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

October 2019

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 130	Introduction to Environmental Science	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		
*MATH 126 or MATH131 is a corequisite or prerequisite for PHYS 121/141 and MATH 132 is a prerequisite or corequisite for PHYS122/142				

OTHER COURSES (4 Credits)

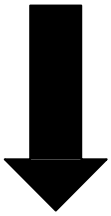
(The required Science methods course is considered pedagogy and will be counted with your education courses for certification.)

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!

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 22 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 (Only 8 of 14 credits may be double counted with DI major)

SUBJECT/ COURSE	TITLE	CREDIT HOURS	SEMESTER	GRADE
GEMS 130	Introduction to Environmental Science	4		
GEMS 157 (GES 100)	Planet Earth	4		
GEMS 206	The Night Sky	2		
GES 203	Historical Geology	4		

ADVANCED COURSES (must select 14 credits)

SUBJECT/ COURSE	TITLE	CREDIT HOURS	SEMESTER	GRADE
GEMS 201	Evolution of Dinosaurs	2		
GES 225	Intro to Geographic Information Systems	2		
GES 243	Mineralogy	4		
GES 244	Petrology	4		
GES 251	Surficial Geology	4		
GES 252	Structural Geology	4		
GES 320	Introduction to Petroleum Geology	4		
GES 341	Regional Field Geology	2		
GES 351	Invertebrate Paleontology	4		
GES 430	Environmental Geochemistry	4		
GES 450	Hydrogeology	4		
GES 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.

November 2021

	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		
	ENGL 113	4	GE – EW	IDS 171	4	GE – CH1, GLI	Science 2	2	GE
	KIN 140	2	GE – HD	GES 100	4	DI & GE (NSL)			
	IDS 172	4	GE – CH2	For. Lang. 2	4	GE – FL2			
	REL 200	4	GE – REL2						
	Total	16		Total	16				
SOPHMORE	CHEM 125/127	4	DI	CHEM 126/128	4	DI			
	BIOL 105	3	DI	EDUC 225/226	4	ED			
	BIOL 107	1	DI	GES 203	4	DI			
	GEMS 130	4	DI	EDUC 270	4	ED			
	EDUC 200/201	4	ED & GLD	Fine Arts 2	2	GE			
	Total	16		Total	18				
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	2	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			
	GEMS 206	2	m						
				Total	16				
	Total	15							

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.

**MATH 126 or MATH131 is a corequisite or prerequisite for PHYS 121/141 and MATH 132 is a prerequisite or corequisite for PHYS122/142.

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.