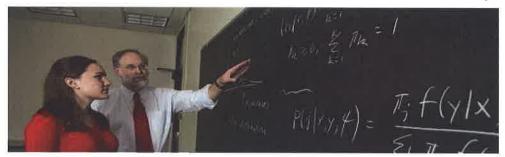# Bachelor of Science in

# Applied and Computational Mathematics and Statistics (ACMS)



The partnership of applied mathematics, computational mathematics, and statistics brings the tools of modeling, simulation, and data analysis to bear on real-world problems, producing solutions with the power to predict and explain complex phenomena. These methods, often applied computationally, are being used in a wide variety of areas in business, engineering, the natural sciences, and the social sciences.

The Department of Applied and Computational Mathematics and Statistics (ACMS) offers programs of study leading to the **bachelor of science degree in applied and computational mathematics and statistics**. Computational skills, which are often required to solve real-world problems, will be developed throughout the curriculum. For many students, significant work in an area of application will complement their core studies. Graduates of the program will be well prepared for the following post-graduate opportunities:

* Graduate study, at the masters or doctoral level, in bioinformatics or computational biology;
* Employment and further study in quantitative methods in business, economics, and actuarial science;
* Further training in masters or doctoral programs in applied mathematics or statistics;
* Employment in technical fields requiring skills in statistics and computation.

In addition to the core bachelor of science major, ACMS offers a concentration in biological sciences, which will prepare students for further study or employment in bioinformatics, computational biology, ecological modeling, or epidemiology.

**Bachelor of Science with a Major in Applied and Computational Mathematics and Statistics.** The requirements for the degree include courses that develop a strong foundation in the methods of applied mathematics and data analysis, while allowing students to also take courses in a wide variety of application areas. The specific requirements for the bachelor of science in applied and computational mathematics and statistics, beyond the university and college requirements are as follows.

**Requirements for the B.S. in ACMS:**
Chemistry (CHEM 10171, 10122 or CHEM 10171, 10172)
Physics (PHYS 10310, 10320)
Calculus I, II (MATH 10550, 10560)
Introduction to Applied Mathematics Methods I, II (ACMS 20550, 20750)
Scientific Computing (ACMS 20210)
Applied Linear Algebra (ACMS 20620)
Introduction to Probability (ACMS 30530)
Statistical Methods & Data Analysis I (ACMS 30600)}
Mathematical/Comp Modeling (ACMS 40730)
Numerical Analysis (ACMS 40390)
ACMS Electives (6 credits in ACMS courses numbered 30000 and above)
MATH or ACMS Elective (3 credits in MATH or ACMS courses numbered 30000 or above)
Science Elective (3 credits)

These requirements total 42 credits in ACMS and MATH and 60 credits in Science.

**Supplementary Major in Applied and Computational Mathematics and Statistics.** Students in numerous areas of study can benefit from advanced study in applied and computational mathematics and statistics. This is true for students in business and the social sciences as well as those in the natural sciences and engineering. This supplementary major is well suited for these students.

**Requirements for the Supplementary Major in Applied and Computational Mathematics and Statistics.** The supplementary major in applied and computational mathematics and statistics requires 36 credits in ACMS and Mathematics. The specific requirements are as follows.

Calculus I, II (MATH 10550, 10560)
Introduction to Applied Mathematical Methods, I, II (ACMS 20550, 20750)
Scientific Computing (ACMS 20210)
Applied Linear Algebra (ACMS 20620)
Introduction to Probability (ACMS 30530)
Statistical Methods & Data Analysis I (ACMS 30600)}
Mathematical/Comp Modeling (ACMS 40730)
Numerical Analysis (ACMS 40390)
ACMS electives (3 credits in ACMS courses numbered 30000 and above, except those overlapping in content with one of the above)

*Difference from the full major.* The supplementary major in ACMS requires 36 credits in ACMS and Mathematics, 6 fewer of electives than the full ACMS major.

For additional information about the major in ACMS, please visit our website at http://acms.nd.edu/ or contact us at acms@nd.edu.