MATHEMATICS: SECONDARY CERTIFICATION CONCENTRATION, BACHELOR OF ARTS

Program Goals

- Educate students to effectively use quantitative and analytical methods and the language of mathematics.
- Prepare students for professional careers and graduate studies in areas requiring advanced analytical skills, including actuarial science, computer science, engineering, operations research, biomathematics, cryptography, finance, pure and applied mathematics and teaching.
- Promote a scholarly attitude of mind that enables students to effectively use mathematics with the ability to think critically, synthesize their knowledge and move to higher levels of independent thinking.

Expected Student Outcomes

Upon successful completion of the mathematics major, students will:

- Learn, understand and apply mathematics from the core mathematical disciplines of calculus, abstract algebra, analysis, modeling, differential equations, geometry, probability, and statistics.
- Formulate and solve problems using mathematical tools, while working alone or in groups on routine problems, non-routine and open-ended problems, problems involving applications to other fields, problems involving real-world data, and abstract problems within mathematics.
- Create, analyze and apply mathematical abstraction to real problems by understanding and producing formal mathematical arguments with an appreciation for the mathematical standards of rigor, elegance, and beauty.
- Learn independently, locate and use appropriate sources of technical material, and make use of modern computational tools.
- Produce convincing, precise verbal and written communications of technical material.

Outcomes Assessment Activities

- Faculty advisers meet individually with students on a regular basis to help with schedule planning and to discuss the student's progress toward educational and career goals. Advisers maintain a record of each student's performance in his/her program of study.
- During the senior year, each major takes the Mathematics Field Achievement Test. This test measures a student's achievement level in comparison with students throughout the country.

Specific Program Requirements

- All mathematics majors must complete the mathematics core curriculum: MATH 126 CALCULUS AND ANALYTIC GEOMETRY I (5.00 c.h.), MATH 224 CALCULUS AND ANALYTIC GEOMETRY II (5.00 c.h.), MATH 307 INTRODUCTION TO LINEAR ALGEBRA (4.00 c.h.), MATH 325 INTERMEDIATE CALCULUS (4.0 c.h.), MATH 350 PROBABILITY (3.00 c.h.), MATH 421 INTRODUCTION TO ANALYSIS (4.00 c.h.), and MATH 427 ABSTRACT ALGEBRA (4.00 c.h.). Majors

are expected to complete core courses numbered above MATH 325 INTERMEDIATE CALCULUS (4.0 c.h.) at CSU Pueblo.
- All majors must complete a physics course numbered 200 or above.
- Mathematics majors and minors must complete the mathematics courses in their program with grades of C or better.
- MATH 337 DIFFERENTIAL EQUATIONS I (3.00 c.h.) is a required elective for all mathematics majors not pursuing secondary education concentration.
- All majors are required to complete an approved two-term sequence in a laboratory science (CHEM 121 GENERAL CHEMISTRY I (4.0 c.h.)/CHEM 121L GENERAL CHEMISTRY LAB I (1.00 c.h.) and CHEM 122 GENERAL CHEMISTRY II (4.00 c.h.)/CHEM 122L GENERAL CHEMISTRY LAB II (1.00 c.h.), or PHYS 221 GENERAL PHYSICS I (4.00 c.h.)/PHYS 221L GENERAL PHYSICS I LAB (1.00 c.h.) and PHYS 222 GENERAL PHYSICS II (4.00 c.h.)/PHYS 222L GENERAL PHYSICS II LAB (1.00 c.h.)).
- Mathematics majors must demonstrate proficiency in "an approved" computer language. It is strongly recommended that students complete this requirement within the first 60 credit hours.

Course	Title	Credits
MATH Courses		
MATH 126	CALCULUS AND ANALYTIC GEOMETRY I	5
MATH 224	CALCULUS AND ANALYTIC GEOMETRY II	5
MATH 307	INTRODUCTION TO LINEAR ALGEBRA	4
MATH 319	NUMBER THEORY	3
MATH 325	INTERMEDIATE CALCULUS	4
MATH 330	INTRODUCTION TO HIGHER GEOMETRY	3
MATH 350	PROBABILITY	3
MATH 356	STATISTICS FOR ENGINEERS AND SCIENTISTS	3
MATH 421	INTRODUCTION TO ANALYSIS	4
MATH 427	ABSTRACT ALGEBRA	4
MATH 463	HISTORY OF MATHEMATICS	3
MATH 477	METHODS FOR TEACHING SECONDARY MATH	4
Education Minor		**33**
Laboratory Science Sequence		**10**
Computer Programming		**4**
Electives		**7**
General Education		**21**
Total Credits		120

[1]   Excluding MATH 360 ELEMENTARY MATHEMATICS CONCEPTS I (3.00 c.h.), MATH 361 ELEMENTARY MATHEMATICS CONCEPTS II (3.00 c.h.), MATH 477 METHODS FOR TEACHING SECONDARY MATH (4.00 c.h.).

Specific Requirements for Secondary & K-12 Education/Minor

The student must complete an appropriate major and the following Education courses:

Course	Title	Credits
Select one of the following:		
PSYC 151	HUMAN DEVELOPMENT [1]	3
or PSYC 251	CHILDHOOD AND ADOLESCENCE	
or PSYC 342	EDUCATIONAL PSYCHOLOGY	

ED 202	FOUNDATIONS OF EDUCATION	3
ED 280	EDUCATIONAL MEDIA AND TECHNOLOGY [2]	3
ED 301	FRAMEWORKS OF TEACHING (Admission to Education is completed in this course)	4
RDG 435	CONTENT AREA LITERACY [3, 5]	4
Special Methods in Education Areas (Prerequisites - Admission to Education) [5, 6]		4
ED 412	TEACHING DIVERSE LEARNERS [4, 5]	3
ED 485	CAPSTONE SEMINAR IN EDUCATION	1
ED 488	STUDENT TEACHING SECONDARY	12
or ED 489	STUDENT TEACHING K-12	
Total Credits [3]		37-40

[1]   Music students may take PSYC 151 HUMAN DEVELOPMENT (3.0 c.h.) or PSYC 251 CHILDHOOD AND ADOLESCENCE (3.0 c.h.).

[2]   Music Education students may complete MUS 103 MUSIC AND COMPUTER TECHNOLOGY I (1.00 c.h.) and MUS 306 TECHNOLOGY FOR MUSIC EDUCATORS (2.00 c.h.) for ED 280 EDUCATIONAL MEDIA AND TECHNOLOGY (3.00 c.h.).

[3]   English/Language Arts student must also complete RDG 355 LINGUISTICS FOR EDUCATORS (3.0 c.h.)

[4]   Physical Education students may complete EPER 465 ADAPTED PHYSICAL EDUCATION (3.0 c.h.) or ED 412 TEACHING DIVERSE LEARNERS (3.00 c.h.).

[5]   GPA of 2.6 required

[6]   English/Language Arts student must also complete ED 447 TEACHING ENGLISH IN SECONDARY SCHOOLS (4.00 c.h.)

Planning Sheet

Disclaimer: The Planning Sheet is designed as a guide for student's planning their course selections. The information on this page provides only a suggested schedule. Actual course selections should be made with the advice and consent of an academic advisor. While accurately portraying the information contained in the college catalog, this form is not considered a legal substitute for that document. Students should become familiar with the catalog in effect at the time in which they entered the institution.

Note: Students completing a major with a concentration in Secondary Education are required to complete a minor in Education and to meet all other requirements outlined by the Teacher Education Program.

*COMR 103 is required for admission into the Teacher Education Program.

Course	Title	Credits
Year 1		
Fall		
ED 202	Foundations of Education	3
ENG 101	Rhetoric & Writing I (GT-CO1)	3
MATH 126	Calculus and Analytic Geometry I (GT-MA1)	5
PHYS 201	Principles of Physics I (GT-SC2)	3
PHYS 201L	Principles of Physics Lab I (GT-SC1)	1
	Credits	15
Spring		
ENG 102	Rhetoric & Writing II (GT-CO2)	3
MATH 224	Calculus and Analytic Geometry II	5
PHYS 221 or CHEM 121	General Physics I (GT-SC2) or General Chemistry I (GT-SC2)	4
PHYS 221L or CHEM 121L	General Physics I Lab (GT-SC1) or General Chemistry Lab I (GT-SC1)	1
General Education Must be World Language course.		3
	Credits	16
Year 2		
Fall		
ED 280	Educational Media and Technology	3
MATH 319	Number Theory	3
MATH 325	Intermediate Calculus	4
PHYS 222 or CHEM 122	General Physics II (GT-SC2) or General Chemistry II (GT-SC2)	4
PHYS 222L or CHEM 122L	General Physics II Lab (GT-SC1) or General Chemistry Lab II (GT-SC1)	1
	Credits	15
Spring		
COMR 103	Speaking and Listening (*)	3
MATH 307	Introduction to Linear Algebra	4
MATH 242	Introduction to Computation	4
MATH 330	Introduction to Higher Geometry	3
PSYC 151 or PSYC 251	Human Development (GT-SS3) or Childhood and Adolescence	3
	Credits	17
Year 3		
Fall		
ED 301	Frameworks of Teaching	4
MATH 477 or MATH 463	Methods for Teaching Secondary Math or History of Mathematics	3-4
MATH 350	Probability	3
General Education 3 credits must be World Language course.		6
	Credits	16-17
Spring		
ED 412	Teaching Diverse Learners	3
MATH 356	Statistics for Engineers and Scientists	3
MATH 427	Abstract Algebra	4
General Education		3
	Credits	13
Year 4		
Fall		
MATH 421	Introduction to Analysis	4
MATH 477 or MATH 463	Methods for Teaching Secondary Math or History of Mathematics	3-4
RDG 435	Content Area Literacy	4
Elective		3
	Credits	14-15
Spring		
ED 485	Capstone Seminar in Education	1
ED 488 or ED 489	Student Teaching Secondary or Student Teaching K-12	12
	Credits	13
	Total Credits	119-121