Mathematics & Computer Science with Teaching, B.S.

Learn more about the Bachelor of Science in Mathematics and Computer Science with Teaching.

The B.S. with Teaching in Mathematics and Computer Science is part of Temple's innovative "TUteach" teacher-training program. The B.S. with Teaching provides broad training in mathematics and computer science and prepares students for a career in secondary school teaching or an entry level position in a mathematics field or computer science. The education courses in the B.S. with Teaching include supervised teaching in school district classrooms and emphasis on 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 ensure 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.

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Department of Mathematics
Wachman Hall, Room 610
Summary of Requirements for the Degree

1. University Requirements (124 total s.h.)
   - Students must complete all University requirements including those listed below.
   - All Temple students must take a minimum of two writing-intensive courses at Temple as part of their major. The specific writing-intensive course options for this major are:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 3096</td>
<td>Introduction to Modern Algebra</td>
<td></td>
</tr>
<tr>
<td>MATH 4096</td>
<td>Senior Problem Solving</td>
<td></td>
</tr>
<tr>
<td>MGSE 3796</td>
<td>Differentiated Literacy Instruction in the Disciplines (grades 7-12)</td>
<td></td>
</tr>
</tbody>
</table>

   - Students must complete the General Education (GenEd) requirements.
     - See the General Education section of the Undergraduate Bulletin for the GenEd curriculum.
     - Students who complete TUteach majors 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.

2. College Requirements

   - 45 Upper Level (2000+) credits within the College of Science & Technology (CST), the College of Liberal Arts (CLA), or the College of Engineering (ENG).

   - 90 credits within the College of Science & Technology (CST), the College of Liberal Arts (CLA), or the College of Engineering (ENG).

   - All students in the College of Science and Technology are required to take a one credit first year seminar. SCTC 1001 CST First Year Seminar is the appropriate course option for every entering first year CST major. Transfer students should use SCTC 2001 CST Transfer Seminar to fulfill this requirement. Other courses that fulfill this requirement may be found on the CST College Requirements page.

3. Major Requirements for Bachelor of Science (97-99 s.h.)

   At least 10 courses required for the major must be completed at Temple. At least 6 Math, 2 Computer Science, 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.

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<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>CIS 1068</td>
<td>Program Design and Abstraction</td>
<td>4</td>
</tr>
<tr>
<td>or CIS 1968</td>
<td>Honors Program Design and Abstraction</td>
<td></td>
</tr>
<tr>
<td>CIS 1166</td>
<td>Mathematical Concepts in Computing I</td>
<td>4</td>
</tr>
<tr>
<td>or CIS 1966</td>
<td>Honors Mathematical Concepts in Computing I</td>
<td></td>
</tr>
<tr>
<td>CIS 2107</td>
<td>Computer Systems and Low-Level Programming</td>
<td>4</td>
</tr>
<tr>
<td>CIS 2168</td>
<td>Data Structures</td>
<td>4</td>
</tr>
</tbody>
</table>
MATH 1041 \quad Calculus I \quad 4
or MATH 1941 \quad Honors Calculus I

MATH 1042 \quad Calculus II \quad 4
or MATH 1942 \quad Honors Calculus II

MATH 2021 \quad Functions and Modeling (S) \quad 3

MATH 2043 \quad Calculus III \quad 4
or MATH 2943 \quad Honors Calculus III

MATH 2061 \quad Euclidean Geometry (S) \quad 3

MATH 2101 \quad Linear Algebra \quad 3-4
or MATH 2103 \quad Linear Algebra with Computer Lab

MATH 2111 \quad Basic Concepts of Math \quad 3

MATH 3003 \quad Theory of Numbers \quad 3-4
or CIS 2166 \quad Mathematical Concepts in Computing II

Physics

PHYS 1061 \quad Elementary Classical Physics I \quad 4
or PHYS 1961 \quad Honors Elementary Classical Physics I
or PHYS 2021 \quad General Physics I
or PHYS 2921 \quad Honors General Physics I

PHYS 1062 \quad Elementary Classical Physics II \quad 4
or PHYS 1962 \quad Honors Elementary Classical Physics II
or PHYS 2022 \quad General Physics II
or PHYS 2922 \quad Honors General Physics II

College of Science & Technology

SCTC 1013 \quad Elements of Data Science for the Physical and Life Sciences \quad 3
SCTC 1389 \quad Step 1 and 2: Inquiry-Based Lesson Design in Science and Mathematics Modified for English Learners \quad 2
SCTC 3001 \quad History of Science \quad 3
SCTC 3312 \quad Coding STEM Lessons \quad 1

Education

EDUC 2179 \quad Knowing and Learning in Mathematics and Science \quad 3
EDUC 4388 \quad TUteach Apprentice Teaching \quad 6
EDUC 4802 \quad TUteach Apprentice Teaching Seminar \quad 1

MGSE 2189 \quad Classroom Interactions (S) \quad 3
or SCTC 3485 \quad Science and Mathematics in the Classroom

MGSE 3796 \quad Differentiated Literacy Instruction in the Disciplines (grades 7-12) \quad 3

MGSE 4189 \quad Project-Based Instruction (F) \quad 3
or SCTC 4485 \quad Integrating STEM Practice in Diverse Teaching Environments

SPED 2231 \quad Introduction to Special Education \quad 3

Research Methods

BIOL/CHEM/EES/PHYS 3091 \quad Research Methods \quad 3

Total Credit Hours \quad 97-99

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<th>Credit Hours</th>
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</thead>
</table>

(F) - Fall only course
(S) - Spring only course
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 Tuteach 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 Tuteach web site. 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.

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 MATH 1022, for example.

Distinction in Major

To graduate with a Distinction in Mathematics and Computer Science with Teaching, a student should meet the following requirements:

- Achieve a 3.50 GPA or better for the aggregate of courses required for the B.S. in Mathematics and Computer Science with Teaching.
- Achieve a 3.50 GPA or better in the Mathematics and Computer Science with Teaching content courses required for the major.
- Achieve an overall GPA, including all college-level courses, of at least 3.25.
- Complete MATH 3141, MATH 3142 and MATH 4051 instead of MATH 3137 and MATH 3138, as well as MATH 3098 instead of MATH 3096.
- A student must achieve a GPA of 3.50 or higher in:

<table>
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<tr>
<th>Code</th>
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<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 3141</td>
<td>Advanced Calculus I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 3142</td>
<td>Advanced Calculus II</td>
<td>3</td>
</tr>
<tr>
<td>MATH 3098</td>
<td>Modern Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH 4051</td>
<td>Complex Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Any additional course from the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 3043</td>
<td>Numerical Analysis I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 3044</td>
<td>Numerical Analysis II</td>
<td>3</td>
</tr>
<tr>
<td>MATH 3101</td>
<td>Topics in Modern Algebra</td>
<td>3</td>
</tr>
<tr>
<td>Any 4000-level course other than individual study</td>
<td></td>
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</table>

- Achieve a 3.90 GPA in the following courses:

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<tbody>
<tr>
<td>MAES 2189</td>
<td>Classroom Interactions</td>
<td>3</td>
</tr>
<tr>
<td>or SCTC 3485</td>
<td>Science and Mathematics in the Classroom</td>
<td></td>
</tr>
<tr>
<td>MAES 4189</td>
<td>Project-Based Instruction</td>
<td>3</td>
</tr>
<tr>
<td>or SCTC 4485</td>
<td>Integrating STEM Practice in Diverse Teaching Environments</td>
<td></td>
</tr>
<tr>
<td>EDUC 4802</td>
<td>TUrtech Apprentice Teaching Seminar</td>
<td>1</td>
</tr>
<tr>
<td>EDUC 4388</td>
<td>TUrtech Apprentice Teaching</td>
<td>6</td>
</tr>
</tbody>
</table>

Suggested Academic Plan

Bachelor of Science in Mathematics & Computer Science with Teaching

Requirements for New Students starting in the 2021-2022 Academic Year

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td></td>
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<tr>
<td>CIS 1068 or 1968</td>
<td>Program Design and Abstraction</td>
</tr>
<tr>
<td>MATH 1041 or 1941</td>
<td>Calculus I</td>
</tr>
<tr>
<td>Select one of the following:</td>
<td>4</td>
</tr>
</tbody>
</table>
PHYS 1061  Elementary Classical Physics I
PHYS 1961  Honors Elementary Classical Physics I
PHYS 2021  General Physics I
PHYS 2921  Honors General Physics I
SCTC 1001  CST First Year Seminar 1
SCTC 1389  Step 1 and 2: Inquiry-Based Lesson Design in Science and Mathematics Modified for English Learners 2

Term Credit Hours 15

Spring
CIS 1166 or 1966  Mathematical Concepts in Computing I 4
MATH 1042 or 1942  Calculus II 4
Select one of the following: 4
  PHYS 1062  Elementary Classical Physics II
  PHYS 1962  Honors Elementary Classical Physics II
  PHYS 2022  General Physics II
  PHYS 2922  Honors General Physics II
SCTC 1013  Elements of Data Science for the Physical and Life Sciences 3

Term Credit Hours 15

Year 2
Fall
CIS 2168  Data Structures 4
MATH 2043 or 2943  Calculus III 4
MATH 2101 or 2103  Linear Algebra 3-4
EDUC 2179  Knowing and Learning in Mathematics and Science 3
Elective 3-2

Term Credit Hours 17

Spring
CIS 2107  Computer Systems and Low-Level Programming 4
MATH 2021  Functions and Modeling (S) 3
MATH 2111  Basic Concepts of Math 3
SPED 2231  Introduction to Special Education 3
ENG 0802, 0812, or 0902  Analytical Reading and Writing [GW] 4

Term Credit Hours 17

Year 3
Fall
MATH 3096  Introduction to Modern Algebra [WI] 3
MATH 3137  Real & Complex Analysis I (F) 3
SCTC 3001  History of Science 3
MGSE 3796  Differentiated Literacy Instruction in the Disciplines (grades 7-12) [WI] 3
IH 0851 or 0951  Intellectual Heritage I: The Good Life [GY] 3
GenEd Breadth Course 3

Term Credit Hours 18

Spring
MATH 2061  Euclidean Geometry (S) 3
MATH 3138  Real & Complex Analysis II (S) 3
Select one of the following: 3
  MGSE 2189  Classroom Interactions (S)
  SCTC 3485  Science and Mathematics in the Classroom
Select one of the following: 3
  BIOL 3091  Research Methods (S)
  CHEM 3091  Research Methods (S)
  EES 3091  Research Methods (S)
  PHYS 3091  Research Methods (S)
IH 0852 or 0952  
Intellectual Heritage II: The Common Good [GZ]  

| Term Credit Hours | 15 |

**Year 4**

**Fall**

<table>
<thead>
<tr>
<th>Select one of the following:</th>
</tr>
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<tbody>
<tr>
<td>MATH 3003</td>
</tr>
<tr>
<td>CIS 2166</td>
</tr>
<tr>
<td>MATH 4096</td>
</tr>
<tr>
<td>SCTC 3312</td>
</tr>
</tbody>
</table>

Select one of the following:  

| MGSE 4189  | Project-Based Instruction (F) |
| SCTC 4485  | Integrating STEM Practice in Diverse Teaching Environments |

GenEd Breadth Course  
GenEd Breadth Course  

| Term Credit Hours | 17 |

**Spring**

| EDUC 4388  | TUteach Apprentice Teaching |
| EDUC 4802  | TUteach Apprentice Teaching Seminar |

GenEd Breadth Course  

| Term Credit Hours | 10 |

**Total Credit Hours:**  
124

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<tr>
<td>(F)</td>
<td>Fall only course</td>
<td></td>
</tr>
<tr>
<td>(S)</td>
<td>Spring only course</td>
<td></td>
</tr>
</tbody>
</table>

¹ All students are required to take a minimum of one credit.