

SAT-S77 / Ohio, Level 2 / 10:30 AM–11:15 AM

Free Calculus: Creating a Mathematics Course with Free Software

Scott Randby, University of Akron

A detailed description of a web-enhanced calculus course developed using free software will be given in this session. Free software principles, the software used in the course, the development and usage of course materials, and an outcome-based analysis of the effectiveness of the course will be presented.

TRACK: CALCULUS

SAT-S78 / Mississippi, Level 2 / 10:30 AM–11:15 AM

Exploring Number Theory with Various Computer Algebra Systems

Michael McConnell, Clarion University

Many number theory topics lend themselves to CAS exploration. We will look at the Euler Phi Function, RSA Encryption, and fractions in other bases.

TRACK: BEYOND CALCULUS

SAT-S79 / Arkansas, Level 2 / 10:30 AM–11:15 AM

Online Assessment with Maple TA: Sharing an Experience in Algebra

Ana Guadalupe Del Castillo and Blanca Evelia Flores, Universidad de Sonora

The aim of this session is to share some results related to the design and implementation of online assignments with Maple TA, in the courses of algebra for engineering students of the University of Sonora.

TRACK: PEDAGOGY, RESEARCH & ASSESSMENT

SAT-S80 / Colorado, Level 2 / 10:30 AM–11:15 AM

Military Applications, Part 3

Mike Jaye, Naval Postgraduate School, and Richard Marchand, Slippery Rock University

A Dynamical Systems Model of Information Operation Effects

Mike Jaye, Naval Postgraduate School

The presentation uses technology (Excel, Maple) and dynamical system modeling of probabilistic behavior. This problem is important to counter-insurgency operations where force alone might not prevail—hence the need to better understand “soft” operations (civil support, psychological operations). Modeling is done using a system of difference equations; several transmission distributions, including time-dependent distributions, are considered and discussed. We investigate several transmission distributions and use Excel to implement the model. This model and its implementation form the capstone project for a course in mathematical modeling using probability and statistics.

Estimating Small-diameter Rocket Trajectories

Richard Marchand, Slippery Rock University

The goal of this project is to estimate the trajectory of a rocket based on simulated sensor measurements (three accelerometers and three gyroscopes). The sensor data is provided at one millisecond intervals for the first five seconds of flight. The derivation of the governing nonlinear system of differential equations is provided, along with a numerical approximation of the trajectory. The project provides a nice blend of mathematical modeling, differential equations, and linear algebra.

TRACK: REAL-WORLD APPLICATIONS

SAT-S81 / Sheraton 1, Level 4 / 11:30 AM–12:15 PM

One Year Later: Embracing the iPhone in College Mathematics

John Ehrke, Abilene Christian University

In the fall of 2008, ACU distributed Apple iPhones to incoming freshmen. Now, one year later, we look to build upon a year’s worth of experience. What have we learned? In this talk, we explore the iPhone as a platform for integrating learning and technology in undergraduate mathematics.

TRACK: EMERGING TECHNOLOGIES

SAT-S82 / Sheraton 2, Level 4 / 11:30 AM–12:15 PM

Custom Publishing Helps Department Chair Meet Challenges of Course Redesign and Finding High-quality, Affordable Course Materials

Todd Troutman, Lansing Community College

Many department chairs and course coordinators find the persistent need to redesign courses a challenge. This task creates a strain on resources, pulling faculty and other academics away from their primary responsibilities and adding one more thing to a growing “to-do” list. In this session, the presenter will share his personal experience of how his department redesigned their math courses using customized course materials, thereby creating a longer-term solution for course redesign.

TRACK: TEACHING MATH ONLINE

SAT-S83 / Chicago 10, Level 4 / 11:30 AM–12:15 PM

Teaching Conceptually Using WolframAlpha.com

Charles Emenaker, Cenalo Vaz, and Larry Waldrop, University of Cincinnati—Blue Ash

WolframAlpha.com is readily available on the Internet. Your students are sure to use it for algebra and calculus, so why not access WolframAlpha in your classes? Teaching methods that focus on conceptual underpinnings and projects that focus on the appropriate application of mathematical techniques will be presented in class-ready activities.

TRACK: BEFORE CALCULUS

SAT-S84 / Sheraton 3, Level 4 / 11:30 AM–12:15 PM

Enhancing Your WebCT Blackboard Assessments

Kudzai Zvoma, Quinebaug Valley Community College

This session will demonstrate how basic HTML can be used to help build more varied and effective math assessment questions with images, video, and some mathematical typesetting.

TRACK: DEVELOPMENTAL MATH

SAT-S85 / Ohio, Level 2 / 11:30 AM–12:15 PM

Creating ACR Documents with TI-Nspire and Maple

William Bauldry, Appalachian State University, and Wade Ellis, West Valley College

We will present the Action-Consequence-Reflection (ACR) paradigm. Examples of ACR documents, easy to make with TI-Nspire and Maple, are shown. Sample ACR documents will be chosen from topics relevant to precalculus through real analysis. The session ends with a discussion of classroom uses of ACR documents.

TRACK: CALCULUS
