Chemistry with Teaching, B.S.

Learn more about the Bachelor of Science in Chemistry with Teaching (https://www.temple.edu/academics/degree-programs/chemistry-with-teaching-major-st-chtc-bs).

The B.S. with Teaching in Chemistry is part of Temple’s innovative "TUteach" secondary education teacher-training program. The B.S. with Teaching provides broad training in chemistry and prepares students for a career in secondary school teaching, graduate study or an entry level position as a chemist. The education courses in the B.S. with Teaching include supervised teaching in school district classrooms and emphasize inquiry-based approaches to learning. Students in the B.S. with Teaching degree program become eligible for a Pennsylvania teacher certification when they complete all the requirements for the degree that include theoretical and practical courses in education specifically designed for science and mathematics majors. In order to be recommended for Pennsylvania teacher certification, students must graduate with:

1. a B.S. with Teaching degree
2. meet GPA and testing requirements of the state of Pennsylvania.

Students will be scheduled once each semester to meet with the TUteach advisor to insure that students have knowledge of academic programming, internships opportunities, and testing options that include test preparation. The state of Pennsylvania has specific candidacy requirements. The TUteach advisor will also help the students complete and submit the candidacy documents. All students joining the program in their freshman year must complete the PAPA examination or acquire the PAPA waiver within their first 72 credits. Transfer students, from within Temple and those from other institutions, will build a tailored program with the academic and testing benchmarks structured for efficient degree completion with the TUteach advisor. Students are encouraged to complete the appropriate PRAXIS II examination prior to student teaching. Students are encouraged to take internship courses to expand their teaching portfolio or select elective courses that will extend their knowledge of science and teaching practice.

Undergraduate Contact Information:

Susan Varnum, Program Director
Professor of Chemistry
Associate Dean for Science Education
College of Science and Technology
629 Gladfelter Hall
215-204-6390 or 215-204-4073
susan.varnum@temple.edu

George Mehler, Master Teacher/Faculty Advisor (Science Education)
Assistant Professor
College of Science and Technology
628 Gladfelter Hall
215-204-4074
george.mehler@temple.edu

Kenneth Ruff, TUteach Faculty Advisor, Academic Programs Director
Assistant Professor
College of Science and Technology
656 Gladfelter Hall
215-204-3628
kruff@temple.edu

Dr. Dan Strongin, Chair
Beury Hall, Room 130
215-204-7118

Dr. Steven Fleming, Faculty Advisor (Last names A-C), Chemistry Content
Beury Hall, Room 344
215-204-0359
sfleming@temple.edu

Dr. Roy Keyer, Faculty Advisor (Last names D-G), Chemistry Content
Beury Hall, Room 440
215-204-7286
roy.keyer@temple.edu

Dr. Spiridoula Matsika, Faculty Advisor (Last names H-K), Chemistry Content
Beury Hall, Room 242
Summary of Requirements for the Degree

1. University Requirements (124 total s.h.)
   • MATH 0701 (4 s.h.) and/or ENG 0701 (4 s.h.), if required by placement testing.
   • All Temple students must take a minimum of two writing-intensive courses at Temple as part of their major. Following is a list of courses that can be used to satisfy the writing-intensive requirement:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 4196</td>
<td>Techniques of Chemical Measurement II</td>
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<tr>
<td>CHEM 3397&amp; CHEM 3398</td>
<td>Physical Chemistry Laboratory I and Physical Chemistry Laboratory II</td>
<td></td>
</tr>
<tr>
<td>PHIL 2196</td>
<td>Perspectives on Science and Mathematics</td>
<td></td>
</tr>
<tr>
<td>SECE 3796</td>
<td>Differentiated Literacy Instruction in the Disciplines, 7-12</td>
<td></td>
</tr>
</tbody>
</table>

   • Students must complete the General Education (GenEd) requirements.
   • See the General Education (http://bulletin.temple.edu/undergraduate/general-education) section of the Undergraduate Bulletin for the GenEd curriculum.
   • Students who complete TUteach majors typically receive a waiver for 1 Human Behavior (GB), 2 Science & Technology (GS) and 1 Quantitative Literacy (GQ) GenEd courses.
   • Students must satisfy general Temple University residency requirements (http://bulletin.temple.edu/undergraduate/academic-policies/academic-residency-requirements).

2. College Requirements
   • 90 credits within the College of Science & Technology (CST) or the College of Liberal Arts (CLA).
   • 45 Upper-Level (2000+) credits within the College of Science & Technology (CST) or the College of Liberal Arts (CLA).
   • First Year Seminar Requirement: All students in the College of Science & Technology (CST) are required to take a 1 credit first year seminar course, SCTC 1001 CST First Year Seminar. Other courses that fulfill this requirement may be found on the CST College Requirements (http://bulletin.temple.edu/undergraduate/science-technology/#collegerequirementstext) page. Only one course in this category may count towards graduation.

3. Major Requirements for Bachelor of Science (84-85 s.h.)
   At least 9 courses required for the major must be completed at Temple. At least 5 Chemistry courses and 3 Education courses must be completed at Temple. Though not required, students are strongly encouraged to increase training and field work experience by enrolling in SCTC 1385, SCTC 2385, or SCTC 2389. Students will also benefit from directed laboratory projects offered through SCTC 3185. These courses are offered every semester.
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tr>
<td>&amp; CHEM 1953</td>
<td>and Honors Chemical Science Laboratory I (F)</td>
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<td>CHEM 1032</td>
<td>General Chemistry II</td>
<td>4</td>
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<tr>
<td>&amp; CHEM 1034</td>
<td>and General Chemistry Laboratory II</td>
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<td>CHEM 1952</td>
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<tr>
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<td>and Honors Chemical Science Laboratory II (S)</td>
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<td>CHEM 2201</td>
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<td>&amp; CHEM 2203</td>
<td>and Organic Chemistry Laboratory I</td>
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<td>&amp; CHEM 2213</td>
<td>and Organic Majors Laboratory I (F)</td>
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<td>and Organic Honors Laboratory I (F)</td>
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<td>and Organic Chemistry Laboratory II</td>
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<td>and Organic Majors Laboratory II (S)</td>
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<td>CHEM 3091</td>
<td>Research Methods (S)</td>
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<td>CHEM 3103</td>
<td>Techniques of Chemical Measurement I</td>
<td>4</td>
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<tr>
<td>&amp; CHEM 3105</td>
<td>and Introduction to Chemical Research Techniques</td>
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<tr>
<td>CHEM 3001</td>
<td>Inorganic Chemistry</td>
<td>3</td>
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<td>CHEM 3401</td>
<td>Applications of Biochemistry</td>
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<td>CHEM 4401</td>
<td>Biochemistry I</td>
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<td>CHEM 3301</td>
<td>Physical Chemistry Lecture I</td>
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<td>CHEM 3302</td>
<td>Physical Chemistry Lecture II</td>
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<td>CHEM 4196</td>
<td>Techniques of Chemical Measurement II</td>
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<td>and Physical Chemistry Laboratory II</td>
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<td>or MATH 1941</td>
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<td>MATH 1042</td>
<td>Calculus II</td>
<td>4</td>
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<tr>
<td>or MATH 1942</td>
<td>Honors Calculus II</td>
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<tr>
<td>MATH 2043</td>
<td>Calculus III</td>
<td>4</td>
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<tr>
<td>or MATH 2943</td>
<td>Honors Calculus III</td>
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<td>PHYS 1061</td>
<td>Elementary Classical Physics I</td>
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<td>or PHYS 1961</td>
<td>Honors Elementary Classical Physics I</td>
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<tr>
<td>or PHYS 2021</td>
<td>General Physics I</td>
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<td>or PHYS 2921</td>
<td>Honors General Physics I</td>
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<td>PHYS 1062</td>
<td>Elementary Classical Physics II</td>
<td>4</td>
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<tr>
<td>or PHYS 1962</td>
<td>Honors Elementary Classical Physics II</td>
<td></td>
</tr>
</tbody>
</table>
The certification requirements need to meet Pennsylvania Department of Education standards and are subject to change. All students are strongly recommended to check with the T u teach Advisor in the College of Science and Technology, to affirm the requirements that pertain to their specific major. In addition, students should check the Undergraduate Bulletin web site for the most current information about these programs, or the T u teach web site (https://cst.temple.edu/academics/accelerated-programs/tuteach). It is also recommended that all students meet with an advisor before enrolling in classes specific to these majors and leading to certification as a teacher. This is to assure that a candidate’s intended program of study will be compatible with the new requirements.

All students are required to complete a minimum of one credit.

### Calculation of Major GPA

Courses listed under the major requirements for the degree will be included in the calculation of the major GPA. Courses that could not apply toward the major as an elective or required course would not be counted in the calculation of the major GPA. This would include CHEM 1027, for example.

### Distinction in Major

To graduate with a Distinction in Chemistry with Teaching, students must meet the following requirements:

1. Achieve a 3.50 GPA or better for the aggregate of courses required for the B.S. in Chemistry with Teaching.
2. Achieve a 3.33 GPA or better in all the Chemistry courses in their major.
3. Achieve a 3.90 GPA in the following courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>SCES 2189</td>
<td>Classroom Interactions</td>
<td>3</td>
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<tr>
<td>or SCTC 3485</td>
<td>Science and Mathematics in the Classroom</td>
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</tr>
<tr>
<td>SCES 4189</td>
<td>Project-Based Instruction (F)</td>
<td>3</td>
</tr>
<tr>
<td>or SCTC 4485</td>
<td>Integrating STEM Practice in Diverse Teaching Environments</td>
<td></td>
</tr>
</tbody>
</table>

1. The certification requirements need to meet Pennsylvania Department of Education standards and are subject to change. All students are strongly recommended to check with the T u teach Advisor in the College of Science and Technology, to affirm the requirements that pertain to their specific major. In addition, students should check the Undergraduate Bulletin web site for the most current information about these programs, or the T u teach web site (https://cst.temple.edu/academics/accelerated-programs/tuteach). It is also recommended that all students meet with an advisor before enrolling in classes specific to these majors and leading to certification as a teacher. This is to assure that a candidate’s intended program of study will be compatible with the new requirements.

2. All students are required to complete a minimum of one credit.
Suggested Academic Plan

Bachelor of Science in Chemistry with Teaching

Requirements for New Students starting in the 2019-2020 Academic Year

<table>
<thead>
<tr>
<th>Year 1</th>
<th></th>
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<tr>
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<td>Select one of the following:</td>
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<tr>
<td>CHEM 1031 &amp; CHEM 1033</td>
<td>General Chemistry I</td>
<td>4</td>
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<td>CHEM 1951 &amp; CHEM 1953</td>
<td>Honors General Chemical Science I (F)</td>
<td>4</td>
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<td>MATH 1041 or 1941</td>
<td>Calculus I</td>
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<td>SCTC 1389</td>
<td>Step 1 and 2: Inquiry-Based Lesson Design in Science and Mathematics Modified for English Learners</td>
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<td>Spring</td>
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<tr>
<td>CHEM 1032 &amp; CHEM 1034</td>
<td>General Chemistry II</td>
<td>4</td>
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<td>CHEM 1952 &amp; CHEM 1954</td>
<td>Honors General Chemical Science II (S)</td>
<td>4</td>
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<tr>
<td>MATH 1042 or 1942</td>
<td>Calculus II</td>
<td>4</td>
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<td>Select one of the following:</td>
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<tr>
<td>PHYS 1061</td>
<td>Elementary Classical Physics I</td>
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<td>PHYS 1961</td>
<td>Honors Elementary Classical Physics I (F)</td>
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<td>PHYS 2021</td>
<td>General Physics I</td>
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<td>PHYS 2921</td>
<td>Honors General Physics I (F)</td>
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<td>SPED 2231</td>
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Year 2

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<tr>
<td>CHEM 2201 &amp; CHEM 2203</td>
<td>Organic Chemistry I</td>
<td>4</td>
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<td>CHEM 2211 &amp; CHEM 2213</td>
<td>Organic Chemistry for Majors I (F)</td>
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<td>CHEM 2921 &amp; CHEM 2923</td>
<td>Organic Chemistry for Honors I (F)</td>
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<td>Calculus III</td>
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<td>PHYS 1962</td>
<td>Honors Elementary Classical Physics II (S)</td>
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<tr>
<td>PHYS 2022</td>
<td>General Physics II</td>
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<td>PHYS 2922</td>
<td>Honors General Physics II (S)</td>
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<td>EDUC 2179</td>
<td>Knowing and Learning in Mathematics and Science</td>
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Spring

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<td>&amp; CHEM 2204</td>
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<td>CHEM 2212</td>
<td>Organic Chemistry for Majors II (S)</td>
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<td>&amp; CHEM 2214</td>
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<tr>
<td>CHEM 2922</td>
<td>Organic Chemistry for Honors II (S)</td>
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<td>&amp; CHEM 2924</td>
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<tr>
<td>SECE 3796</td>
<td>Differentiated Literacy Instruction in the Disciplines, 7-12 [WI]</td>
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General Education/Elective Credits 10

**Year 3**

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<tr>
<td>CHEM 3103</td>
<td>Techniques of Chemical Measurement I 3</td>
</tr>
<tr>
<td>CHEM 3105</td>
<td>Introduction to Chemical Research Techniques 1</td>
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<tr>
<td>CHEM 3301</td>
<td>Physical Chemistry Lecture I 3</td>
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<td>Select one of the following:</td>
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<td>PHIL 2196</td>
<td>Perspectives on Science and Mathematics [WI]</td>
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<td>SCTC 3001</td>
<td>History of Science</td>
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General Education/Elective Credits 7

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<tbody>
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<tr>
<td>CHEM 3091</td>
<td>Research Methods (S) 3</td>
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<td>CHEM 3302</td>
<td>Physical Chemistry Lecture II 3</td>
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<td>CHEM 3001</td>
<td>Inorganic Chemistry</td>
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<td>CHEM 3401</td>
<td>Applications of Biochemistry</td>
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<td>CHEM 4401</td>
<td>Biochemistry I</td>
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<td>Select one of the following:</td>
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<td>SCES 2189</td>
<td>Classroom Interactions (S)</td>
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General Education/Elective Credits 5

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<td>CHEM 4196</td>
<td>Techniques of Chemical Measurement II [WI]</td>
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<td>CHEM 3397</td>
<td>Physical Chemistry Laboratory I [WI]</td>
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<td>&amp; CHEM 3398</td>
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<td>Project-Based Instruction (F)</td>
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<td>SCTC 4485</td>
<td>Integrating STEM Practice in Diverse Teaching Environments</td>
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<tr>
<td>SCTC 3312</td>
<td>Coding STEM Lessons&lt;sup&gt;1&lt;/sup&gt;</td>
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General Education/Elective Credits 9-8

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<td>EDUC 4802</td>
<td>TUteach Apprentice Teaching Seminar 1</td>
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General Education/Elective Credits 1

**Total Credit Hours:** 124

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<sup>1</sup> All students are required to complete a minimum of one credit.
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<td>(S)</td>
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(F) - Fall only course
(S) - Spring only course