Physics (7-12)
Teacher Licensure Requirements

**Program Requirements**

**Gen Ed:** Satisfactory completion of all general education requirements (generally 55 semester hours).

**Major:** Satisfactory completion of a major in physics (plus the addition of PHYS 107) for a total of approximately 41 semester hours with the addition of 22 semester hours of course work in related fields as described below.

**Education:** Satisfactory completion of a minor in education (34 semester hours) as described below. Before being admitted to the Teacher Education Program, the student must first demonstrate Math competency by earning a grade of C- or higher in a 4 semester hour course that fulfills the general education quantitative reasoning requirement (courses designated with a “Q”).

**Electives:** Additional electives, as needed, to meet graduation requirement of 130 semester hours.

**Note:** All courses in the teaching field must be passed with grades of C- or higher. See the Academic Catalog for additional requirements for admission and continuance in the program. Courses may not be offered every year. Be sure to check with the department for schedule of course offerings.

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### Required in Physics (approximately 41 total hours)

- Phys 107 – Astronomy (4)
- Phys 200 - Mechanics and Waves (5)
- Phys 213 – Thermodynamics and Optics (2)
- Phys 214 – Intermediate Physics Laboratory (1)
- Phys 215 – Special Relativity and Applications (2)
- Phys 218 – Introductory Electromagnetism (5)
- Phys 220 – Modern Physics (5)
- Phys 311 - Classical Mechanics (4)
- Phys 312 - Wave Phenomena (5)
- Phys 313 – Electronics (2)
- Phys 360 - Junior Seminar (1)
- Phys 460 - Senior Seminar (1)
- Plus, 4 additional semester hours taken at the 300 level or above:
  - Phys 314 – Digital Electronics (2)
  - Phys 320 - Computational Physics (2)
  - Phys 321 - Signal Processing (2)
  - Phys 325 - Topics in Contemporary Physics (2)
  - Phys 330 - Statistical and Thermal Physics (4)
  - Phys 332 - Electromagnetism (4)
  - Phys 380 - Topics (1-4)
  - Phys 410 - Mathematical Physics (4)
  - Phys 411 - Quantum Mechanics (4)
  - Phys 490 - Independent Study (variable credit)
  - Phys 491 - Internship (variable credit)
  - Phys 499 - Senior Honors Thesis (variable credit)

### Required in Related Departments (22 sem hrs)

**Required in mathematics:**

- Math 201 - Calculus I (4)
- Math 202 - Calculus II (4)
- One additional math course. Either
  - Math 212 - Multivariable Calculus (4) OR
  - Math 215 - Differential Equations (4)

**Required in chemistry:**

- Chem 121 – Models of Chemical Systems (5)

**Required in biology:**

- Biol 170 – Concepts of Biology: Biological Information, Reproduction, and Evolution (5) OR
- Biol 180 – Concepts of Biology: Energy and Resources in Biology (5)
Required in Education (34 sem hours)

Note: All education courses must be passed with grades of C- or higher. See College Catalog for additional requirements for admission to and continuance in the program.

Entry-Level Courses

___ Educ 103 S Sociological Perspectives in Education (4)
or, Educ 104 R Philosophical Perspectives in Education (4)
___ Educ 112 Human Development & Learning Theory: Middle Childhood through Young Adult (2)
___ Educ 120 Introduction to Students with Special Needs (2)
   (Educ 112 and 120 are to be taken concurrently)

Advanced Courses

Admission to the Teacher Education Program is required. Apply no later than midterm prior to enrollment in the first course.

___ Educ 304 Responsive Schools the Middle Grades (2) (offered Fall & Spring semester)
___ Educ 306 Curriculum and Instruction for High School (4)
___ Educ 312 Reading and Writing in Content Areas (4)

Student Teaching

Application for permission to student teach must be submitted early spring term of the junior year. Other coursework, if taken, must be scheduled for late afternoon or evenings during the term.

___ Educ 342 Including Students with Special Needs in Mid/Sec Classes (2)
___ Educ 348 Teaching Science in Secondary Schools (2)
___ Educ 495 Student Teaching (12)

Additional Education Requirements:

___ Successful completion of State Board of Education Examinations
   (Complete during the senior year)

Note: Changes in this program of study must be approved by the chairperson of the major department and the Director of Teacher Licensure, Wittenberg University.