MATHEMATICS MS

Mathematics is the language for understanding patterns and developing abstractions. It is the science of number, structure, shape, and change. Practitioners learn to think analytically and critically, and to formulate and solve problems. The role of mathematics is vital and growing, providing solutions to problems in a wide range of disciplines including physics, chemistry, biology, engineering, computer science, and economics.

The Master of Science in Mathematics is designed for students with a background in a STEM discipline who wish to obtain desirable quantitative jobs in industry or government, teach mathematics at a community college, or enter a PhD program in pure or applied mathematics (or another STEM discipline). This program is a modern twist on the traditional degree with a blend of pure and applied topics and includes Python programming, a valuable skill in today's job market.

This is also an ideal program for returning students who want to learn new skill sets and make their resume look more attractive to employers, as well as high school math teachers who want to transition to community college.

Students improve their ability to think abstractly, solve complex problems, and some courses involve a Python programming component. The program is sufficiently flexible to allow students to emphasize their desired blend of pure, applied, statistical, or computational topics, depending on their background and interest.

Students may either pursue the thesis option, involving working on a research project and writing a master's thesis under the supervision of a faculty member, or the non-thesis option, which involves additional coursework and a comprehensive exam. In either case, graduates obtain an advanced understanding of abstract thinking, complex problem-solving, and computational techniques, positioning them for success in their chosen career paths.

Requirements for the MS in Mathematics

Completion of all requirements as established by the departmental graduate committee, the Graduate Advisory Committee, and Graduate Studies to include:

1. Completion of an approved program consisting of 32-35 units of coursework. At least 60% of the units required for the degree must be in 600-level courses.
2. Completion of a culminating activity. Students choose between a thesis or non-thesis option.
    a. In the **thesis** option, students work closely with faculty mentors to undertake independent research and complete a master's thesis. This track is highly recommended for those considering pursuing a PhD program or seeking research-focused careers. Students take two semesters of MATH 699T Master's Thesis.
    b. The **non-thesis** option is designed for students who want to strengthen their theoretical and practical skills in mathematics without undertaking a research project. Students take an additional 600-level course and MATH 696 Comprehensive Exam.
3. Approval by the departmental graduate committee and the Graduate Council on behalf of the faculty of the University.

Course	Title	Units
MATH 621	Real Analysis	4
MATH 622	Applied and Computational Algebra	4
Select two of the following:		6-8
CSCI 611	Applied Machine Learning	
CSCI 612	Applied Computer Vision	
CSCI 651	Applied Graph Theory	
MATH 641	Combinatorics and Graph Theory	
MATH 642	Computational Number Theory	
MATH 643	Stochastic Processes	
MATH 644	Partial Differential Equations	
MATH 690	Advanced Topics in Mathematics	
Select four of the following:		12
CSCI 580	Artificial Intelligence	
CSCI 581	Machine Learning	
MATH 421	Advanced Calculus	
MATH 435	Linear Algebra	
MATH 437	Topology	
MATH 450	Computational Statistics	
MATH 451	Modern Algebra II	
MATH 456	Applied Statistical Methods II	
MATH 458	Sampling Methods	
MATH 461	Numerical Analysis	
MATH 465	Introduction to Complex Variables	
MATH 472	Introduction to Chaotic Dynamical Systems	
MATH 475	Calculus of Variations	
MATH 480	Mathematical Modeling	
MATH 485	Advanced Topics in Data Science	
Select one of the following culminating activities:		6-7
Thesis: Complete six units of MATH 699T.		
Non-Thesis: Complete three units of MATH 696 as well as three to four units from any 600-level course not already taken.		
Total Units		**32-35**

Graduate Grading Requirements

All courses in the major (with the exceptions of Comprehensive Examination - 696, Independent Study - 697, Master's Project - 699P, and Master's Thesis - 699T) must be taken for a letter grade, except those courses specified by the department as ABC/No Credit (400/500-level courses), AB/No Credit (600-level courses), or Credit/No Credit grading only. A maximum of 10 units combined of ABC/No Credit, AB/No Credit, and Credit/No Credit grades may be used on the approved program (including 696, 697, 699P, 699T and courses outside the major). While grading standards are determined by individual programs and instructors, it is also the policy of the University that unsatisfactory grades may be given when work fails to reflect achievement of the high standards, including high writing standards, expected of students pursuing graduate study.

Students must maintain a minimum 3.0 grade point average in each of the following three categories: all coursework taken at any accredited institution subsequent to admission to the master's program; all coursework taken at Chico State subsequent to admission to the program; and all courses in the approved master's degree program. Failure to maintain a 3.0 average in any category will result in academic notice in the master's program. Failure to remedy the deficiency within

one semester with appropriate courses approved by the program coordinator may result in disqualification from the master's program. See Graduate Education Policies (https://catalog.csuchico.edu/graduate-requirements/graduate-education-policies/#academicstanding) for more information.

Continuous enrollment is required. At the discretion of the academic program, a maximum of 30 percent of the units counted toward the degree requirements may be special session credit earned in non-matriculated status combined with all transfer coursework. This applies to special session credit earned through Open University, or in courses offered for academic credit through Professional & Continuing Education. Correspondence courses and UC Extension coursework are not acceptable for transfer.

Graduate Time Limit

All requirements for the degree are to be completed within five years of the end of the semester of enrollment in the oldest course applied toward the degree. See Master's Degree Requirements (https://catalog.csuchico.edu/graduate-requirements/masters-degree-requirements/) for complete details on general degree requirements.

Graduate Requirement in Writing Proficiency

All students must demonstrate competency in writing skills as a requirement for graduation. Mathematics students will demonstrate their writing competence through successful completion of MATH 696 Comprehensive Exam or MATH 699T Master's Thesis.

Admission Requirements

To be admitted, students must hold an acceptable baccalaureate from an accredited institution (or an equivalent approved by Graduate Studies), or be pursuing a BS degree in a STEM discipline, and have taken at least one course in each of calculus, linear algebra, computer programming, proofs/discrete math, real analysis/advanced calculus, modern algebra. A second course in computer programming is recommended but not required.

Equivalent prerequisite courses at Chico State:

Course	Title	Units
CSCI 111	Programming and Algorithms I	4
CSCI 211	Programming and Algorithms II	4
MATH 120	Analytic Geometry and Calculus	4
MATH 217	Discrete Mathematics	3
or MATH 330W	Methods of Proof (W)	
MATH 235	Elementary Linear Algebra	3
MATH 420W	Advanced Calculus (W)	3
MATH 449	Modern Algebra	3

Students who have not taken real analysis or modern algebra may still be conditionally admitted to the program, provided these undergraduate courses are completed within the first year. No credit will be given toward the MS for MATH 420W or MATH 449.

Additional Requirements

1. A minimum 2.5 GPA
2. Two letters of recommendation
3. A statement of purpose

Definition of Blended Programs

A blended bachelor's and master's degree program combines an existing Chico State bachelor's degree with an existing Chico State master's degree; the blended program allows up to 12 units of the graduate program units to be double-counted at the undergraduate level, for a minimum of 138 units to receive both degrees. Students who complete a blended program will receive both a bachelor's and master's degree. Upon completion of 120 semester units and with the completion of all requirements for the bachelor's degree, students in blended programs will be awarded the bachelor's degree. Upon completion of the requirements for the master's degree, students will be awarded the master's degree.

Students interested in applying to a blended program must be enrolled in a bachelor's degree program at Chico State and must meet and maintain the minimum GPA of the existing master's degree entrance requirements for all bachelor's coursework completed at the time of the application to the blended program, or show promise to reach this level as determined by the program. Once admitted to the blended program, students shall not be required to apply for admission to the master's program.

Blended BS + MS in Mathematics

Eligibility

The blended BS + MS is for highly motivated, well-qualified students. The program allows a student to apply after completing at least 60 units toward their bachelor's degree with a minimum GPA of 2.5.

Application Procedure

Application deadlines: April 1 for fall start, November 1 for spring start.

Students who meet the eligibility criteria may submit an application for admission to the blended program (https://csuchico.my.site.com/BlendedProgram/s/). Formal application through Cal State Apply is not necessary and the student is not required to pay an application fee. GRE scores are not required. Students must meet the requirements outlined below to change to blended graduate status and continue toward the master's degree.

Grading Requirement

Once in the blended program, students must maintain a minimum 3.0 GPA during their remaining undergraduate and graduate semesters.

Transition to Graduate Status

Students can transition to the graduate program after completing all undergraduate degree requirements with a minimum 2.5 GPA in all coursework. The Office of Graduate Studies and the Graduate Coordinator will verify graduate program eligibility at the end of the semester in which the bachelor's degree is completed. Qualified students change to graduate status effective the following semester.

Requirements for the Blended BS + MS

The blended program allows 12 units from the courses below to be counted toward both degrees.

Course	Title	Units
CSCI 580	Artificial Intelligence	3
CSCI 581	Machine Learning	3
MATH 421	Advanced Calculus	3
MATH 435	Linear Algebra	3
MATH 437	Topology	3
MATH 450	Computational Statistics	3
MATH 451	Modern Algebra II	3
MATH 456	Applied Statistical Methods II	3
MATH 458	Sampling Methods	3
MATH 461	Numerical Analysis	3
MATH 465	Introduction to Complex Variables	3
MATH 472	Introduction to Chaotic Dynamical Systems	3
MATH 475	Calculus of Variations	3
MATH 480	Mathematical Modeling	3
MATH 485	Advanced Topics in Data Science	3