

ACCELERATED BACHELOR OF SCIENCE IN BIOLOGY/ PROFESSIONAL SCIENCE MASTER'S IN BIOTECHNOLOGY (P.S.M.)

The purpose of this program is to provide exceptional undergraduate students in Biology a path toward accelerated completion of a Professional Science Master's (P.S.M.) degree in Biotechnology. Students in the program will complete 12 graduate hours during their final 30 hours of undergraduate coursework that will count toward both their B.S. in Biology and P.S.M. in Biotechnology degrees.

This is a competitive program, and students must submit an application and meet eligibility requirements during the junior year to be admitted to the program. Upon graduating with the B.S. in Biology, a student in the accelerated program must submit a formal application for admission to the P.S.M. in Biotechnology program and meet all admissions requirements.

The Professional Science Master's in Biotechnology is an interdisciplinary degree that combines the study of biology and business with an internship in the biotech sector to prepare students for a professional career in industry. Biotechnology and life sciences is one of the top 5 growth sectors in the state, creating a demand for biotechnology professionals in Texas. Providing students an accelerated path to the P.S.M. degree with a growing industry of career opportunities will encourage increased enrollment and make us more competitive to top students across Texas. Please see the Graduate Catalog for a complete list of degree requirements for the P.S.M. in Biotechnology program (<http://catalog.twu.edu/graduate/arts-sciences/biology/professional-science-master-biotechnology/>).

Marketable Skills

Defined by the Texas Higher Education Coordinating Board's 60x30 Strategic Plan (<https://reportcenter.highered.texas.gov/agency-publication/miscellaneous/theceb-60x30-strategic-plan/>) as, "Those skills valued by employers that can be applied in a variety of work settings, including interpersonal, cognitive, and applied skills areas. These skills can be either primary or complementary to a major and are acquired by students through education, including curricular, co-curricular, and extracurricular activities."

- Effectively articulate ideas on biological concepts via written communications and oral presentations.
- Demonstrate critical thinking by using logic and reasoning to interpret scientific results.
- Ability to design and conduct properly controlled experiments using modern scientific instruments and methods.
- Effectively propose potential technical solutions to modern biological problems or human health challenges.
- Integrate scientific knowledge and professional business concepts, principles, and ethics in the biotechnology sector.

- Work collaboratively as part of a team to perform, analyze, and present scientific results and/or research outcomes.
- Ability to understand research regulations and comply with all laboratory safety guidelines.

Admissions

It is recommended that students interested in this path speak with their undergraduate advisor as early as their freshman year of study. Once admitted to the accelerated program students must meet with their undergraduate advisor each semester prior to registering for courses. During the final semester of undergraduate coursework, students should seek advising from the P.S.M. graduate advisor to discuss a graduate degree plan.

Program Coordinator

Stephanie A. Pierce, PhD
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Application Deadlines

- Fall - June 1st
- Spring - October 1st
- No summer admissions

Admissions Requirements

To apply to the Accelerated B.S. in Biology/P.S.M. in Biotechnology program, students must:

- Be currently enrolled in the B.S. in Biology program (<http://catalog.twu.edu/undergraduate/arts-sciences/biology/>) at TWU.
- Have a minimum cumulative grade point average of 3.5 at the time of application.
- Have successfully completed a minimum of 72 semester credit hours of coursework toward the B.S. in Biology.
- Have a minimum of 12 semester credit hours (SCH) of electives remaining toward the B.S. Biology degree. Three SCH must be an upper-level general elective. The remaining nine credit hours can be upper-level general or biology electives.

How to Apply to the Accelerated Program

Students interested in applying to the Accelerated B.S. in Biology / P.S.M. in Biotechnology program are encouraged to contact the P.S.M. Program Coordinator prior to applying. Preference will be given to students who have started or intend to complete the Certified Quality Science Professional (<https://www.pathway4ph.org/quality-education/>) (CQSP) micro-credential program.

To apply, students must:

- Complete the Accelerated B.S. in Biology / P.S.M. in Biotechnology online application (<https://forms.gle/WMimLgxryf5bFAXV9/>).
- Submit a statement of purpose and resume as PDF documents to the Program Coordinator. Send the documents in one email and include the student's name and TWU I.D. number with "BS/PSM documents" in the subject line of the email.
- Request letters of recommendation from 2 academic references. Letters should be sent as PDFs on institutional letterhead directly to the Program Coordinator.

- d. Once admitted to the Accelerated Program students must apply to the graduate P.S.M. Program (<https://twu.edu/biotechnology/>). Students cannot enroll in graduate-level coursework until accepted by the Graduate School.

Accelerated Graduate Program Policy Guidelines

Students may apply to the accelerated graduate degree program once they have attained advanced junior standing with at least 72 undergraduate semester credit hours (SCH). Upon admission to an accelerated program, students with senior standing (90 earned SCH) may enroll in graduate courses for credit. Approved courses will apply to both an undergraduate and a graduate degree.

Conditions

- Undergraduate students may enroll in no more than 6 SCH of graduate coursework in each semester or term.
- Minimal criteria for admission will include a cumulative undergraduate GPA of at least 3.0. The program may set higher GPA requirements as outlined on their TWU graduate program website at the time of graduate application.
- Once admitted to an accelerated program, students must maintain a 3.0 GPA throughout the remainder of their baccalaureate degree, or their admission to the accelerated graduate program may be revoked. Academic components may set additional requirements for their programs.

Graduate Application Process

All students must meet the University requirements as outlined in the Admission to the TWU Graduate School (<http://catalog.twu.edu/graduate/graduate-school/admission-graduate-school/>) section of the catalog.

This academic program may have additional graduate admission criteria that must also be completed as outlined on the graduate program's website.

Degree Requirements

Degree requirements listed here are for completion of the undergraduate portion of the accelerated B.S. in Biology/P.S.M. in Biotechnology program. In the final semester of the B.S. in Biology, students must apply for formal admission to the P.S.M. in Biotechnology graduate program and meet all admissions requirements. Please see the Graduate Catalog for a complete list of degree requirements for the P.S.M. in Biotechnology program (<http://catalog.twu.edu/graduate/arts-sciences/biology/professional-science-master-biotechnology/>).

Total Semester Credit Hours (SCH): 121

Major: 45 SCH; **Minor:** 18 SCH

Program Code: BIOTECH.PSM.ACC **CIP Code:** 26.0101.00

Lecture and lab must be taken concurrently. A minimum grade of C is mandatory in all required courses for Biology majors.

Texas Core Curriculum

Code	Title	SCHs
ENG 1013	Composition I	3
ENG 1023	Composition II	3
Mathematics		3
Life & Physical Sciences		6

Language, Philosophy, & Culture		3
Creative Arts		3
HIST 1013	History of the United States, 1492-1865	3
HIST 1023	History of the United States, 1865 to the Present	3
POLS 2013	U.S. National Government	3
POLS 2023	Texas Government	3
Social & Behavioral Sciences		3
CAO: Women's Studies		3
CAO: First Year Seminar, Wellness or Mathematics		3
Total SCHs		42

Courses Required for Major

Code	Title	SCHs
BIOL 2113 & BIOL 2111	Plant Biology and Plant Biology Laboratory	4
BACT 3113 & BACT 3111	General Microbiology and General Microbiology Laboratory	4
ZOOL 4243 & ZOOL 4241	Medical Physiology and Medical Physiology Laboratory	4
BIOL 4681	Biology Seminar	1
BIOL 4813 & BIOL 4811	Molecular and Cellular Biology: Gene Expression and Molecular and Cellular Biology: Gene Expression Laboratory	4
BIOL 4823 & BIOL 4821	Molecular and Cellular Biology: Genetics and Inheritance and Molecular and Cellular Biology: Genetics and Inheritance Laboratory	4
Biology Undergraduate Electives		4
Graduate Requirements in the Fourth Year		12
BIOL 5293	Advanced Scientific Communication	
BIOL 5543 or BIOL 5903	Advanced Genome Editing and Medical Ethics Special Topics	
BIOL 5503	Research Methods	
BUS 5013	Foundations in Business	
Total SCHs		37

Departmental Requirements

Code	Title	SCHs
BIOL 1113 & BIOL 1111	Principles of Biology I and Principles of Biology I Laboratory	4
BIOL 1123 & BIOL 1121	Principles of Biology II and Principles of Biology II Laboratory	4
Choose one of the following:		4
CHEM 1113 & CHEM 1111	General Chemistry I and General Chemistry Laboratory I	
CHEM 1213 & CHEM 1211	Principles of Chemistry I and Principles of Chemistry Laboratory I	
Choose one of the following:		4
CHEM 1123 & CHEM 1121	General Chemistry II and General Chemistry Laboratory II	
CHEM 1223 & CHEM 1221	Principles of Chemistry II and Principles of Chemistry Laboratory II	

CHEM 2213 & CHEM 2211	Organic Chemistry I and Organic Chemistry Laboratory I	4
CHEM 3223 & CHEM 3221	Organic Chemistry II and Organic Chemistry Laboratory II	4
MATH 1303 or MATH 2014	College Algebra Calculus I	3-4
MATH 1703	Elementary Statistics I	3
Choose one of the following:		4
PHYS 1133 & PHYS 1131	Principles of Physics I and Principles of Physics Laboratory I	
PHYS 2153 & PHYS 2151	General Physics I and General Physics Laboratory I	
Choose one of the following:		4
PHYS 1143 & PHYS 1141	Principles of Physics II and Principles of Physics Laboratory II	
PHYS 2163 & PHYS 2161	General Physics II and General Physics Laboratory II	
Electives/Minor		18
Total SCHs		56-57

Plan of Study

This plan of study is for completion of the undergraduate portion of the accelerated B.S. in Biology/P.S.M. in Biotechnology program. In the final semester of the B.S. in Biology, students must apply for formal admission to the P.S.M. in Biotechnology graduate program and meet all admissions requirements. Please see the Graduate Catalog for a complete list of degree requirements for the P.S.M. in Biotechnology program (<http://catalog.twu.edu/graduate/arts-sciences/biology/professional-science-master-biotechnology/>).

First Year

Fall	TCCN	SCHs
BIOL 1113 & BIOL 1111	Principles of Biology I and Principles of Biology I Laboratory	BIOL 1406 & BIOL 1106 4
CHEM 1113 & CHEM 1111	General Chemistry I and General Chemistry Laboratory I	CHEM 1311 & CHEM 1111 4
MATH 1303	College Algebra	MATH 1314 3
ENG 1013	Composition I	ENGL 1301 3
UNIV 1231	Learning Frameworks: The First Year Experience	EDUC 1100, EDUC 1200, EDUC 1300 1
SCHs		15
Spring	TCCN	
BIOL 1123 & BIOL 1121	Principles of Biology II and Principles of Biology II Laboratory	BIOL 1407 & BIOL 1107 4
CHEM 1123 & CHEM 1121	General Chemistry II and General Chemistry Laboratory II	CHEM 1312 & CHEM 1112 4
HIST 1013	History of the United States, 1492-1865	HIST 1301 3
ENG 1023	Composition II	ENGL 1302 3
Elective		2
SCHs		16

Second Year

Fall	TCCN	
BIOL 2113 & BIOL 2111	Plant Biology and Plant Biology Laboratory	BIOL 1411 & BIOL 1111 4
CHEM 2213 & CHEM 2211	Organic Chemistry I and Organic Chemistry Laboratory I	CHEM 2323 & CHEM 2123 4
POLS 2013	U.S. National Government	GOVT 2305 3
MATH 1703	Elementary Statistics I	MATH 1342 3
SCHs		14
Spring	TCCN	
BACT 3113 & BACT 3111	General Microbiology and General Microbiology Laboratory	4
CHEM 3223 & CHEM 3221	Organic Chemistry II and Organic Chemistry Laboratory II	4
POLS 2023	Texas Government	GOVT 2306 3
Creative Arts Core Course		3
SCHs		14

Third Year

Fall	TCCN	
BIOL 4813 & BIOL 4811	Molecular and Cellular Biology: Gene Expression and Molecular and Cellular Biology: Gene Expression Laboratory	4
Biography Elective		4
Multicultural Women's Studies CAO Core		3
Minor Elective		3
General or Minor Elective		3
SCHs		17
Spring	TCCN	
BIOL 4823 & BIOL 4821	Molecular and Cellular Biology: Genetics and Inheritance and Molecular and Cellular Biology: Genetics and Inheritance Laboratory	4
ZOOL 4243 & ZOOL 4241	Medical Physiology and Medical Physiology Laboratory	4
HIST 1023	History of the United States, 1865 to the Present	HIST 1302 3
Language, Philosophy, & Culture Core		3
SCHs		14

Fourth Year

Fall	TCCN	
PHYS 1133 & PHYS 1131	Principles of Physics I and Principles of Physics Laboratory I	PHYS 1301 & PHYS 1101 4
BIOL 4681	Biology Seminar	1
BIOL 5293	Advanced Scientific Communication	3
BUS 5013	Foundations in Business	3
Upper-level General or Minor Elective		4
SCHs		15
Spring	TCCN	
PHYS 1143 & PHYS 1141	Principles of Physics II and Principles of Physics Laboratory II	PHYS 1302 & PHYS 1102 4

BIOL 5503	Research Methods	3
BIOL 5903	Special Topics	3
	Global Perspectives Elective	3
	Social & Behavioral Science Core	3
	SCHs	16
	Total SCHs:	121