

Undergraduate Minor Computational and Applied Mathematics Rice University

Skills in computational and applied mathematics prove invaluable to every quantitative discipline. Many students would benefit from a richer foundation in applied mathematics than is obliged by the basic requirements of their major. To encourage such students to further their studies, the CAAM department has created an undergraduate minor.

The CAAM minor will provide a core of knowledge in our discipline, while allowing students sufficient flexibility to tailor the curriculum to complement their major interests. All students will take courses in basic mathematical modeling and computing (CAAM 210) and linear algebra (CAAM 335), along with a course in either partial differential equations (CAAM 336) or optimization/operations research (CAAM 378). Students then will select three more courses that could, for example, focus on computational science and engineering, differential equations, or optimization; see the samples below. We anticipate that this program of study will particularly appeal to students majoring in engineering, natural sciences, and economics.

More specifically: to obtain a CAAM minor, students must complete at least 18 credit hours in the CAAM department, including:

- (1) CAAM 210 Introduction to Engineering Computation
- (2) CAAM 335 Matrix Analysis
- (3) CAAM 336 Differential Equations in Science and Engineering
or CAAM 378 Introduction to Operations Research and Optimization
- (4) Three additional 3-credit CAAM classes, at least two of which
must be at the 400 level or above.

Several sample programs of study follow below. These are only suggestions; students are encouraged to consult with a CAAM undergraduate advisor to best tailor a program that meets their interests.

Computational Science and Engineering

CAAM 210	Introduction to Engineering Computation
CAAM 335	Matrix Analysis
CAAM 336	Differential Equations in Science and Engineering
CAAM 353	Computational Numerical Analysis
CAAM 420	Computational Science I
CAAM 520	Computational Science II

Differential Equations

CAAM 210	Introduction to Engineering Computation
CAAM 335	Matrix Analysis
CAAM 336	Differential Equations in Science and Engineering
CAAM 353	Computational Numerical Analysis
CAAM 415	Theoretical Neuroscience
<i>or</i> CAAM 423	Partial Differential Equations I
CAAM 452	Numerical Methods for Partial Differential Equations

Optimization

CAAM 210	Introduction to Engineering Computation
CAAM 335	Matrix Analysis
CAAM 378	Introduction to Operations Research and Optimization
CAAM 470	Introduction to Graph Theory
CAAM 471	Introduction to Linear and Integer Programming
CAAM 474	Combinatorial Optimization