MATHEMATICS (BS) - APPLIED MATHEMATICAL SCIENCES

Program Overview

BS Mathematics - Applied Mathematical Sciences track prepares the student for a career in industry. Provide strong Mathematical foundation combined with study of mathematical and statistical methods applied in fields such as engineering, the physical and life sciences, environmental science, social science, and business.

Career Opportunities

Actuary, banking analyst, financial analyst, quantitative analyst, teacher (with the completion of additional preparation for certification), trade assistant

Program of Study

Code	Title	Credit Hours
Core IMPACTS Area : Institutional Priorities [1]		**4-5**
Choose one of the following communication options		3
COMM 1110	Public Speaking	
Foreign Language Course Options		
AMSL, ARAB, CHIN, FREN, GERM, GREK, ITAL, JAPN, KREN, LATIN, PORT, SPAN - 1001, 1002, 2001, 2002; SWAH - 1001, 1002.		
Take one of the following courses		1-2
ITDS 1779	Scholarship Across the Disciplines	
LEAD 1705	Introduction to Servant Leadership	
PERS 1506	Perspectives 1-hour	
PERS 1507	Perspectives 2-hour	
Core IMPACTS Area : Mathematics & Quantitative Skills [1]		**3-7**
DATA 1501	Introduction to Data Science	3
MATH 1001	Quantitative Skills and Reasoning	3
MATH 1101	Introduction to Mathematical Modeling	3
MATH 1111	College Algebra	3
MATH 1113	Pre-Calculus	4
MATH 1125	Applied Calculus	3
MATH 1131	Calculus with Analytic Geometry I	4
MATH 1132	Calculus with Analytic Geometry II	4
MATH 1165	Computer-Assisted Problem Solving	3
MATH 1401	Introduction to Statistics	3
MATH 1501	Calculus I	4
MATH 2125	Introduction to Discrete Mathematics	3
STAT 1401	Elementary Statistics	3
Core IMPACTS Area : Political Science and U.S. History		**6**
HIST 2111	U. S. History to 1865	3
or HIST 2112	U. S. History since 1865	
POLS 1101	American Government	3
Core IMPACTS Area : Arts, Humanities, and Ethics		**6**
Select one Fine Arts course		3
ARTH 1100	Art 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	
MUSC 1100	Music Appreciation	
THEA 1100	Theatre Appreciation	
ITDS 1145	Comparative Arts [2]	
Select one Humanities course		3
ENGL 2111	World Literature I	
ENGL 2112	World Literature II	
ITDS 1155	The Western Intellectual Tradition	
ITDS 1774	Introduction to Digital Humanities	
PHIL 2010	Introduction to Philosophy	
ITDS 1145	Comparative Arts [2]	
Core IMPACTS Area : Communicating in Writing		**6**
ENGL 1101	English Composition I	3
ENGL 1102	English Composition II	3
Core IMPACTS Area : Technology, Mathematics, and Sciences [1,3]		**7-11**
ANTH 1145	Human Origins	3
ASTR 1105	Descriptive Astronomy: The Solar System	3
ASTR 1106	Descriptive Astronomy: Stars and Galaxies	3
ASTR 1305	Descriptive Astronomy Lab	1
ATSC 1112	Understanding the Weather	3
ATSC 1112L	Understanding the Weather Lab	1
BIOL 1125	Contemporary Issues in Biology Non-Lab	3
BIOL 1215K	Introductory Biology	4
BIOL 1225K	Contemporary Issues in Biology with Lab	4
CHEM 1151 & 1151L	Survey of Chemistry I and Survey of Chemistry I Lab	4
CHEM 1152 & 1152L	Survey of Chemistry II and Survey of Chemistry II Lab	4
CHEM 1211 & 1211L	Principles of Chemistry I and Principles of Chemistry I Lab	4
CHEM 1212 & 1212L	Principles of Chemistry II and Principles of Chemistry II Lab	4
CPSC 1105	Introduction to Computing Principles and Technology	3
CPSC 1301K	Computer Science I	4
ENVS 1105	Environmental Studies	3
ENVS 1105L	Environmental Studies Laboratory	1
ENVS 1205K	Sustainability and the Environment	4
GEOG 2215	Introduction to the Geographic Information Systems	3
GEOL 1110	Natural Disasters: Our Hazardous Environment	3
GEOL 1121	Introductory Geoscience I: Physical Geology	3
GEOL 1121L	Introductory Geoscience I: Physical Geology Lab	1
GEOL 1122	Introductory Geo-sciences II: Historical Geology	3
GEOL 1322	Introductory Geo-sciences II: Historical Geology Lab	1
GEOL 2225	The Fossil Record	4
PHYS 1111 & PHYS 1311	Introductory Physics I and Introductory Physics I Lab	4
PHYS 1112 & PHYS 1312	Introductory Physics II and Introductory Physics II Lab	4

PHYS 1125	Physics of Color and Sound	3
PHYS 1325	Physics of Color and Sound Lab	1
PHYS 2211 & PHYS 2311	Principles of Physics I and Principles of Physics I Lab	4
PHYS 2212 & PHYS 2312	Principles of Physics II and Principles of Physics II Lab	4
Core IMPACTS Area : Social Sciences		**6**
Select one Behavioral Science course		
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 World Cultures course		3
ANTH 1107	Discovering Archaeology	
ANTH 1105	Cultural Anthropology	
ANTH 2105	Ancient World Civilizations	
ANTH 2136	Language and Culture	
ENGL 2136	Language and Culture	
GEOG 1101	World Regional Geography	
HIST 1111	World History to 1500	
HIST 1112	World History since 1500	
ITDS 1156	Understanding Non-Western Cultures	
Core IMPACTS Total Hours		**42**
Health and Wellness		**3**
KINS 1106	Lifetime Wellness	2
or PHED 1205	Concepts of Fitness	
Select one of the following		1
Any PEDS course		
MUSC 1206	Body Mapping (Music Majors Only)	

1 The hours applied in the Institutional Priorities; Mathematics & Quantitative Skills; and Technology, Mathematics, and Sciences areas must add to 18 credit hours.

2 ITDS 1145 Comparative Arts, though listed under both Fine Arts and Humanities, may be taken only once.

3 At least 4 of the credit hours in this area must be in a lab science course.

Major Requirements

Code	Title	Credit Hours
Core Requirements		
Complete the core requirements for this program		45
Core Total		45
Field of Study Requirements		**18**
Select the following course (the extra credit is counted in Required for the Major):		
CPSC 1301K	Computer Science I (One credit hour is counted in Required for Major)	
MATH 1131	Calculus with Analytic Geometry I [1]	
MATH 1132	Calculus with Analytic Geometry II [1]	
MATH 2115	Introduction to Linear Algebra	
MATH 2135	Calculus with Analytic Geometry 3	
STAT 1401	Elementary Statistics	
Guided elective (0 or 3 hours)		
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 adviser and the Mathematics Department Chair		
Required for the Major		**19-20**
CPSC 1301K	Computer Science I (One credit hour from Area F)	
MATH 2125	Introduction to Discrete Mathematics	
MATH 5125U	Discrete Mathematics	
MATH 3175	Introduction to Probability	
MATH 3139	Mathematical Preparation for Business, Industrial, and Government Careers	
MATH 3107	Differential Equations	
MATH 5175U	Mathematical Statistics	
Major Electives		**15**
Select five of the following courses.		
MATH 3106	Mathematical Theory of Interest	
MATH 3108	Introduction to Actuarial Science	
MATH 5126U	Actuarial Regression and Time Series	
FINC 3105	Principles of Finance	
FINC 3115	Corporate Financial Analysis	
STAT 3127	Statistical Computing	
STAT 5177U	Applied Regression Analysis	
STAT 5117U	Applied Multivariate Analysis	
DATA 3111	Data Mining I	
DATA 3112	Data Mining II	
DATA 3116	Ethics and Data Analytics	
DATA 3215	Data Analytics Project	
DATA 4698	Data Analytics Internship	
General Electives Required Hours		**25-26**
Select 9 semester hours of courses at 3000-level or higher AND Select 16-17 hours of courses at 1000-level or higher.		
Recommended for students interested in Actuarial Science:		
ACCT 2101	Principles of Accounting I	
ECON 2105	Principles of Macroeconomics	
ECON 2106	Principles of Microeconomics	
Recommended for students interested in Data Science		
CPSC 1302K	Computer Science II	
CPSC 3131	Database Systems I	
CPSC 2108	Data Structures	
CYBR 2160	Intro to Information Security	
CYBR 4160	Applied Cryptography	
Total Credit Hours		**123**

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 D	Lab Science	4
AREA B1	COMM 1110 Public Speaking or foreign language 1001, 1002, 2001, 2002	3
AREA E	Behavioral Science	3
	Credit Hours	**17**
Spring		
MATH 1131	Calculus with Analytic Geometry I (minimum grade of C)	4
ENGL 1102	English Composition II (minimum grade of C)	3
STAT 1401	Elementary Statistics (minimum grade of C)	3
CPSC 1301K	Computer Science I (minimum grade of C)	4
(Apply 3 credits to Area F and 1 credit to Area G.)		
AREA B2	ITDS 1779 (2), LEAD 1705 (2), PERS 1506 (1; may be repeated with different topic), PERS 1507 (2)	1
	Credit Hours	**15**
Second Year		
Fall		
MATH 1132	Calculus with Analytic Geometry II (minimum grade of C)	4
MATH 2125	Introduction to Discrete Mathematics (minimum grade of C)	3
MATH 2115	Introduction to Linear Algebra (minimum grade of C)	3
AREA C	Humanities Course [2]	3
AREA E	World Cultures	3
	Credit Hours	**16**
Spring		
MATH 3107	Differential Equations (minimum grade of C)	3
MATH 5125U	Discrete Mathematics	3
MATH 3175	Introduction to Probability (minimum grade of C)	3
AREA C	Fine Arts Course	3
MATH 2135	Calculus with Analytic Geometry 3 (minimum grade of C)	4
	Credit Hours	**16**
Third Year		
Fall		
POLS 1101	American Government	3
AREA H	Program Elective (minimum grade of C)	3
MATH 5175U	Mathematical Statistics (minimum grade of C)	3
AREA D	Lab Science	4
KINS 1106 or PHED 1205	Lifetime Wellness or Concepts of Fitness	2
PEDS		1
	Credit Hours	**16**
Spring		
MATH 3139	Mathematical Preparation for Business, Industrial, and Government Careers (minimum grade of C)	3
AREA H	Program Elective (minimum grade of C)	3
AREA H	Program Elective (minimum grade of C)	3
AREA I	General Elective [3]	3
AREA I	Upper Level General Elective [3]	3
	Credit Hours	**15**
Fourth Year		
Fall		
AREA H	Program Elective (minimum grade of C)	3
AREA H	Program Elective (minimum grade of C)	3
AREA I	General Elective [3]	1
AREA I	General Elective [3]	3
AREA I	Upper Level General Elective [3]	3
	Credit Hours	**13**
Spring		
AREA I	Upper Level General Elective [3]	3
AREA I	General Elective [3]	3
AREA I	General Elective [3]	3
AREA I	General Elective [3]	3
HIST 2111 or HIST 2112	U. S. History to 1865 or U. S. History since 1865	3
	Credit Hours	**15**
	Total Credit Hours	**123**

Footnotes

1. If MATH 1132 Calculus with Analytic Geometry II is used in Area D, the one extra hour will count in Area F.
2. ITDS 2125 Historical Perspectives on the Philosophy of Science and Mathematics is recommended for the UTeach program.
3. If an elective course is taken to complete the UTeach program or minor, then a C or better is required.

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 consittute 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 1113 Pre-Calculusor MATH 1131 Calculus with Analytic Geometry I) 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.

The student needs to work with his/her advisor to choose appropriate elective courses to make sure that he/she meets the total hours required for the program (123 or 125-128 with UTeach).

Admission Requirements

There are no program specific admission requirements.

Additional Program Requirements

There are no program specific academic regulations.