PHYSICS MAJOR FOR SECONDARY TEACHING

Updated February 2020

The **Physics major** (State Code: DE) for Secondary teachers consists of a minimum of 30 credits in Physics. Cognate courses are also required beyond the 30 hours.

Teacher candidates for certification in Physics at the Secondary level must pass the Michigan Test for Teacher Certification (MTTC) in Physics (Test #019). 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_field019_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	12%
2.	Mechanics	24%
3.	Electricity and Magnetism	24%
4.	Waves, Acoustics, and Optics	20%
5.	Nature of Matter, Thermodynamics, and Modern Physics	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

PHYSICS REQUIRED CORE (16 credits)

SUBJECT/ COURSE	TITLE	CR. HRS.	SEM. TAKEN	SUBSTITUTION
PHYS 121*	General Physics I	3		
PHYS 141*	Physics Lab I	1		
PHYS 122*	General Physics II	3		
PHYS 142*	Physics Lab II	1		
PHYS 270	Modern Physics (every fall)	4		
PHYS 280	Intro. to Mathematical Physics (every spring)	2		
PHYS 281	Intermediate Physics Lab (every spring)	2		
*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 PHYSICS COURSES (14 credits)*

SUBJECT/ COURSE	TITLE	CR. HRS.	SEM. TAKEN	SUBSTITUTION
GEMS 151 OR GEMS 206	Science and Technology for Everyday Life / The Night Sky	4 / 2		
At least two 300/400 Level Courses				
PHYS 342	Electricity and Magnetism (spring even yrs)	4		
PHYS 352	Optics (occasionally)	3		
PHYS 361	Analytical Mechanics[1] (every fall)	4		
PHYS 362	Thermodynam. & Stat. Mechanics (fall even yrs)	4		
PHYS 372	Quantum Theory (spring odd yrs)	4		
PHYS 382	Advanced Physics Lab (every fall)	2		
With **PRIOR** permission of the department remaining credits may be filled by other Physics courses. PHYS_____ _____ PHYS_____ _____				

*PHYS 361 was moved from a required course to an elective course, therefore, if this course is not taken, a substitution form will need to be completed.

[1]Programming competency is a prerequisite for this course

REQUIRED COGNATE COURSES

MATH (16 credits)

SUBJECT/ COURSE	TITLE	CR. HRS.	SEM. TAKEN	SUBSTITUTION
MATH 131	Calculus I	4		
MATH 132	Calculus II	4		
MATH 231	Multivariable Math I	4		
MATH 232	Multivariable Math II	4		

SCIENCE LAB COURSE (4 credits)

SUBJECT/ COURSE	TITLE	CR. HRS.	SEM. TAKEN	SUBSTITUTION
May choose a Biology, Chemistry, or Geology lab course. With **PRIOR** permission of the department a GEMS course may be substituted for a departmental course.				
Course: _____	_____			

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/ COURSE	TITLE	CR. HRS.	SEM. TAKEN	SUBSTITUTION
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!

"SAMPLE" 4 YEAR PLAN

ON THE FOLLOWING PAGES BELOW

SAMPLE
Physics Major and 20 Credit 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.
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	EDUC 200/201	4	ED & GLD	For Lang	4	GE-FL2
	PHYS 121/141	4	M & GE-NSL	PHYS 122/142	4	M & GE-NSL			
	KIN 140	2	GE-HD	MATH 132	4	M & GE-MA2			
	MATH 131	4	M & GE-MA2	REL 100	2	GE-REL1			
	ENG 113	4	GE-EW	EDUC 270	4	ED			
	Total	16		Total	18				
SOPHMORE	EDUC 225/226	4	ED	PHYS 280	2	M	IDS 171	4	GE-CH1
	PHYS 270	4	M	PHYS 281	2	M	Fine Arts 1	4	GE-FA1
	MATH 231	4	M	MATH 232	4	M			
	Minor	4	m	GEMS 206	2	M			
				Minor	8	m			
	Total	16		Total	18				
JUNIOR	EDUC 275/276	3	ED	EDUC 285/286	4	ED	REL 200	4	GE – REL2
	PHYS elective	4	M	EDUC 287	2	ED	Fine arts 2	2	GE-FA2
	Social Sci 2	2	GE-SS2	Phys elective	4	M			
	Minor	4	m	IDS 172	4	GE-CH2			
	Minor Methods	4	m	Non Physics NSL	4	M			
	Total	17		Total	18				
SENIOR	EDUC 360/361	3	ED	EDUC 455	1	ED			
	EDUC 331/332	4	ED	EDUC 480	10	ED			
	Phys elective	6	M	EDUC 500	1	ED & GE-SS1			
	Minor	4	m	IDS 452	4	GE-SRS			
	Total	17		Total	16				

Note: G.L.I. (global learning international) possibilities – check degree evaluation, 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
ED – Education
GLD – Global Learning Domestic
GLI – Global Learning International
m – minor
M – Major

1. Please see an education faculty member for personal advising. This sample is simply *one* way to plan your schedule.
2. Please consult the Hope College Catalogue for semesters when courses are offered, as these may vary.