



Stony Brook University

# Becoming a Biology Teacher

## Three Routes to New York State Certification

Stony Brook University offers three programs registered and approved by the New York State Education Department for individuals seeking New York State certification to teach biology in secondary schools, grades 7 - 12:

The **undergraduate** route to certification requires completion of a Bachelor of Science in Biology with the Teacher Preparation option. (See page 2)

The **graduate** route to certification requires completion of the Master of Arts in Teaching Biology degree, as well as completion of an undergraduate degree in biology (or the equivalent of a Stony Brook University undergraduate biology degree). (See page 5)

The **combined** route to certification in which students obtain both the Bachelor of Science in Biology and Master of Arts in Teaching Biology degrees in 5 years, i.e., one additional year beyond the bachelor degree alone. (See page 8)

The Stony Brook program is aligned with the standards of the National Science Teachers Association (NSTA), National Council for Accreditation of Teacher Education (NCATE), the National Educators Association (NEA) Code of Ethics, Interstate New Teacher Assessment and Support Consortium (INTASC), and the National Board for Professional Teacher Standards (NBPTS).

**Undergraduates:** For advisement, contact Biology Advisor Ellen Lopez, in the Biology Undergraduate Program Office in the Biology Learning Laboratories Building, (631) 632-8530. Email inquiries to [elopez@notes.cc.sunysb.edu](mailto:elopez@notes.cc.sunysb.edu).

**Graduates:** For advisement, contact MAT Biology Advisor, Dr. Zuzana Zachar at (631) 632-8970 or [zzachar@ms.cc.sunysb.edu](mailto:zzachar@ms.cc.sunysb.edu).

**Science Education Program:** The Director of Science Education is Dr. Keith Sheppard, [Keith.Sheppard@stonybrook.edu](mailto:Keith.Sheppard@stonybrook.edu), (631) 632-2989, and the Assistant Director of Science Education is Linda Padwa, [Linda.Padwa@stonybrook.edu](mailto:Linda.Padwa@stonybrook.edu), (631) 632-7075.

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

The undergraduate biology teacher preparation program is based on completion of a major program in biology and a minor in secondary education. The undergraduate program requires over 65 science credits and includes a strong foundation in biology, chemistry, physics, and mathematics. Laboratory work comprises a significant portion of these credits, and an exhibition of written expression is required.

**NOTE:** Biology majors preparing for New York State Teacher Certification must take a total of **36 credits** of biology, which is beyond the requirement for the biology major that is completed by students preparing for graduate study or for employment as biologists.

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All applicants to the Biology Teacher Preparation Program must:

- Apply to the program during second semester of sophomore year.
- Have taken at least 4 science lab courses.
- Achieve a 2.75 cumulative GPA and a 2.75 GPA in science courses.
- Contact the biology major advisor for a transcript review and to plan a course of study.
- Contact one of the science education program advisors for an interview (see front page for details).
- 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 each college or university that you have attended 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 Biology advisor’s office in the Biology Learning Laboratories Building, and the Science Education Program Office, Life Sciences 001.

## Biology Content for Teacher Preparation Option

### A. Biology Core Courses:

1. \_\_\_\_\_ BIO 150 – The Living World (see note 1)
2. \_\_\_\_\_ BIO 201, 202, 203 – Fundamentals of Biology (see note 2)
3. \_\_\_\_\_ BIO 204, 205 – Fundamental of Scientific Inquiry in the Biological Sciences

### B. Courses Required in Related Fields:

1. \_\_\_\_\_ **Calculus:** MAT 123 & 125 & 126 or MAT 131, 132 or MAT 141, 142 or MAT 171, or AMS 151 & 161 or level 8 or 9 on the Mathematics Placement Examination.
2. \_\_\_\_\_ **General Chemistry:** CHE 123, 124, & 132, or CHE 129, 130 & 132, or CHE 131 & 132, or CHE 141 & 142
3. \_\_\_\_\_ **General Chemistry Laboratory:** CHE 133 & 134, or CHE 143 & 144
4. \_\_\_\_\_ **Organic Chemistry:** CHE 321, and either CHE 322 or 326, or CHE 331 and 332
5. \_\_\_\_\_ **Organic Chemistry Laboratory:** CHE 327 or CHE 383
6. \_\_\_\_\_ **Physics with Lab:** PHY 121/123 & PHY 122/124 or PHY 125 & 126 & 127 or PHY 131/133 & 132/134 or PHY 141 & 142
7. \_\_\_\_\_ **Statistics & Probability:** AMS 110 or AMS 310
8. \_\_\_\_\_ **Earth and Space Sciences:** One course in a geoscience area. See advisor.

### C. Advanced Courses:

#### Advanced Lecture Courses:

Students must complete at least one advanced course in each of the following areas of biology.

**Area I - \_\_\_\_\_ Cell Biology and Biochemistry:** BIO 310, 314, 315, 316, 317#, 361, 362

**Area II - \_\_\_\_\_ Genetics and Development:** BIO 320, 325, 339#

**Area III - \_\_\_\_\_ Neurobiology and Physiology:** BIO 317#, 328, 334, 338, 339#

**Area IV - \_\_\_\_\_ Organisms:** BIO 340, 341, 343, 344, 348, 380; MAR 370, 371

**Area V - \_\_\_\_\_ Ecology and Evolution:** BIO 301, 336, 350, 351, 353, 354, 358, 359, 371, 385, 386; MAR 301, 302, 366; ANP 325.02, 350.02, 391.02

**Note:** (#) BIO 317 and BIO 339 may not be used to satisfy more than one Advanced Lecture Area.

### D. Study in Depth:

Students should select **one** of the following **two** options:

\_\_\_\_\_ Two Advanced Courses (see above) in Area (BIO 318 can be used as 2<sup>nd</sup> course in ANY Lecture Area above)

\_\_\_\_\_ Any 400-level course for biology majors (or ANP 487.03) (or SCI 454 for students in the BTPP or SCI 554 for students completing the BIO BS/MAT **and** taking one course in each of the five areas above)

**Advanced Laboratory Courses:** Two advanced laboratory courses chosen from any of the six areas below. (NOTE: Only one course may be chosen from each area below. Four (4) credits and at least two (2) consecutive semesters of independent biology research (BIO 486, BIO 487, BIO 489) may replace one upper division laboratory course. Internship courses cannot be used to satisfy the advanced laboratory requirement.)

**Area I** - \_\_\_\_\_ BIO 311, 313, 365

**Area II** - \_\_\_\_\_ BIO 327

**Area III** - \_\_\_\_\_ BIO 335

**Area IV** - \_\_\_\_\_ BIO 340, 341, 343, 344, 380; MAR 380

**Area V** - \_\_\_\_\_ BIO 319, 352, 356, 367, 371; MAR 301, 303, 305, 320, 388

**Area VI** - \_\_\_\_\_ BIO 312

**Upper Division Writing Requirement:** Students must also fulfill the Upper Division Writing Requirements for the degree in Biology. See the Biology advisor for details.

### **Undergraduate Teaching Practicum in College Biology**

All biology majors seeking secondary biology teaching certification are recommended to take BIO 475/476.

### **Biology Electives**

Advanced biology lecture, laboratory, readings and independent research courses, should be taken as needed, to achieve a minimum of 36 credits. (See notes 3 and 4.)

### **Notes:**

1. Students with a high school Biology course and a math placement score of 3 or better can receive a waiver for BIO 150. A waiver of BIO 150 does not count towards the minimum number of credits in Requirements A and C above. Although not a required course, BIO 150 is recommended for majors with a math placement score of less than 3 and/or without prior biology training. The three credits of BIO will count towards the Biology major, but not the minor.
2. The Undergraduate Biology Studies Committee must approve requests for waivers of major requirements. Biology majors must meet the major requirements of the bulletin of their latest matriculation date.
3. All biology courses intended for the biology major (and the additional BIO credits needed for New York State Teacher Certification) must be passed with a grade C or higher.
4. A grade of S for readings and research courses applies to the Biology Major requirements within the following credit limitations: four credits of biology independent research (BIO 484, 486, 487, 489) and two credits of tutorial readings (BIO 444, 446, 447, 449) may be applied toward the major.

### **E. Interdisciplinary Seminar Series:**

\_\_\_\_\_ The Nature of Science and the Human Endeavor (required - 4 sessions, 0 credit)

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

- \_\_\_ PSY 327 Middle Childhood/Adolescent Development
- \_\_\_ 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 (*See Note 5*)
- \_\_\_ SCI 452 Supervised Student Teaching 10 – 12 (*See Note 5*)
- \_\_\_ SCI 454 Student Teaching Seminar (*See Note 5*)

#### Note 5:

- Prior to admission to student teaching, candidates will be interviewed by a committee to assess the ability to speak extemporaneously about both biology 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.
- Seventy-five 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 biology 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 six 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.

## **Master of Arts in Teaching Biology**

**Admission requirements:** BS degree in biology (including two semesters chemistry, two semesters organic chemistry, two semesters physics, one semester geoscience, at least one semester of calculus, and one semester of statistics); GPA of 2.75 overall, and GPA of 3.0 in sciences.

**Application:** The faculty advisor for the MAT in Biology program is Dr. Zuzana Zachar, email: [zzachar@notes.cc.sunysb.edu](mailto:zzachar@notes.cc.sunysb.edu); 631-632-8970. For application materials log on to [http://www.stonybrook.edu/spd/graduate/matapp\\_nogre.html](http://www.stonybrook.edu/spd/graduate/matapp_nogre.html).

### **Courses:**

The program consists of 44 credits as follows: 15 credits content courses, 20 credits pedagogy and methods courses, 9 credits student teaching.

### **A. Required Core Science Courses:**

#### **Three courses from the following list:**

- \_\_\_\_\_ BIO 511 Topics in Biotechnology
- \_\_\_\_\_ BIO 520 Topics in Molecular Genetics
- \_\_\_\_\_ BIO 558 Biology & Human Behavior
- \_\_\_\_\_ CEB 554 Current Topics in Immunology
- \_\_\_\_\_ BIO 515 Current Topics in Microbiology

#### **Two courses from the following list:**

- \_\_\_\_\_ CEB 505 History of the Long Island Environment
- \_\_\_\_\_ CEB 557 Forensic Science
- \_\_\_\_\_ BIO 521 Laboratory Science Curriculum Development
- \_\_\_\_\_ CHE 593 Chemical Demonstrations

In addition, you may choose a content course from one of the Masters or PhD programs in Marine Science, Genetics, Molecular & Cellular Biology and Ecology & Evolution. The MAT Biology director's approval is required prior to registration for courses within these programs.

**B. Required Professional Studies in Education Courses:**

- \_\_\_ CEE 505 Education: Theory and Practice
- \_\_\_ PSY 595 Human Development
- \_\_\_ LIN 544 Language Acquisition and Literacy Development
- \_\_\_ CEF 547 Principles and Practices of Special Education
- \_\_\_ SCI 510 Pedagogy and Methods in Science Education I
- \_\_\_ SCI 549 Field Experience I (co-requisite SCI 510)
- \_\_\_ SCI 520 Pedagogy and Methods in Science Education II
- \_\_\_ SCI 550 Field Experience II (co-requisite SCI 520)
- \_\_\_ SCI 551 Supervised Student Teaching 10 – 12 (*See Section H below*)
- \_\_\_ SCI 552 Supervised Student Teaching 7 – 9 (*See Section H below*)
- \_\_\_ SCI 554 Student Teaching Seminar (*See Section H below*)

**C. Interdisciplinary Seminar Series:**

- \_\_\_ The Nature of Science and the Human Endeavor (required - 4 sessions, 0 credit)

**D. Field Experience:**

Field Experience sites for all teacher candidates are arranged through SCI 549 and SCI 550. Assignments and details are distributed in SCI 510 and SCI 520. 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 549, SCI 550, 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.

**E. State Tests, Mandated Seminars and Fingerprinting:**

- All teacher candidates must be fingerprinted during SCI 510.
- 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>.

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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

biology 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/>.

#### **F. Language Requirement:**

New York State certification requires 6 credits of a foreign language or its equivalent.

(Satisfaction of SBU's DEC Entry Skill 3 fulfills this requirement.) Bilingual students may satisfy this requirement by taking the CLEP exam in foreign language.

([http://www.collegeboard.com/student/testing/clep/ex\\_foreign.html](http://www.collegeboard.com/student/testing/clep/ex_foreign.html))

#### **G. 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 and a Master's Essay.

#### **H. Student Teaching:**

Prior to admission to student teaching, candidates will be interviewed by a committee to assess the ability to speak extemporaneously about both biology 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.

Seventy-five 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 the same duration, one in a middle school/junior high school and the other in a high school.

#### **I. Middle Level Extension**

Candidates who wish to qualify to teach grades 5 and 6 in a middle school setting may obtain an extension to their grades 7-12 certification by completing two additional courses. The courses are: CEE 601 Early Adolescent Development and CEE 602 Middle Child Education-Instruction.

Information about these courses can be found on the SPD website ([www.stonybrook.edu/spd](http://www.stonybrook.edu/spd)).



## Five Year BS/MAT Biology Teacher Preparation Program Degree and Certification Requirements

The BS/MAT program in Biology Education is based upon the completion of a combined BS in Biology and Master of Arts in Teaching in Biology. It is possible to complete both degrees in 5 years (instead of 5 ½ years) because of credit sharing between the programs. This program requires a combination of the courses that are required for each of the individual degree programs.

Applicants to the BS/MAT Biology Teacher Preparation Program must:

- Have taken at least 4 science lab courses
- Contact the Biology Education advisor, Ellen Lopez, in the Biology Undergraduate Program Office, Biology Learning Laboratories Building, (631) 632–8530) for a transcript review and to plan a course of study
- Achieve a cumulative GPA of 3.00 and a GPA of 3.00 in science courses
- Apply for the combined program during junior year
- Complete the BS/MAT application  
([http://www.stonybrook.edu/spd/graduate/ba\\_mat.html](http://www.stonybrook.edu/spd/graduate/ba_mat.html))
  - SPD Student Application/Information Sheet
  - Three (3) letters of recommendation
  - Official transcript from each college or university attended
  - Application Essay
  - Any additional items required by SPD
- Submit application prior to SPD deadline as posted on the SPD website ([www.stonybrook.edu/spd](http://www.stonybrook.edu/spd))

Upon entry to the program, candidates must declare a Teacher Preparation option along with their Undergraduate major by submitting the “Declaration of Major/Minor Form” with TP to the Registrar. Forms are available at the Registrar’s Office, the Undergraduate Biology advisor’s office in the Biology Learning Laboratories Building, and the Science Education Program Office, Life Sciences 001.

### **Number of semesters of full-time study required for program completion at the undergraduate and graduate levels.**

Students should apply to the combined BS/MAT program during their fifth or sixth semester of study. The first six semesters of the program are full time study at the undergraduate level. Semesters seven and eight will include a mix of undergraduate and graduate courses. Semesters nine and ten will consist of graduate courses only. Candidates will generally advance to Graduate status during their eighth semester.

**Note:** The two degrees are conferred only when the entire combined degree program has been completed. Both degrees are conferred together unless the student elects to exit the combined degree program and receive only a BS in Biology. Students must maintain a B average in their graduate courses. Students who are unable to maintain this average in their graduate studies will be encouraged, while in Semester 8 of their studies, to leave the program and graduate with a BS degree in Biology.

## Biology BS/MAT Sample Course Sequence

	UG	G		UG	G
<b>semester 1 (Fall)</b>				<b>semester 6 (Spring)</b>	
CHE 129/130 or CHE 131	4		PHY 122/124	4	
CHE 133	1		BIO Area III or IV	3	
MAT 125	3		Bio lab	3	
SBU 101	1		DEC	3	
DEC	3		GEO 102/112	4	
DEC	3				
<b>semester 2 (Spring)</b>				<b>semester 7 (Fall)</b>	
	4		Bio Area V (and DEC H) BIO 351	3	
CHE 132			Bio lab	3	
CHE 134	1		GRAD 1/ BIO 515 (adv. Lab)		3
MAT 126	3		LIN 344	3	
BIO 201, 202 or 203	3		CEE 505		3
DEC	3				
SBU 102	1				
<b>semester 3 (Fall)</b>				<b>semester 8 (Spring)</b>	
CHE 321	3		DEC	3	
BIO 201 or 202	3		PSY 595		3
			GRAD 2 / Area V BIO 558 Human Biology		3
BIO 204	2		SCI 510		3
CHE 327 or AMS 110	2 or 3		SCI 549		1
DEC	3		DEC	3	
DEC	3				
<b>semester 4 (Spring)</b>				<b>semester 9 (Fall)</b>	
CHE 322	3		SCI 520		3
CHE 327 or AMS 110	2 or 3		SCI 550		1
BIO 201, 202 or 203	3		CEF 547		3
	3		Grad 3 / Area I CEB 554 Immunology		3
BIO Area III or IV			Grad 4/ area II BIO 520 Genetics		3
BIO 205	2		Grad 5 Biology Elective		3
DEC	3				
<b>semester 5 (Fall)</b>				<b>semester 10 (Spring)</b>	
PHY 121/123	4		SCI 551		3
BIO Area Elective	3		SCI 552		3
BIO Area III or IV	3		SCI 554		3
DEC	3				
DEC	3				

The above listing of courses provides a suggested sequence for coursework. There is a degree of flexibility in the order of courses, but any deviation from the above without permission of the program advisor may lead to a delay in completion of the program.

A student wishing to complete the 5 year combined program is strongly encouraged to consult with the Biology advisor for individualized guidance in course selection.

## Additional Requirements

### **Interdisciplinary Seminar Series:**

The Nature of Science and the Human Endeavor (4 sessions, 0 credit, required).

### **Student Teaching:**

Seventy-five days of student teaching are required. Depending 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.

Prior to admission to student teaching, candidates will be interviewed by a committee to assess their ability to speak extemporaneously about both biology 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.

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

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- 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/>.

**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 the foreign language requirement.

**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.

**Middle Level Extension**

Candidates who wish to qualify to teach grades 5 and 6 in a middle school setting may obtain an extension to their grades 7-12 certification by completing two additional courses prior to graduation. The courses are: CEE 601 Early Adolescent Development and CEE 602 Middle Child Education-Instruction. More information about these courses can be found on the SPD website ([www.stonybrook.edu/spd](http://www.stonybrook.edu/spd)).