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 65 physics, math, and related credits. Among these related credits, teacher candidates take courses in biology, chemistry, and either earth science or astronomy, 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 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 3.0 and a GPA of 3.0 in science courses.
- Contact one of the science education program advisors for an interview.
- Fill out the Teacher Preparation Undergraduate Application Form (see https://www.stonybrook.edu/commcms/dtale/admissions/undergraduate.php). Attach an unofficial copy of your transcript(s) from all colleges and universities that you have attended, three letters of reference (at least two 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 061.

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

Note: The three-semester PHY 125/126/127 sequence or the honors sequence PHY 141/142 may be substituted for PHY 131/132.

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 at least 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 or AMS 151,161 Applied Calculus I, II

2. One of the following:

   MAT 203 Calculus III with Applications or MAT 307 Multivariable Calculus with Linear Algebra or AMS 261 Applied Calculus III

3. One of the following:

   MAT 303 Calculus IV with Applications or MAT 308 Differential Equations with Linear Algebra or AMS 361 Applied Calculus IV Differential Equations

4. One of the following:

   MAT 211 Introduction to Linear Algebra or AMS 110 Applied Linear Algebra or both MAT 307 and MAT 308

The above mathematics requirements total at least 14 credits.

Sample course sequence for a PHY major with a teacher preparation option

Fall, Freshman Year	cr		Spring, Freshman Year	cr
MAT 131: Calc. 1 SBC: QPS	4		MAT 132: Calc. 2	4
PHY 131/133: Physics 1/Lab SBC: SNW	4		PHY 132/134: Physics 2/Lab	4
SPN 111: Elementary Spanish I*	3		SPN 112: Elementary Spanish II* SBC: LANG	3
WRT 102: Writing SBC: WRT	3		HIS 104: US since 1877 SBC: SBS, USA	3
Freshman Seminar (101)	1		Freshman Seminar (102)	1
Total	15		Total	15
Fall, Sophomore Year			**Spring, Sophomore Year**	
MAT 307: Calc. 3/Lin Alg.	4		MAT 308: Calc. 4/Lin Alg.	4
PHY 251/252: Modern Physics/Lab SBC: STEM+	4		PHY 300: Waves & Optics	4
PHY 277 Programming SBC: TECH	3		PHY 335 Electronics Lab	3
BIO 201/204 Organisms to Ecosystems/Lab	5		CHE 131/133 Chemistry 1/Lab	5
Total	16		Total	16
Fall, Junior Year			**Spring, Junior Year**	
PHY 301: Elec/Mag with MAT 341 optional	3		PHY 306: thermo and statistical mechanics	3
PHY 303: Mechanics	3		PHY 308: Quantum Physics	3
CCS 101: Cinema SBC: ARTS, HUM	3		SCI 410: Methods I	3
HUR 235: Crime Punish SBC: CER, GLO, HUM	3		SCI 449: Field Experience I	1
GEO 102/112 The Earth/Lab	4		LIN 344: Literacy Development	3
HIS 396: Topics in US History SBC: SBS+	3		SSE 350: Foundations of Education	3
			AST 248: Search for Life SBC: STAS	3
Total	19		Total	19
Fall, Senior Year			**Spring, Senior Year**	
PHY445: Senior Lab SBC: ESI, SPK	3		SCI 451 Student Teaching 7-9	6
PSY 327: Human Development	3		SCI 452 Student Teaching 10-12	6
SCI 420: Methods II SBC: CER, EXP+, SPK	3		SCI 454 Student Teaching Seminar	3
SCI 450 Field Experience II	1			
CEF 347 Special Education	3			
PHY 475: Teaching Practicum SBC: EXP+	3			
PHY 459 Write Effectively SBC: WRTD	0			
Total	16		Total	15

***Satisfaction of SBU's SBC LANG fulfills the foreign language requirement.**

D. Courses in Related Fields:

Twelve credits of acceptable physics-related courses that complement the physics major are required. All courses required for the teaching minor are included among these related courses.

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 BIO 201 *and* BIO 204, CHE 131/133 (students are encouraged to take CHE 132 and CHE 134), and either GEO 102/112 or AST101/112.

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. Required Courses on Professional Studies in Education (35 credits)**:**

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.

F. 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

G. State Tests, Mandated Seminars and Fingerprinting:

- All teacher candidates must be fingerprinted during SCI 410.
- Prior to student teaching, candidates must complete five mandated seminars, *Training in Child Abuse Recognition, Substance Abuse Education, School Violence and Intervention,* and *Dignity for All Students* (DASA). For details and to register for the seminars on campus, see http://www.sunysb.edu/spd/career/tworkshops.html.

New York State examinations required for teacher certification are:

- Educating All Students Test (EAS)

- Content Specialty Test (CST) in physics [Note: 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.]
- Teacher Performance Assessment (edTPA) - This is a portfolio assessment that is prepared during the student teaching semester.
- For further information about the NYSTCE testing program, visit their website at http://www.nystce.nesinc.com/.

It is recommended that candidates take the EAS upon completion of CEF 347 and LIN 344, and take the CST upon completion of physics courses required for the major. The edTPA will be completed during student teaching.

H. 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 SBC LANG fulfills this requirement.

I. 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.