

# B.S. IN CHEMISTRY/ BIOCHEMISTRY (6-12 PHYSICAL SCIENCE TEACHER CERTIFICATION)

**Web Site:** <https://twu.edu/chemistry-biochemistry/undergraduate-programs/bs-in-chemistrybiochemistry-with-teacher-certification/>

Our flexible undergraduate degree plan with teacher certification combines liberal arts study with a chemistry/biochemistry concentration, teacher education coursework, and hands-on student teaching experience. This plan allows you to major in chemistry while also pursuing your teacher certification and a specialization in an almost unlimited number of other areas, such as business, journalism, biology, mathematics, nutrition, or computer science. We offer two options for certification: teacher certification in physical science for grades 6-12, and teacher certification in science for grades 7-12.

## Marketable Skills

Defined by the Texas Higher Education Coordinating Board's 60x30 Strategic Plan (<https://reportcenter.highered.texas.gov/agency-publication/miscellaneous/theqb-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."

## Degree Skills

1. As a member of an undergraduate teaching lab team and research team, you will learn how to work and communicate with diverse team members.
2. Writing laboratory reports, papers, senior theses coupled with presenting your work to your peers, at conferences, or to the general public, you will gain valuable verbal and written communication skills.
3. With our departmental focus on civic engagement and laboratory safety as our first priority, you will understand social and personal responsibility.
4. Earning a degree in any field of chemistry naturally requires excellent problem solving and critical thinking skills related to chemistry, these skills can also be used to address other issues and solve other problems.

## Teacher Certification Skills

1. Appropriately explain the impact of effective planning and communication (within the chosen area of concentration) to relevant internal and external stakeholders in an education or community setting.
2. Identify, select, and implement entry-level instructional plans when serving as an instructor in the school setting.
3. Successfully manage organizational and student behavior when teaching in the school setting.
4. Efficiently and accurately assess student progress and use data to develop and modify instruction for K-12 students.

5. Work effectively and collaboratively with students and families from diverse backgrounds.

## Admissions

### Teacher Certification

#### Application Deadlines

There are three application periods per year (Fall, Spring, and Summer). Students must have their applications in by the deadline the semester before they intend to take ECE 3223 (EC-3 only), EDUC 3003, EDUC 3482, or READ 4223 (EC-3 only). (see schedule below).

#### Spring Application Deadlines\* (Admission to the EDUC 3000s Summer)

- May 1 - Deadline to apply for Summer admission
- May 31 - Deadline for Transfer Grades, Grade Changes, or Any Other Requirement

#### Summer Application Deadlines (Admission to the EDUC 3000s Fall)

- July 1 - Deadline to apply for Fall admission
- July 31 - Deadline for Transfer Grades, Grade Changes, or Any Other Requirement

#### Fall Application Deadlines\* (Admission to the EDUC 3000s Spring)

- December 1 - Deadline to apply for Spring admission
- December 21 - Deadline for Transfer Grades, Grade Changes, or Any Other Requirement

## Guidelines

Please adhere to the following guidelines:

- We recommend preparing your application well in advance of the deadline. That way you will be able to identify and resolve any potential issues before the deadline date.
- If you intend to register early for ECE 3223 (EC-3 only), EDUC 3003, EDUC 3482, or READ 4223 (EC-3 only) for the Summer or Fall semesters and have met all admission requirements, it is recommended that you apply to the EPP by December 1.
- If you apply for admission to the Educator Preparation Program while enrolled in EDUC 2003 or are taking coursework to increase your GPA to a 2.75, the Office of Educator Preparation Services will process your application. If the GPA requirement, along with all other admission requirements are met at the end of the semester, an admission decision will be made at that time.
- No late applications will be accepted. If the deadline date falls on a weekend or a day that TWU is closed, applications will be accepted until 5 p.m. on the next day that TWU is open after the deadline day.

## Requirements

In addition to the general undergraduate admissions requirements (<https://catalog.twu.edu/undergraduate/admission-information/>), to obtain acceptance into the undergraduate Educator Preparation Program (<https://twu.edu/epp/>) (and prior to taking ECE 3223 (EC-3 only), EDUC 3003, EDUC 3482, EDUC 4113, EDUC 4243, READ 4223 (EC-3 only), and Clinical Student Teaching) students must have:

- A cumulative GPA of 2.75 (includes **all** courses, whether posted to TWU transcript or used on a degree plan. Excludes developmental and repeated courses);
- Demonstrated basic skills in reading, written communication, and mathematics by meeting the requirements of the Texas Success Initiative;

- A minimum of 12 to 15 semester credit hours in the subject-specific content area for the certification sought;
- Completed EDUC 2003 with a C or higher;
- Completed department application for admission to the Educator Preparation Program in Tk20;
  - **Important:** Purchase and creation of a Tk20 account is required (<https://twu.edu/epp/tk20/>)
- Completed the Digital Literacy Pre-assessment;
- Submitted a non-refundable Texas Education Agency Fee;
- Completed a Commitment Contract acknowledging awareness and understanding of the Professional Dispositions Policy and Educators' Code of Ethics;
- Successfully completed a pre-admission departmental interview with an interview panel; and
- Acknowledged and accepted admission to the Educator Preparation Program.

**Please note:**

- All accepted students must maintain the admission requirements to remain in the TWU Education Preparation Program.
- Admission requirements are determined by Texas Education Agency policies and are subject to change without notice.
- Students seeking Bilingual certification must meet minimum proficiency in Spanish.
- Students seeking Deaf/Hard of Hearing certification must meet minimum proficiency in sign.

All admission decisions are based on the successful completion of the above requirements. Conviction of a felony or misdemeanor other than a minor traffic violation may affect certification. Additional information may be obtained by contacting the Texas Education Agency (<http://www.tea.texas.gov/>). Any previous or current issues of academic dishonesty, disruptive behavior, or professional dispositions infractions at TWU, another university, or another Educator Preparation Program may result in denial of admission. Any decision may be appealed by contacting the Office of Educator Preparation Services at 940-898-2829.

Contact the Office of Educator Preparation Services (<https://twu.edu/epp/>) (OEPS) at [copeadvising@twu.edu](mailto:copeadvising@twu.edu) or 940-898-2829 with any questions.

**Texas Administrative Code (TAC) Requirements**

- Candidates must undergo a criminal history background check prior to employment as an educator. [19 TAC §227.1(b)(1)]
- Candidates must undergo a criminal history background check prior to clinical teaching. [19 TAC §227.1(b)(2)]
- The potential ineligibility of an individual who has been convicted of an offense for issuance of a certificate. [19 TAC §227.1(d)(1)]
- The right to request a preliminary criminal history evaluation from TEA. [19 TAC §227.1(d)(3)]

**Degree Requirements**

**Total Semester Credit Hours (SCH): 21**

**Major:** 33 SCH; **Required Minor:** 26 SCH

**Program Code:** CHEMISTRY.BS.PHYSED; **CIP Code:** 40.0501.00

**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
<b>Total SCHs</b>		<b>42</b>

**Courses Required for Major**

Code	Title	SCHs
CHEM 1213 & CHEM 1211	Principles of Chemistry I and Principles of Chemistry Laboratory I	4
CHEM 1223 & CHEM 1221	Principles of Chemistry II and Principles of Chemistry Laboratory II	4
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
CHEM 3333 & CHEM 3331	Quantitative Chemical Analysis and Quantitative Chemical Analysis Laboratory	4
CHEM 3413 & CHEM 3411	Physical Chemistry I and Physical Chemistry Laboratory I	4
CHEM 3423 & CHEM 3421	Physical Chemistry II and Physical Chemistry Laboratory II	4
CHEM 3633 & CHEM 3632	Biochemistry I and Biochemistry I Laboratory	5
<b>Total SCHs</b>		<b>33</b>

**Departmental Requirements**

Code	Title	SCHs
BIOL 4593	Science in the Secondary Classroom	3
MATH 2014	Calculus I (may be applied from core)	4
MATH 2024	Calculus II	4
PHYS 2153 & PHYS 2151	General Physics I and General Physics Laboratory I (may be applied from core)	4
PHYS 2163 & PHYS 2161	General Physics II and General Physics Laboratory II (may be applied from core)	4
SCI 1114	Sustainable Physical Science	4

SCI 2113	Earth Science: Global Perspectives	3
SCI 3133	Climate Change: A Human Perspective	3
<b>Total SCHs</b>		<b>29</b>

## Professional Education Studies

Admission to the Educator Preparation Program is required. Students must apply for admission into the Educator Preparation Program prior to enrolling in EDUC 3003/EDUC 3482, EDUC 4113/EDUC 4243, and EDUC 4946. Information is available from the Office of Educator Preparation Services (<https://twu.edu/teacher-certification/>).

Code	Title	SCHs
<b>Pedagogical and Professional Responsibility</b>		
EDUC 2003	Schools and Society	3
EDUC 3003	Learning Theory and Development	3
EDUC 3482	Teaching Diverse Learners Through Technology Integration	2
EDUC 4113	Design and Implementation of Instruction and Assessment	3
EDUC 4243	Classroom Environment and Management	3
EDUC 4946	Clinical Student Teaching	6
<b>Related Studies in Education</b>		
READ 3013	Literacy and Learning across the Curriculum	3
EDSP 3203	Learners with Exceptionalities	3
<b>Total SCHs</b>		<b>26</b>

Notes:

- EDUC 2003 may be taken at a community college. Check with the Office of Educator Preparation Services (<https://twu.edu/teacher-certification/>) to make sure the course has the equivalent number.
- EDUC 4113 and EDUC 4243 must be taken during the same semester.

## Recommended Plan of Study

### First Year

Fall	TCCN	SCHs
CHEM 1213 Principles of Chemistry I & CHEM 1211 and Principles of Chemistry Laboratory I		4
MATH 2014 Calculus I	MATH 2413	4
ENG 1013 Composition I	ENGL 1301	3
HIST 1013 History of the United States, 1492-1865	HIST 1301	3
UNIV 1231 Learning Frameworks: the First-Year Seminar	EDUC 1100, EDUC 1200, EDUC 1300	1
Wellness/Mathematics CAO Core		2
<b>SCHs</b>		<b>17</b>

### Spring

TCCN	SCHs
CHEM 1223 Principles of Chemistry II & CHEM 1221 and Principles of Chemistry Laboratory II	4
MATH 2024 Calculus II	MATH 2414
ENG 1023 Composition II	ENGL 1302
HIST 1023 History of the United States, 1865 to the Present	HIST 1302

Multicultural Women's Studies Core CAO	3
<b>SCHs</b>	<b>17</b>

### Second Year

Fall	TCCN
CHEM 2213 Organic Chemistry I & CHEM 2211 and Organic Chemistry Laboratory I	CHEM 2323 & CHEM 2123
PHYS 2153 General Physics I & PHYS 2151 and General Physics Laboratory I	PHYS 2325 & PHYS 2125
POLS 2013 U.S. National Government	GOVT 2305
Creative Arts Core	3
Language, Philosophy, & Culture Core	3

<b>SCHs</b>	<b>17</b>
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### Spring

TCCN
CHEM 3223 Organic Chemistry II & CHEM 3221 and Organic Chemistry Laboratory II
PHYS 2163 General Physics II & PHYS 2161 and General Physics Laboratory II
POLS 2023 Texas Government
CHEM 3333 Quantitative Chemical Analysis & CHEM 3331 and Quantitative Chemical Analysis Laboratory
Social/Behavioral Core

<b>SCHs</b>	<b>18</b>
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### Third Year

Fall	TCCN
EDUC 2003 Schools and Society	EDUC 1301
CHEM 3633 Biochemistry I & CHEM 3632 and Biochemistry I Laboratory	5
CHEM 3413 Physical Chemistry I & CHEM 3411 and Physical Chemistry Laboratory I	4
SCI 1114 Sustainable Physical Science	PHYS 1415

<b>SCHs</b>	<b>16</b>
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### Spring

TCCN
EDUC 3003 Learning Theory and Development
EDUC 3482 Teaching Diverse Learners Through Technology Integration
CHEM 3423 Physical Chemistry II & CHEM 3421 and Physical Chemistry Laboratory II
SCI 2113 Earth Science: Global Perspectives
SCI 3133 Climate Change: A Human Perspective
GEOL 1401

<b>SCHs</b>	<b>15</b>
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### Fourth Year

Fall	TCCN
EDUC 4113 Design and Implementation of Instruction and Assessment	3
EDUC 4243 Classroom Environment and Management	3
BIOL 4593 Science in the Secondary Classroom	3
READ 3013 Literacy and Learning across the Curriculum	3

EDSP 3203	Learners with Exceptionalities	3
	<b>SCHs</b>	<b>15</b>
<b>Spring</b>	<b>TCCN</b>	
EDUC 4946	Clinical Student Teaching	6
	<b>SCHs</b>	<b>6</b>
	<b>Total SCHs:</b>	<b>121</b>