MATHEMATICS (BS) - SECONDARY EDUCATION CONCENTRATION

Program Overview

The BS in Mathematics - Secondary Education Track provides a sound foundation in mathematics, as well as course work necessary for teaching certification at the secondary level. As a part of UTeach Columbus (https://uteach.columbusstate.edu/), this program stresses early field experiences, inquiry based lessons, and highly engaged instruction. Education coursework focuses directly on math and science classroom settings.

All educator preparation programs are approved by the Georgia Professional Standards Commission. In addition to the degree requirements, there are further requirements for teaching certification. Visit the Certification page (https://cqtl.columbusstate.edu/certification.php) on the CSU Center for Quality Teaching and Learning (CQTL) website for detailed information about certification requirements and the certification process.

Career Opportunities

Teaching at the secondary level, trade assistant, quantitative analyst

Program of Study

Click on the Program Map tab to view a term-by-term guide for completing the program requirements.

Core Requirements

Code	Title	Credit Hours
Area A Essential Skills		
ENGL 1101	English Composition I (minimum grade of C)	3
ENGL 1102	English Composition II (minimum grade of C)	3
MATH 1113	Pre-Calculus	4
or MATH 1131	Calculus with Analytic Geometry I	
Area A Total		9
Area B Institutional Options [1]		
B1: Select 3 hours of following courses:		3
COMM 1110	Public Speaking	
Any Foreign Language 1001, 1002, 2001, 2002		
B2: Select 1 hour of the following courses:		1
ITDS 1779	Scholarship Across the Disciplines	
LEAD 1705	Introduction to Servant Leadership	
PERS 1506	Perspectives 1-hour	
PERS 1507	Perspectives 2-hour	
Area B Total		4
Area C Humanities/Fine Arts/Ethics		
Select one of the following humanities courses:		3
ENGL 2111	World Literature I	
ENGL 2112	World Literature II	
ITDS 1145	Comparative Arts [2]	
ITDS 1155	The Western Intellectual Tradition	
ITDS 2125	Historical Perspectives on the Philosophy of Science and Mathematics	
PHIL 2010	Introduction to Philosophy	
Select one of the following fine arts courses:		3
ARTH 1100	Art Appreciation	
ITDS 1145	Comparative Arts [2]	
MUSC 1100	Music Appreciation	
THEA 1100	Theatre Appreciation	
ARTH 2125	Introduction to the History of Art I– Prehistoric through Gothic	
ARTH 2126	Introduction to the History of Art II– Renaissance through Modern	
Area C Total		6
Area D Science/Math/Technology [2]		
D1: Select two of the following lab science courses:		8
ASTR 1105 & ASTR 1305	Descriptive Astronomy: The Solar System and Descriptive Astronomy Lab	
ATSC 1112 & 1112L	Understanding the Weather and Understanding the Weather Lab	
BIOL 1215K	Principles of Biology	
BIOL 1225K	Contemporary Issues in Biology with Lab	
CHEM 1211 & 1211L	Principles of Chemistry I and Principles of Chemistry I Lab	
CHEM 1212 & 1212L	Principles of Chemistry II and Principles of Chemistry II Lab	
GEOL 1121	Introductory Geoscience I: Physical Geology	
GEOL 1122 & GEOL 1322	Introductory Geo-sciences II: Historical Geology and Introductory Geo-sciences II: Historical Geology Lab	
GEOL 2225	The Fossil Record	
PHYS 1111 & PHYS 1311	Introductory Physics I and Introductory Physics I Lab	
PHYS 1112 & PHYS 1312	Introductory Physics II and Introductory Physics II Lab	
PHYS 2211 & PHYS 2311	Principles of Physics I and Principles of Physics I Lab	
PHYS 2212 & PHYS 2312	Principles of Physics II and Principles of Physics II Lab	
D2: Select one of the following courses		3
MATH 1131	Calculus with Analytic Geometry I	
MATH 1132	Calculus with Analytic Geometry II	
Area D Total		11
Area E Social Sciences		
HIST 2111	U. S. History to 1865	3
or HIST 2112	U. S. History since 1865	
POLS 1101	American Government	3
Select one of the following behavioral science courses:		3
ECON 2105	Principles of Macroeconomics	
ECON 2106	Principles of Microeconomics	
PHIL 2030	Moral Philosophy	
PSYC 1101	Introduction to General Psychology	
SOCI 1101	Introduction to Sociology	
Select one of the following world culture courses:		3
ANTH 1105	Cultural Anthropology	

ANTH 1107	Discovering Archaeology	
ANTH 2105	Ancient World Civilizations	
ANTH/ENGL 2136	Language and Culture	
GEOG 1101	World Regional Geography	
HIST 1111	World History to 1500	
HIST 1112	World History since 1500	
INTS 2105	Introduction to International Studies and Cross-Cultural Learning	
ITDS 1156	Understanding Non-Western Cultures	
Area E Total		12
Wellness Requirement		
KINS 1106	Lifetime Wellness	2
or PHED 1205	Concepts of Fitness	
Select one PEDS course (https://catalog.columbusstate.edu/course-descriptions/peds/#peds)		1
Wellness Total		3
Total Credit Hours		**45**

[1] Note: Students whose majors require 2 lab science courses in Area D complete Area B and Area D with a combined total of 15 credit hours. Any additional hours may be applied to Area F or beyond, depending on the program of study. Students should consult their advisors.

- Area B1, 3 hours;
- Area B2, 1 hour;
- Area D1, 8 hours;
- Area D2, 3 hours.

[2] ITDS 1145 Comparative Arts, though listed under both humanities and fine arts, may be taken only once.

Major Requirements

Code	Title	Credit Hours
Core Requirements		
Complete the core requirements for this program		45
Core Total		45
Area F Courses Related to Major		
Select the following course (the extra credit is counted in Area G):		3
CPSC 1301K	Computer Science I	
1 Math credit from the following (Area A or D):		1
MATH 1131	Calculus with Analytic Geometry I	
4 Math credits for the following or 1 credit from Area D:		1-4
MATH 1132	Calculus with Analytic Geometry II	
MATH 2115	Introduction to Linear Algebra	3
MATH 2135	Calculus with Analytic Geometry 3	4
STAT 1401	Elementary Statistics	3
Guided Elective [1]		0-3
Area F Total		18
Area G Program Requirements		
1 credit from the following (Area F):		1
CPSC 1301K	Computer Science I	
1 credit if taken for Area A Math:		0-1
MATH 1113	Pre-Calculus	
MATH 3154	Introduction to Mathematical Proofs I	3
MATH 3155	Introduction to Mathematical Proofs II	3
MATH 3175	Introduction to Probability	3
MATH 4795	Senior Seminar in Mathematics	3
MATH 5111U	Introduction to Abstract Algebra I	3
MATH 5135U	College Geometry	3
MATH 5151U	Introduction to Real Analysis I	3
MATH 5175U	Mathematical Statistics	3
MATH 5185U	History of Mathematics	3
UTeach Columbus Teaching Option: [2]		
SPED 4115	Teaching Math and Science to Exceptional Learners (Students must earn a grade of B or better in order to be certified to teach in the state of Georgia.)	2
UTCH 1201	Step I: Inquiry Approaches to Teaching	1
UTCH 1202	Step II: Inquiry-Based Lesson Design	1
UTCH 2105	Knowing and Learning in Mathematics and Science	3
UTCH 2215	Research Methods	3
UTCH 3115	Functions and Modeling for Secondary Mathematics Teachers	3
UTCH 3205	Classroom Interactions	3
UTCH 4205	Project-Based Instruction	3
UTCH 4485	Student Teaching	9
UTCH 4795	Student Teaching Seminar	1
Select one of the following: [3]		0-3
ITDS 2125	Historical Perspectives on the Philosophy of Science and Mathematics	
or UTCH 220	Step III: Technological and Pedagogical Content Knowledge	
Area G Total		57-61
Area H Program Electives		
Select any MATH or STAT courses at the 3000 level or higher		0-3
Area H Total		0-3
Total Credit Hours		**123-124**

[1] Guided elective will be selected from among freshman and sophomore level courses in science, business, and education based upon student interests and career goals and requiring the approval of a faculty advisor and the Mathematics Department Chair.

[2] Only two attempts allowed for each of the following courses.

[3] If ITDS 2125 Historical Perspectives on the Philosophy of Science and Mathematics is not taken in Area C.

Program Map

Course	Title	Credit Hours
First Year		
Fall		
MATH 1113	Pre-Calculus (minimum grade of C)	4
(Apply 3 credits to Area A and 1 credit to Area G.)		
ENGL 1101	English Composition I (minimum grade of C)	3

Area B1	COMM 1110 Public Speaking or Foreign Language	3
UTCH 1201	Step I: Inquiry Approaches to Teaching (minimum grade of C)	1
AREA C	Fine Arts	3
Area B2	ITDS 1779 (2), LEAD 1705 (2), PERS 1506 (1; may be repeated with different topic), PERS 1507 (2)	1
	Credit Hours	**15**
Spring		
MATH 1131	Calculus with Analytic Geometry I (minimum grade of C)	4
(Apply 3 credits to Area D and 1 credit to Area F.)		
ENGL 1102	English Composition II (minimum grade of C)	3
UTCH 1202	Step II: Inquiry-Based Lesson Design (minimum grade of C)	1
AREA D	Lab Science	4
CPSC 1301K	Computer Science I (minimum grade of C)	4
(Apply 3 credits to Area F and 1 credit to Area G.)		
	Credit Hours	**16**
Second Year		
Fall		
MATH 1132	Calculus with Analytic Geometry II (minimum grade of C) [1]	4
MATH 2115	Introduction to Linear Algebra (minimum grade of C)	3
MATH 3154	Introduction to Mathematical Proofs I (minimum grade of C)	3
UTCH 2105	Knowing and Learning in Mathematics and Science (minimum grade of C)	3
AREA E	World Cultures	3
	Credit Hours	**16**
Spring		
STAT 1401	Elementary Statistics (minimum grade of C)	3
MATH 3175	Introduction to Probability (minimum grade of C)	3
MATH 3155	Introduction to Mathematical Proofs II (minimum grade of C)	3
UTCH 3115	Functions and Modeling for Secondary Mathematics Teachers (minimum grade of C)	3
POLS 1101	American Government	3
	Credit Hours	**15**
Third Year		
Fall		
MATH 2135	Calculus with Analytic Geometry 3 (minimum grade of C)	4
MATH 5135U	College Geometry (minimum grade of C)	3
AREA H	Math Elective	2-3
AREA E	Behavioral Science	3
ITDS 2125	Historical Perspectives on the Philosophy of Science and Mathematics [2]	3
	Credit Hours	**15-16**
Spring		
MATH 5185U	History of Mathematics (minimum grade of C)	3
MATH 5111U	Introduction to Abstract Algebra I (minimum grade of C)	3
UTCH 2215	Research Methods (minimum grade of C)	3
UTCH 3205	Classroom Interactions (minimum grade of C)	3
AREA D	Lab Science	4
	Credit Hours	**16**
Fourth Year		
Fall		
MATH 4795	Senior Seminar in Mathematics (minimum grade of C)	3
MATH 5151U	Introduction to Real Analysis I (minimum grade of C)	3
MATH 5175U	Mathematical Statistics (minimum grade of C)	3
UTCH 4205	Project-Based Instruction (minimum grade of C)	3
KINS 1106 or PHED 1205	Lifetime Wellness or Concepts of Fitness	2
PEDS		1
HIST 2111 or HIST 2112	U. S. History to 1865 or U. S. History since 1865	3
	Credit Hours	**18**
Spring		
UTCH 4485	Student Teaching (minimum grade of C)	9
UTCH 4795	Student Teaching Seminar (minimum grade of C)	1
SPED 4115	Teaching Math and Science to Exceptional Learners (minimum grade of C; see note below)	2
There is a recent rule change for certification from the GaPSC. As of July 1, 2019, students must make a B or higher in the Exceptional Children's course. The course could be any of the following depending on your major: SPED 2256, EDCI 6228, KINS 4245, SPED 4115, PHED 6219 This rule change will not affect your graduation but you cannot become a certified educator with the state of Georgia until you receive the grade of B or higher in this course.		
	Credit Hours	**12**
	Total Credit Hours	**123-124**

[1] If MATH 1132 Calculus with Analytic Geometry II is used in Area D, the one extra hour will count in Area F.

[2] If ITDS 2125 Historical Perspectives on the Philosophy of Science and Mathematics is applied to Area G, then choose another course for Area C and take that it in another semester.

Additional Notes

This program map illustrates appropriate coursework for completing a degree within four years, provided that course grades allow for earned credit. Please consult with your advisor to determine when courses

can be switched out with others and taken in a different semester or sequence than illustrated since not all courses are taught every semester.

- This map is for illustrative purposes only and does not constitute a legal contract on the part of CSU since degree requirements or course offerings could change. As always, check with your advisor.
- Students must complete "Area A " (ENGL 1101 English Composition I, ENGL 1102 English Composition II, and MATH 1001 Quantitative Skills and Reasoning or higher) prior to reaching 30 hours and earn a "C" or higher in ENGL 1101 and 1102.
- As of Fall 2013, all undergraduate students are required each semester to meet the 2.0 institutional GPA standard for satisfactory academic progress.

Admission Requirements

During the sophomore year, students intending to complete a teacher education program make formal application to the teacher education program. Normally, this occurs after the student has completed three semesters of full-time course work. For a list of current admission requirements, go to https://cqtl.columbusstate.edu/teacher-education (https://cqtl.columbusstate.edu/teacher-education.php)

Additional Program Requirements

Students must complete all courses related to major with a C or better unless otherwise approved.

For teacher certification, students must obtain a minimum overall and CSU grade point average of 2.5.

Students must meet all requirements for admission to Teacher Education. For a list of current requirements, go to https://cqtl.columbusstate.edu/teacher-education.php

Students must meet all requirements for admission to Student Teaching. For a list of current requirements, go to https://cqtl.columbusstate.edu/student-teaching.php.

To be recommended for teacher certification, students must pass the GACE Mathematics Test I and Test II (for additional information on the GACE, go to https://gace.ets.org/).

Program Learning Outcomes

- an understanding of calculus and an ability to use calculus in applications
- knowledge of algebraic structures
- knowledge of the real numbers, functions, the topological properties of R, differentiation, and integration
- knowledge of and the ability to apply probability density functions
- Knowledge of appropriate mathematical models
- The ability to think critically
- The ability to understand mathematical arguments and to construct mathematical proofs
- The ability to use computational devices and software in problem solving situations
- communication skills to acquire, develop, and convey mathematical knowledge
- Demonstrate proficiency in planning instruction based on standards and knowledge of students
- Demonstrate proficiency in using a wide range of instructional strategies and differentiating instruction to help all students learn
- Demonstrate proficiencies related to assessing learning and teaching and using assessment data to adapt instruction for improved student learning
- Display values, commitments, dispositions, and habits associated with effective and professional teaching