The Art & Science of Mathematical Modeling (3 credits)

This course will introduce students to fundamental concepts and methods of mathematical modeling, with emphasis on interdisciplinary problem-solving. Math models are used to describe and analyze a wide variety of real-world phenomena, ranging from common everyday events (synchronizing traffic-light timings), to highly complex systems (ocean-atmosphere-landmass interactions for climate modeling), to hypothetical scenarios (tumor growth & treatment strategies). A key goal of the course is to help students integrate and extend familiar mathematical tools and techniques in new and creative ways, resulting in a powerful framework for design and analysis applicable to a wide range of disciplines. Topics include discrete and continuous dynamical systems; proportionality and geometric similarity models; fitting models to data; simulations; probabilistic modeling; discrete optimization and linear programming.

Credits 3
Attributes
Natural Sciences Division
Upper-Level