

**Master of Science in Computational and
Applied Mathematics**

(This elevation was approved by the CSULB Academic Senate on March 9, 2023, approved by the President on March 15, 2023, and the CSU Chancellor's Office on May 18, 2023.)

Previous Option Title: MS in Mathematics, Option in Applied Mathematics

Computational and Applied Mathematics, M.S. (30 units)

The Master of Science in Computational and Applied Mathematics provides a thorough program in the theory and use of advanced computational and applied mathematics that will prepare students to successfully model and solve mathematical and computational problems arising in the real world. The degree is granted to students who successfully complete 30 units of course work and either pass two comprehensive examinations or fulfill the thesis/project requirement.

Prerequisites

A bachelor's degree in mathematics, physics, or engineering, or a bachelor's degree with at least 24 upper division units in mathematics from an accredited college or university.

A grade of "C" or better in the following courses:

Deficiencies will be determined by the Graduate Advisor.

- MATH 247 - Introduction to Linear Algebra (3 units)
- MATH 323 - Introduction to Numerical Analysis (4 units)
- MATH 361A - Introduction to Mathematical Analysis I (3 units)
- MATH 361B - Introduction to Mathematical Analysis II (3 units)
- MATH 364A - Ordinary Differential Equations I (3 units)
- MATH 380 - Probability and Statistics (3 units)
- or their equivalents

Advancement to Candidacy

In addition to University requirements, a student must have completed all prerequisite courses listed above, with no grade less than "C". Students should file for Advancement upon successful completion of at least six units of approved program courses, with at least a 3.0 GPA. Program of study must be approved by the appropriate Graduate Advisor and the Director of Graduate Studies in the College of Natural Sciences and Mathematics (or designee).

Requirements

A minimum of 30 graduate and upper division units

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Three of the following courses:

- MATH 563 - Applied Analysis (3 units)
- MATH 570 - Partial Differential Equations (3 units)
- MATH 576 - Numerical Analysis (3 units)
- MATH 579 - Advanced Mathematical Modeling (3 units)

Three additional courses selected from the following courses:

- MATH 520 - Finite Element Method (3 units)
- MATH 521 - Matrix Method in Data Analysis and Pattern Recognition (3 units)
- MATH 564 - Applied Nonlinear Ordinary Differential Equations (3 units)
- MATH 573 - Advanced Scientific Computing (3 units)
- MATH 574 - Stochastic Calculus and Applications (3 units)
- MATH 575 - Calculus of Variations (3 units)
- MATH 577 - Numerical Solution of Partial Differential Equations (3 units)
- MATH 578 - Numerical Linear Algebra (3 units)
- and the course in the previous section not used to satisfy that requirement.

Complete one of the following culminating activities

Comprehensive written examination

Pass a comprehensive written examination in two subjects of Applied Mathematics. Specific requirements for passing of the comprehensive examinations can be found on [the Department of Mathematics and Statistics](#) website.

Thesis

Subject to the approval of the Applied Mathematics Committee in the Department of Mathematics and Statistics, write a thesis in computational or applied mathematics and defend it orally. Specific requirements for the thesis proposal approval process can be found on the [department](#) website. This choice of culminating activity requires students to enroll in at least 3 and at most 6 units of MATH 698.

Project

Subject to the approval of the Applied Mathematics Committee in the Department of Mathematics and Statistics, complete a non-proprietary applied mathematics project with a local company under the guidance of a faculty advisor in computational or applied mathematics and a project leader from the company. Write a final report on the project and its outcomes and defend it orally. Specific requirements for completion of the project can be found on [the Department of Mathematics and Statistics website](#). This choice of culminating activity requires students to enroll in at least 3 and at

most 6 units of MATH 698.

EFFECTIVE: Fall 2024

Academic Plan Code: MATHMS02PB

Career: Graduate

CIP: 27.0304

CSU Code: 17033

Concentration Code: 01

College: 65, Natural Science and Mathematics

Department: Mathematics and Statistics

Delivery: Face-to-Face

STEM Eligible