

Meeting: 1003, Atlanta, Georgia, SIAMMINI1, SIAM Minisymposium on Undergraduate Linear Algebra and Differential Equations: Projects, Problems, and Issues

1003-34-1317 **Angela Shiflet*** (shifletab@wofford.edu), Wofford College, 429 N. Church St., Spartanburg, SC 29303. *Differential Equations Applications for Freshmen and Sophomore Science Majors.*

Modeling with differential equations (DEs) is well within the grasp of lower-level undergraduate science majors who have had little or no calculus. With basic knowledge about the concept of "rate of change," students can learn to develop models involving systems of DEs using the dynamic systems modeling tool STELLA. This tool enables a user to create a diagram of components and relationships, including constants and equations, for complex systems. With no programming experience, students can perform computer simulations for these models and view results as tables and graphs. This approach is incorporated in the course Modeling and Simulation, which is a requirement of Wofford College's Emphasis in Computational Science, a program for interested science and mathematics majors. Some of the applications include radioactive chains, population growth, rocket motion, competition, spread of disease, enzyme kinetics, predator-prey, metabolism, economics of fishing, global warming, scuba diving, and electrical circuits. With a STELLA basis, students also examine numerical methods for solving ordinary differential equations. This talk discusses the approach in the Modeling and Simulation course and includes a demonstration of STELLA with some of the course's applications. (Received October 04, 2004)