE – HD | For. Lang. 2 | 4 | GE – FL2 | | | |
| | IDS 172 | 4 | GE – CH2 | | | | | | |
| | Total | 16 | | Total | 16 | | | | |
| SOPHMORE | CHEM 125/127 | 4 | DI | CHEM 126/128 | 4 | DI | REL 200 | 4 | GE – REL2 |
| | BIOL 105 | 3 | DI | EDUC 225/226 | 4 | ED | | | |
| | BIOL 107 | 1 | DI | GES 203 | 4 | DI | | | |
| | GEMS 152 | 4 | DI | EDUC 270 | 2 | ED | | | |
| | EDUC 220/221 | 4 | ED | Fine Arts 2 | 2 | GE | | | |
| | Total | 16 | | Total | 16 | | | | |
| JUNIOR | GES elective | 4 | m | EDUC 285/286 | 4 | ED | Fine Arts 1 | 4 | GE – FA1 |
| | EDUC 275/276 | 3 | ED | BIOL 106 | 3 | DI | | | |
| | GES elective | 4 | m | BIOL 108 | 1 | DI | | | |
| | REL 100 | 2 | GE | GES elective | 4 | m | | | |
| | PHYS 122/142 | 4 | DI | MATH | 2 | GE | | | |
| | | | | EDUC 287 | 2 | ED | | | |
| Total | 17 | | Total | 16 | | | | | |
| SENIOR | EDUC 360/361 | 3 | ED | EDUC 455 | 1 | ED | | | |
| | GES elective | 4 | m | EDUC 480 | 10 | ED | | | |
| | BIOL 221 | 4 | DI | EDUC 500 | 1 | ED & GE – SSI | | | |
| | EDUC 331/332 | 4 | DI/ED | IDS 452 | 4 | GE - SRS | | | |
| | | | | | | | | | |
| | Total | 15 | | Total | 16 | | | | |

Note: G.L.I. (global learning international) possibilities – check Degree Works, FYS, ENGL 113, IDS 171, Rel2 and select History and Literature courses

*Increasingly we see students bringing in AP credits for English, Math, and some of the social sciences (Psychology or Sociology being most common). If a student does bring in some of these credits, it could eliminate the need for summer courses.

Key:

- GE – General Education
- DI – Integrated Science Major
- ED – Education
- GLD – Global Learning Domestic
- GLI – Global Learning International
- m – minor

1. Please see an education faculty member for personal advising. This sample is simply *one* way to plan your schedule, and your selection of a minor might allow for additional double counting.
2. Please consult the Hope College Catalogue for semesters when courses are offered, as these may vary.