

## **Functions and Modeling**

Functions and Modeling is a requirement for math majors in the FSU-Teach program. In this exploration of secondary mathematics concepts, prospective mathematics teachers are expected to do the following:

- Deepen and broaden function-related mathematical content knowledge from algebra through calculus
- Make connections between college mathematics and secondary school mathematics
- Build preliminary knowledge of professional and state mathematics curriculum standards
- Use reflective and collaborative learning and develop a stronger sense of professionalism and leadership
- Become efficient seekers and presenters of mathematics content knowledge and history
- Explore and learn appropriate use of technology in the mathematics classroom

A point is made to cover content that is traditionally glossed over by secondary teachers but is essential to preparing students for university mathematics courses. This slighted content includes parametric and polar objectives, linear and matrix algebra, regression aspects of statistics, and growth and decay exponential models.

### **Course Procedures: Functions and Modeling**

Functions and Modeling asks students to view mathematics differently than they have in the past: Students are consistently encouraged to make conceptual connections within the curriculum and to justify the reasons their methods of solution work in context. This method is initially very challenging to students at this level, regardless of their competence in mathematics. However, eventually, students see how mathematical concepts can be taught in a way that enables the learner to develop a rich understanding of the material. This course also gives students a chance to investigate concepts further and encourages independent learning and leadership. Much of what is taught exposes the students to different ways of thinking and problem solving.

There is purposely no textbook for this course. Many handouts are prepared and given to students, but, due to the discovery and problem-solving aspects of the course, no preconceived (back-of-the-book) solutions should be available to students. Students are strongly encouraged to seek additional background information on their own if they are deficient in certain areas of mathematics. This guideline is designed in an attempt to instill the practice of lifelong learning into their perception of what it is to teach mathematics.

## Course Objectives: Functions and Modeling

### Students Will Be Able To:

Deepen and broaden function-related mathematical content knowledge

Generate relevant data and use regression, matrix, function pattern, and systems methods to model the data

Present mathematics ideas and topics in a knowledgeable and effective manner

Explore and learn appropriate use of technology in the mathematics classroom

Identify connections between the various levels of secondary mathematics curriculum and between secondary and university level curriculum

### Evidence (Student Products)

Classroom activities  
Assessments  
Discussions

Classroom activities  
Classroom labs

Classroom presentations of findings  
Discussions

Classroom activities  
Classroom labs  
Assessments  
Discussions

Classroom activities  
Discussions