REVIEW OF BACHELOR OF SCIENCE IN BIOLOGY TEACHER EDUCATION

Classification of Instruction Programs (CIP) Code: 13.1322
Biology Teacher Education

OVERVIEW

The B.S. in Biological Sciences Teacher Education (BTE) program at Illinois State University is housed in the School of Biological Sciences within the College of Arts and Sciences. The School offers three undergraduate majors—Biological Sciences, Molecular and Cellular Biology, and Biology Teacher Education—as well as a minor in Biological Sciences. The BTE program prepares students to become licensed secondary education teachers in biology, combining a strong foundation in biological sciences with pedagogical training aligned to national and state teaching standards. Students in the program take content courses alongside general biology majors and complete professional education coursework through the College of Education. The curriculum integrates standards such as the Illinois Professional Educator Standards (IPES), InTASC Model Core Teaching Standards, and the Culturally Responsive Teaching and Leading Standards, along with the National Science Teaching Association (NSTA)/Association for Science Teacher Education (ASTE) Science Standards. Students engage in extensive clinical experiences in diverse school settings, including options for year-long internships and traditional student teaching placements across Illinois. The program, newly designated as a stand-alone major, continues to respond to national challenges in science teacher preparation while maintaining its status as an exemplary program under the Illinois Educator Preparation Profile.

Enrollment and Degrees Conferred by Plan of Study, Fall Census Day, 2017-2024
B.S. in Biological Sciences Teacher Education, Illinois State University
First Majors Only

	2017	2018	2019	2020	2021	2022	2023	2024
Enrollments	57	67	81	73	71	58	55	47
Degrees	1	9	12	18	11	21	7	13

Table notes:
Graduating Fiscal Year consists of summer, fall, and spring terms, in that order. For example, Graduating Fiscal Year 2024 consists of the following terms: summer 2023, fall 2023, and spring 2024.

EXECUTIVE SUMMARY
PROGRAM REVIEW SELF-STUDY REPORT

Self-study process
To begin the self-study process, the Secondary Education Program Coordinator along with Director of the School of Biological Sciences and Assistant Director of the School of Biological Sciences met to review unit information from the last program review within the Unit (Molecular-Cellular Biology) to identify what updates needed to be made and what data will be used for program review as this is the first program review of the Biology Teacher Education program since is transition from a sequence to a major.

The self-study process included organizing teacher education data collected yearly for the Annual Program Improvement Review (APIR) completed by all teacher education programs at ISU. Data from mandated state and national reporting for the Illinois State Board of Education (ISBE) licensure and the Council for the Accreditation of Educator Preparation (CAEP) accreditation in secondary education which requires communication and feedback from stakeholders, employers, alumni, and others in secondary and k-12 Education programs was analyzed and summarized. Previous program assessment and feedback was also reviewed. Major findings along with future initiatives and plans were identified and communicated.

Program curriculum

Graduation requirements: 120 credit hours including 95 credit hours for the degree program and 25 credit hours for General Education. The 95 credit hours for the degree program include 38 credit hours of biology courses, 18 credit hours of other science courses, 25 credit hours of education-related courses, and 12 credit hours of student teaching.

Program or academic unit faculty

Program faculty-

- 1 Administrative Professional/non-tenure track faculty member
- 1 adjunct, non-tenure track faculty member

Unit faculty-

- 21 Tenure track faculty
- 5 Non-tenure track faculty

Program goals and quality indices

Academic Program Goals - Program Learning Objectives created for BS degrees within the School of Biological Sciences:

- Goal 1 - Insight into disciplines that extend from central concepts
- Goal 2 - Functional understanding or scientific method and research
- Goal 3 - Fostering development of related skills

First, they (students) develop an understanding of the fundamental concepts that unite fields of biology. These concepts are central themes that are essential for anyone pursuing a career in biology-related fields. Next, students are shown that biology is a set of related disciplines. Students gain insight into the unique aspects of subdisciplines as well as an integrated view of these disciplines as part of the unified field. Additionally, students are encouraged to gain an understanding of scientific research as a process. This is accomplished by covering the scientific method and research approaches, as well as encouraging students to participate in research projects under faculty supervision. Finally, students involved in the program develop related skills such as statistical evaluation and scientific literacy.

In addition to the program learning objectives, the Biology Teacher Education program also aligns with the following state and national standards/goals.

The InTASC Model Core Teaching Standards:

> A set of Model Core Teaching Standards that outline what teachers should know and be able to do to ensure every PK-12 student reaches the goal of being ready to enter college or the workforce in today's world. This "common core" outlines the principles and foundations of teaching practice that cut across all subject areas and grade levels and that all teachers share. They were created by the Council of Chief State School Officers (CCSSO), through its Interstate Teacher Assessment and Support Consortium (InTASC).

Illinois Professional Teaching Standards (IPTS) transitioning into the (updated) Illinois Professional Educator Standards (IPES):

> Establishes the minimum requirements for both the approval of any teacher preparation program or course of study in any teaching field pursuant to the State Board's rules for licensure (23 Ill. Adm. Code 25.Subpart C) and the basis of the examinations required for issuance of a professional educator license endorsed in a teaching field. – Illinois State Board of Education (ISBE)

Illinois' new Culturally Responsive Teaching and Leading ("CRTL") Standards:

> These standards are aimed at helping future teachers engage and connect with students from all backgrounds. The new CRTL Standards apply a culturally responsive approach to Illinois' rules for teacher training programs, requiring programs to incorporate concepts such as implicit bias, historical inequities, student advocacy and representation, and social-emotional development into their educator training coursework. The new CRTL standards require all existing teacher preparation programs to incorporate the new standards. – Illinois State Board of Education

The NSTA/ASTE 2020 Science Standards for Teacher Preparation:

> These standards are intended to be used by science teacher preparation programs in preparing for accreditation or program design. These standards can also serve as a guide for state agencies developing licensure standards for science teacher preparation. – National Science Teaching Association/Association of Science Teacher Education

The Next Generation Science Standards (NGSS):

> The NGSS are K–12 science content standards developed by states to improve science education for all students. A goal for developing the NGSS was to create a set of research-based, up-to-date K–12 science standards. These standards give local educators the flexibility to design classroom learning experiences that stimulate students' interests in science and prepares them for college, careers, and citizenship.

Student learning outcomes assessment plan and process

Data is collected through the Teacher Education Quality Assurance System Annual Program Improvement Review (APIR) formerly the AAR. This assessment plan is aligned to the standards listed above. (edDispositions, Lesson Plan Rubric, edTPA, CPAST, Content tests)

Specialized accreditation

BTE is an accredited Education Preparation Provider (EPP) by the Council for the Accreditation of Educator Preparation (CAEP) through Spring 2026. BTE is an ISBE institution of higher education (IHE) approved preparation program. The BTE program leads to an Illinois Professional Educator's Licensure in Science – Biology.

Responses to recommendations resulting from the previous program review

This is the first program review of Biology Teacher Education. The overall comments from the last academic assessment plan will be used instead. Included in this self-study are multiple sets of standards used as student learning outcomes. Course syllabi are used in the alignment of those outcomes through alignment to the standards. There are multiple documents, processes, and assessments used by the College of Education to track student outcomes in secondary programs. In the future, more specific review of information with other secondary science programs will be included along with documentation of how the information guides the improvements identified.

Changes in the academic discipline, field, societal need, and program demand

Changes within the academic discipline are reflected in revisions of existing teacher education standards and in new sets of standards such as the Culturally Responsive Teaching and Leading standards (CRTLS). Faculty in the Biology Teacher Education program, both in biology and the College of Education have designed instruction to effectively address culturally responsive teaching and instruction for diverse learners within the context of teaching a secondary subject area.

Illinois is currently experiencing a teacher shortage. Demand for teachers has increased while the number of Biology teacher candidates enrolled in most Illinois universities has significantly decreased in recent years.

Major findings of this program review self-study

Students in the Biology Techer Education program are provided a quality, comprehensive education including a multitude of science content courses taught by mostly tenure-track faculty, a sequence of standards-driven teacher education-specific courses within BSC taught by knowledgeable instructors with previous high school and middle school classroom experience. Required education-specific secondary education courses in the College of Education are taught by qualified tenure and nontenure track faculty. The program includes multiple pre-student teaching clinical experiences both within biology and in courses offered through the College of Education. Students have options for student teaching including year-long internships and traditional, one semester placements with our school partners and when possible, ISU alumni, and are supervised by former classroom teachers. As a result of this, BTE students are graduating on-time, passing the ISBE-required science content test, successfully completing student teaching, and obtaining an Illinois professional educators license and immediate employment.
ISU needs to be able to attract and retain more Biology Teacher Education students both first time college students and transfer students. Improvements could be made in ways to communicate the option of Biology Teacher Education to general Biology students considering future employment options along with creating increased interest among specific graduate students early on in their graduate program to pursue the licensure-only option within the Biology Teacher Education program to provide additional employment opportunities post-graduation. In the future,

improvements could include the Biology Teacher Education program taking a larger role in the preparation of the other science teacher education students including the middle level sciences.

Initiatives and plans for the next program review cycle
The Biology Teacher Education program will work to do the following in the next review cycle:

- Continued and organized methods of data analysis with the other science education programs and with our school partners. BTE will consider of use of professional associations such as the Illinois Science Teaching Association as a means to better network with educators in the field and to recruit stakeholders for data analysis.
- Continued and organized methods of tracking alumni. BTE will work with the School of Biological Sciences to create a plan to better-track BTE alumni.
- Continued and organized methods of student recruitment to the BTE program. BTE will work with the School of Biological Sciences to create a means to specifically recruit to the major. BTE will continue to support the COE recruitment initiatives including participating in the future teacher conference and other activities and provide information on the program for advertisement, etc. BTE, in conjunction with the School of Biological Sciences will work with the new College of Arts and Sciences director of student success, retention, and recruitment.
- Continued monitoring of the curriculum in the required courses in the program to ensure alignment to program, state, and national standards, and the Illinois science content test framework.

PROGRAM REVIEW OUTCOME AND RECOMMENDATIONS FROM THE ACADEMIC PLANNING COMMITTEE

The Academic Planning Committee (APC) has completed its review of the B.S. in Biology Teacher Education. The committee recognizes that this program, recently established as a standalone major, grew out of a sequence within the School of Biological Sciences. We acknowledge the faculty's work in adapting to state-level teacher education standards (Illinois State Board of Education, CAEP) and commend the program's ongoing assessment practices through the College of Education's quality assurance systems. The committee notes the strong biological content foundation, the variety of clinical experiences offered, and improved time-to-degree measures as significant strengths.

While recognizing the B.S. in Biology Teacher Education program has many strengths, the committee is concerned about many aspects regarding the current state of the program and several of these issues that were highlighted in the self-study. Our concern stems primarily from the program's organizational structure, faculty engagement, declining enrollments, and the need for strategic efforts in recruitment, stakeholder engagement, and benchmarking against peer and aspirational programs. Strengthening the connection between the School of Biological Sciences and the teacher education curriculum will ensure that the program remains responsive to the evolving demands of 9-12 education. Therefore, the Academic Planning Committee flags the B.S. in Biology Teacher Education program for further review. The committee requests that the School of Biological Sciences take the following actions and submit the following reports based on those actions.

Report Due by October 1, 2026
Submit to the Academic Planning Committee via the Office of the Provost.

Improve benchmarking and external analysis:
The committee requests a more comprehensive analysis of comparator and aspirational biology teacher education programs, including national examples, to identify best practices and models of success. Consider interdisciplinary approaches, innovative scheduling, and pathways that enhance student preparation and reduce time-to-degree. Use these findings to inform strategic planning and curriculum updates.

Develop a targeted enrollment management Strategy:
The program should also develop a strategic recruitment, and enrollment management tailored to the B.S. in Biology Teacher Education. This plan should include efforts to diversify the student population. Engage with prospective students through outreach events, partnerships with school districts, community colleges, and university admissions resources. Highlight career opportunities in biology education to attract a robust and diverse candidate pool. This

report should describe how insights from comparative analyses inform specific, actionable steps to strengthen enrollment and refine the program's structure.

Progress in clarifying faculty roles and increasing engagement and involvement in leadership:
The committee asks the program to outline steps taken to clarify the involvement of tenure-track Biological Sciences faculty in the B.S. in Biology Teacher Education curriculum. This includes developing a sustainable model for faculty leadership within the program, ensuring students benefit from mentoring, research-informed teaching, and long-term curricular oversight. This may also involve assigning specific faculty to oversee aspects of the program, ensuring cohesive curriculum planning, and offering mentorship opportunities for teacher candidates.

Strengthen stakeholder and alumni engagement:
Implement formal feedback mechanisms to regularly gather input from alumni, school partners, and employers. Establish advisory groups or surveys to guide curriculum refinement, track graduate outcomes, and demonstrate the program's impact on 9-12 education.