

## **Undergraduate Physics Teacher Preparation Program Degree and Certification Requirements**

The undergraduate physics teacher preparation program is based on completion of a BS in Physics degree with supplemental required classes. The degree requires a strong foundation in physics and mathematics, comprising at least 63 physics, math, and related credits. Among these related credits, teacher candidates take courses in biology, chemistry, and earth science, which are beyond the requirements for the physics major. The current physics major requires 37 credits with the PHY designator. All students are encouraged to undertake research. Laboratory work comprises a significant portion of the degree credits and an exhibition of written expression is required. (Students who will receive the BS under old rules must receive at least 36 credits of PHY courses for the education minor, as required by the state.) Students must pass all PHY courses with a minimum grade of C. New York State will not accept a C- or lower for teacher certification.

All applicants to the Physics Teacher Preparation Program must:

- Apply to the program during the second semester of sophomore year or first semester of junior year.
- Have taken at least 4 science lab courses.
- Contact the physics education advisor for a transcript review and to plan a course of study.
- Achieve a cumulative GPA of 2.75 and a GPA of 2.75 in science courses.
- Contact one of the science education program advisors for an interview.
- Fill out the Professional Education Program Undergraduate Application Form (see <http://www.sunysb.edu/pep/docs/UnderAppForm.doc>). Attach an unofficial copy of your transcript(s) from all colleges and universities that you have attended, three letters of reference from university faculty regarding your potential to become a teacher, and your essay. Submit all documents for approval by the Science Education Program Director.
- Declare a Teacher Preparation option by submitting the “Declaration of Major/Minor Form” with TP to the Registrar. Forms are available at the Registrar’s Office, the Undergraduate Physics advisor’s office in the Physics Building, and the Science Education Program Office, Life Sciences 001.

**Physics Content for Teacher Preparation** (almost the same as for BS in Physics)

**A. Required Laboratory Courses:**

PHY 131/133, 132/134 Classical Physics I, II and Laboratory (see note)

PHY 251/252 Modern Physics Lecture and Laboratory

PHY 277 Computation for Physics and Astronomy

PHY 300 Waves and Optics

PHY 335 Electronics and Instrumentation Laboratory

PHY 445 Senior Laboratory I

Note: The three semester PHY 125/126/ 127 sequence or the Honors 141/142 sequence may be substituted for PHY 131/133, 132/134.

**B. Required Lecture Courses:**

PHY 301 Electromagnetic Theory

PHY 303 Mechanics

PHY 306 Thermodynamics, Kinetics Theory, and Statistical Mechanics

PHY 308 Quantum Physics

All PHY courses required for the major must be completed with a grade of C or higher.

At least four of these courses numbered 300 and above must be taken at Stony Brook.

The above physics requirements total 37 credits.

**C. Courses in Mathematics:**

Equivalency for MAT courses achieved on the Mathematics Placement Examination is accepted as fulfillment of the corresponding requirements without the necessity of substituting other credits.

1. One of the following sequences:

MAT 131, 132 Calculus I, II or MAT 141, 142 Honors Calculus I, II or MAT 125, 126, 127 Calculus A, B, C

2. One of the following:

MAT 205 Calculus III, or MAT 203 Calculus III with Applications or AMS 261 Applied Calculus III

3. One of the following:

MAT 305 Calculus IV or MAT 303 Calculus IV with Applications or AMS 361 Applied Calculus IV Differential Equations

The above mathematics requirements total 14 credits.

**D. Courses in Related Fields:**

Twelve credits of acceptable physics-related courses that complement the physics major are required. A list of acceptable courses, which include courses for teacher preparation, is posted in the Physics and Astronomy Undergraduate Office.

**Notes:**

1. Students taking the PHY125, 126, 127 sequence may have to delay portions of their program, because of the prerequisite structure in physics courses. (It may be possible to recover by taking a class in summer school.)
2. Students *must* include among their electives one semester of biology (BIO 201 *or* BIO 202), and Chemistry [CHE 131/133 (students are encouraged to take CHE 132 and CHE 134)], and one of the following Earth Science course combinations: GEO 102/112, *or* GEO 122 *or* AST 101/112 *or* ATM 102 *or* ATM 105.
3. To qualify for the General Science (7-12) certification, candidates must complete a minimum of 18 semester hours in two or more sciences other than physics. Additional elective courses may be needed to meet this requirement.

**E. Interdisciplinary Seminar Series:**

The Nature of Science and the Human Endeavor (4 sessions, 0 credit, required).  
See advisor for each semester's schedule.

**F. Required Courses on Professional Studies in Education:**

PSY 327 Human Development in an Educational Context  
SSE 350 Foundations in Education  
LIN 344 Language Acquisition and Literacy Development  
CEF 347 Introduction to Special Education  
SCI 410 Pedagogy and Methods in Science Education I  
SCI 449 Field Experience I (co-requisite SCI 410)  
SCI 420 Pedagogy and Methods in Science Education II  
SCI 450 Field Experience II (co-requisite SCI 420)  
SCI 451 Supervised Student Teaching 7 – 9\*\*  
SCI 452 Supervised Student Teaching 10 – 12\*\*  
SCI 454 Student Teaching Seminar \*\*

\*\* Note: Prior to admission to student teaching, candidates will be interviewed by a committee to assess their ability to speak extemporaneously about both physics concepts and pedagogical issues. Candidates who are not successful in this interview will be counseled in order to remedy deficiencies. Upon completion of the remediation another interview will be held. In the event that a candidate is unable to satisfy the interview component, the candidate will not advance to student teaching.

75 days of student teaching are required. Dependent on the semester and public school vacation schedules, student teaching may extend beyond the university semester calendar. Student teaching is divided into two placements of approximately equal duration, one in a middle school/junior high school and the other in a high school.

### **G. Field Experience:**

Field Experience sites for all teacher candidates are arranged through SCI 449 and SCI 450. Assignments and details are distributed in SCI 410 and SCI 420. New York State requires 100 hours of field experience in secondary schools prior to student teaching. Each teacher candidate is required to obtain 15 hours of field experience that includes a focus on understanding the needs of students with disabilities. These hours will be noted on the Field Experience Time Sheets from SCI 449, SCI 450, or a combination of both. In earning these field experience hours, teacher candidates will be encouraged to observe inclusion (integrated co-teaching) classes in their certification area and other special education classroom situations as available

### **H. State Tests, Mandated Seminars and Fingerprinting:**

- All teacher candidates must be fingerprinted during SCI 410.
- Prior to student teaching, candidates must complete three mandated seminars, *Training in Child Abuse Recognition, Substance Abuse Education, and School Violence and Intervention*. For details see <http://www.sunysb.edu/spd/career/tworkshops.html>.

New York State is in the process of modifying the examinations required for teacher certification, effective May 2014. Details are not yet available but will be discussed in Methods classes as soon as the new examinations are finalized.

For those graduating prior to May 2014, the following test regimen is in place:

- Prior to Student Teaching placement, candidates must earn a passing grade (220 or higher) on the Liberal Arts and Sciences Test (LAST) component of the New York State Teacher Certification Exams (NYSTCE).
- In order to qualify for certification, candidates must pass the Content Specialty Test (CST) in physics with a minimum score of 220. It is a program requirement that candidates with a score lower than 220 on any sub-section of the CST must pass an alternate exam on the concepts of that section which will be administered by departmental faculty
- The Assessment of Teaching Skills, Written (ATS-W) is required prior to certification.
- For further information about the NYSTCE testing program, visit their website at <http://www.nystce.nesinc.com/>.

### **I. Language Requirement:**

New York State certification requires at least one year (6 credits) of college level study of a foreign language. Satisfaction of SBU's DEC Entry Skill 3 fulfills this requirement.

### **J. Professional Portfolio:**

The Professional Portfolio is presented and defended at the conclusion of student teaching. It includes many performance indicators of standards-based teaching competencies.